Brain Trainer

Puzzles to Keep Your Mind Young and Agile

by William Armstrong

Author of *Perplexercises*

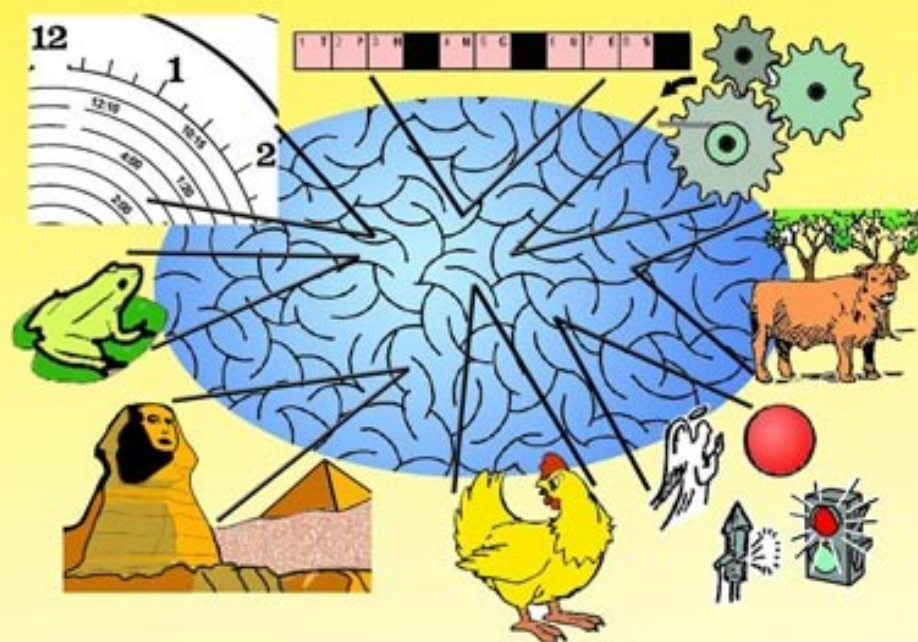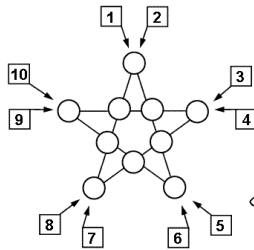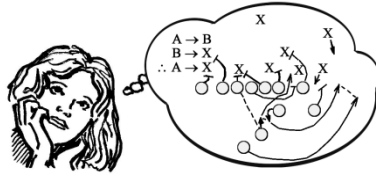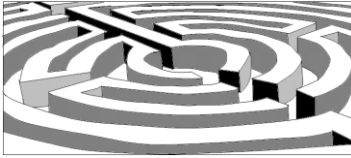# Brain Trainer

Puzzles to Keep Your Mind Young and Agile

I will not outshine the teacher.
I will not outshine the teach
I will not outshine the teach
I will not

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Orientation – Meet Your Personal Trainer

Like any other part of your body, your brain needs exercise to stay fit and agile. Puzzles provide a fun and fascinating workout for your mind. However, most puzzle books fail to explain how to exercise your gray matter; they ask you to bench press 400 pounds without any training or preparation. Think of this book as your personal puzzle trainer. It not only presents you with hundreds of enjoyable brain exercises, it also teaches you how to improve your skills so you can tackle the toughest challenges.

Each chapter covers a different puzzle genre, which acts as another piece of equipment in your "mental workout" gym. Some of the puzzles provide mind-stretching warm-ups, while others work specific skills like visualization or flexibility. The variety of different puzzle types will help you find the areas that you enjoy most. The training and repetitions will help you take on greater challenges as you gain strength.

Here's how I've organized each chapter:

A playful story launches each puzzle category. The stories generally put the topic into historical perspective, but they're also designed to evoke a laugh or two. In his book *A Whole New Mind*, Daniel Pink stresses how 'story' plays an important role in a healthy, creative mind.

He also emphasizes 'play' as another facet of our mental training. So I hope that the stories introduce each topic in an amusing way. If you don't share my sense of humor, feel free to skip to the meat of the chapter.

Next I define the puzzle category as briefly as I can and try to get you into some basic exercises right away. I find that I learn best through examples, so be prepared for lots of sample puzzles. I will try to explain how to approach each puzzle in enough detail so that you are not overwhelmed. If the first puzzles are too easy, rest assured that they get tougher as you go. By the end of each chapter you'll be faced with some daunting challenges. Even if you don't care for the most difficult problems, you might enjoy studying the answers that explain how each puzzle can be solved.

As we go step by step through the mental exercises, we'll build a list of puzzle-solving tips. If you ever get stumped, try applying some of these hints. Each chapter also presents a General Puzzle Principle that I hope will help you solve any puzzle. In this way, your "trainer" can help you develop an effective approach to all of the brain exercises you encounter. Here is one of the general principles to get you started:

General Puzzle Principle **Don't give up.** "Think positive." Assume you'll succeed. You are halfway to victory when you know that you <u>can</u> solve the puzzle. Solutions appear when you are confident that they will. Remember that it's not over until you win.

I explain each puzzle's answer in detail at the end of the book. My answers often include suggestions of how the puzzle exercises your neurons. Even if you solved the puzzle with ease, you may want to examine how I approached it; studying how other people overcome obstacles helps you collect a variety of tools for handling more difficult challenges.

At the end of each chapter I'll refer to a few books, magazines, and web sites where you can continue your training (and fun). This book is just the beginning of a life-long adventure. I hope it assists you in finding the types of puzzle that make it fun to exercise your brain. Ultimately, I want to encourage you to create your own puzzles for the rest of us to enjoy. Creating puzzles exercises your brain as much or more than solving them.

Here are some of the brain functions that the puzzles will be exercising. The icons are shorthand symbols that I'll display after each puzzle's title to suggest which functions that particular puzzle addresses. I only have room for two or three icons per puzzle, and some functions will depend on how you approach the problem.

Left Brain		*Right Brain*	
Logical/sequential	a→b	☁	Lateral/random
Rational	☑	∿	Intuitive
Objective	▦	♥	Subjective
Analysis	⊞	⇗⇙	Synthesis
Details	📄	⬆	Big picture
Exact calculations	=	≈	Quick approximations
Lists/Plans	📑	〰	Story/fantasy
Rules/Procedures	🔒	💡	Creative
Spelling/Vocabulary	cat	👁	Visualizing
Control	☸	⌘	Pattern Recognition
Language/verbal skills	📖	☯	Images/symbols

Full Brain Facilities

🐘 Memory/Recall

Focus/Attention 🔍

🕐 Speed/Quick Thinking

Association ∫

🎓 Learning/New Concepts

What Makes a Good Puzzle?

1. **A puzzle must be solvable.** There must be a way to figure out the answer. Ideally the solution should be clever and entertaining, but there absolutely must be an approach one can take to tackle the problem. Here's an example of an unfair question that doesn't meet my definition of a puzzle:

   > The word "committee" has three sets of double letters (m's, t's, and e's). What is another common word that has three sets of double letters *in a row* (with no intervening letters like the "i" in "committee")?

   There is no reasonable way to attack this problem except by searching the Internet for web sites that already know the answer. Just sitting down and trying to think up the answer is very unlikely to bear fruit. If you keep this question stashed in the back of your mind, you might someday stumble across *bookkeeper* and shout, "Eureka!" But if you consider questions like this to be *puzzles*, you're likely to be frustrated and not get a good mental exercise.

2. **A puzzle should be fair.** I use the term "tight" to refer to a puzzle that has a single answer that no one would debate. Some good, valid puzzles aren't 100% tight, but they should always be fair. The solver must have a fighting chance of success. I once read about a sequence "puzzle" that asked the solver to name the next number in a sequence. The sequence had a series of increasing numbers but no obvious pattern. The author said that the sequence represented street numbers of stations on a particular subway line in New York City. This question is unfair for about 99.999999% of the world's population. I'll try to avoid non-puzzles like this.

3. **A puzzle should be more work for the creator to create** than it is for the solver to solve. If an author uses a computer or a formula to generate puzzles, he should at least throw out the ones that aren't fun to solve. I expect the designer to add wit and intelligence to his creation. A brilliantly crafted puzzle is a thing of beauty, worthy of your mental gymnastics.

4. **The best puzzles have an "Aha!" moment.** When your brain performs that seemingly miraculous feat of putting all the pieces together, you feel a rush. A moment before, you may have been confused. But all at once the light bulb comes on and you have the answer. I hope to give you some of those precious moments as we exercise our brains.

General Bibliography

Games Magazine and *Games World of Puzzles*. These are the best continuing sources of puzzles in the known world.

Dudeney, Henry Ernest. <u>536 Puzzles & Curious Problems</u>. New York, Charles Scribner's Sons, 1967. Also available online at ebookee.org.

Loyd, Sam. <u>Cyclopedia of Puzzles</u>. New York, Lamb Publishing, 1914. (see www.mathpuzzle.com/loyd for full text)

Brecher, Edwin. <u>The Ultimate Book of Puzzles, Mathematical Diversions, and Brainteasers</u>. New York, St. Martin's Griffin, 1996.

Borgmann, Dimitri. <u>Language on Vacation</u>. New York, Scribner, 1965.

Pink, Daniel. <u>A Whole New Mind</u>. New York, Riverhead, 2005.

Some Noteworthy Web Sites

www.google.com – where to start looking for anything on the web

en.wikipedia.org– a wonderful, user-maintained encyclopedia and reference source (Wikipedia)

www.gutenberg.org – Project Gutenburg (USA) has complete texts of many public domain books

www.thefreedictionary.com – a great dictionary and thesaurus

www.dmoz.org/Games/Puzzles – dmoz open directory project is a gateway to worlds of great puzzles

www.lexfn.com – Lexical FreeNet connected thesaurus, a word association tool

www.rhymezone.com – RhymeZone, rhyming dictionary, etc.

www.braintrainerpuzzles.com – William Armstrong's companion web site for this book.
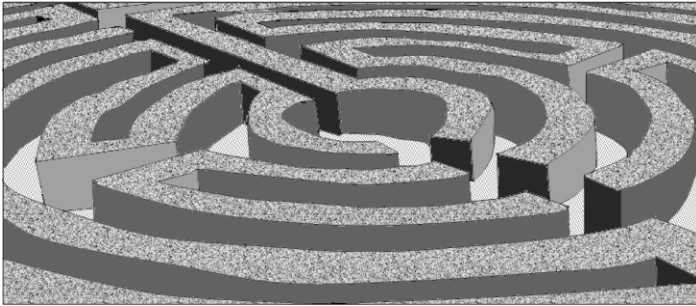
Chapter 1 – Mazes

As I said in the Orientation, you can skip the following story if you want to go straight to the puzzles. The story is presented as a humorous introduction to mazes. It is intended to show that mazes have fascinated mankind for millennia.

Story
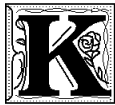
King Minos should not be confused with King Midas who died as a result of severe gilt feelings and too limited a diet (he was only allowed 24 carats a day). Minos, on the other hand, was Greek mythology's ruler of Crete. Now it turns out that a fugitive wise man named Daedalus had found his way into Minos's employ after slipping through an Athenian dragnet like a Greeced pig. The clever architect and inventor had impulsively pushed his promising pupil, Talos, a little too hard (over a cliff) and decided that the local Board of Education would frown on such an action.

King Minos, however, was delighted to offer Daedalus asylum in exchange for a little favor. Minos commissioned the architect to build a house for the king's pet monster, a beast who was half man and half bull. Perhaps a little more than half bull, if you ask me. Nevertheless Daedalus constructed a maze of corridors which (like the story) seemed to lead nowhere. The bewildering building became known as the Labyrinth, the prison home of the monstrous Minotaur. It was hopeless to attempt escape from the brilliantly designed maze. Even so, the Minotaur had no desire to leave the Labyrinth; human sacrifices wandered the endless passages until the resident beast decided it was dinnertime.

Finally, a Greek youth named Theseus decided to put an end to the Minotaur in the maze. Although the designer of the Labyrinth had

already flown the coop (or whatever it was they flew in those days), Theseus was able to enlist the help of Minos's daughter, Ariadne. Confident of the young man's ability to slay the evil Minotaur, Ariadne devised a method for her hero to escape the complicated hallways after accomplishing his dark deed. She gave Theseus a ball of thread to unwind as he entered the maze (even heroes like to unwind before a battle). The plan worked perfectly; the Minotaur's reign of terror was ended; and Theseus followed the thread to his sweetheart.

Warm-Up Exercises

Puzzle answers begin on page 187

Let's jump right into a puzzle.

1. ...Whose Fleas Were White As Snow
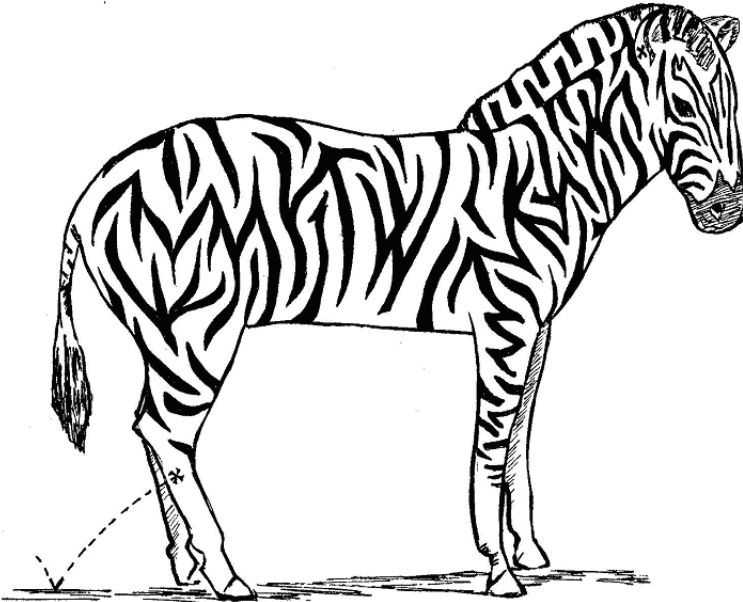
Help the albino tsetse fly walk from the zebra's hind leg (X) to its ear (another X) while staying only on the white areas.

You solved this simple example using your right-brain functions. The correct route took you to the base of the zebra's tail, down to the belly, and into the right foreleg and mane.

What Is a Maze?

Basically, a maze is a confused and twisting complex of corridors. It may be drawn out on a flat surface as a diagram seen from a bird's-eye view; or it may be constructed in three dimensions for a castle courtyard. Most often the serpentine passageways allow a choice of turns at several points. Mazes are usually designed with an entrance and an exit (sometimes the same door), although the goal may lie deep inside.

Mazes are visual puzzles that contain visual traps. They often provide images that draw your eye away from the correct path. The next example contains a confusion of arrows forming the walls of the maze. The arrowheads exist only to distract you from your course. They try to entice your subconscious mind to stray in the wrong direction.

2. An Arrow Escape
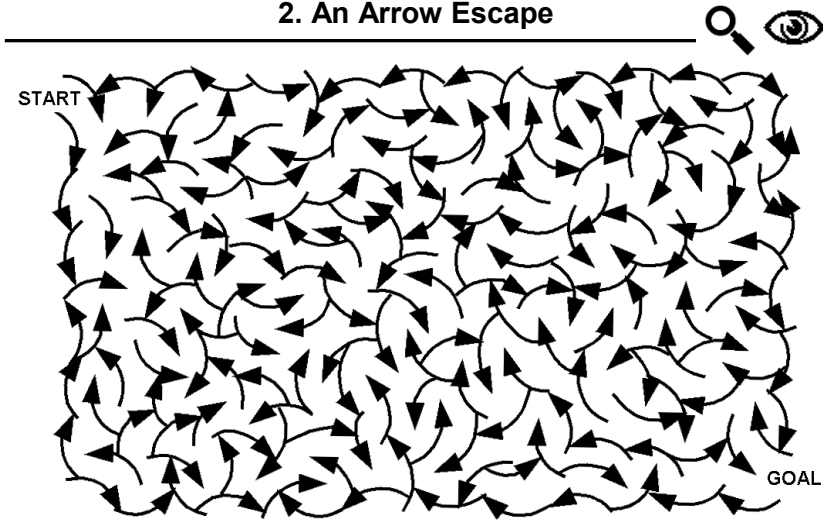
The answer (at the back of the book) not only maps a path through the maze but also shows you what the maze looks like without the arrowheads. Notice that the correct path has you fighting the arrowheads at most of the decision points. This brings us to our first maze-solving tip.

> **Maze Solving Tip #1** – Try to **ignore unnecessary distractions** that can nudge you off course. A drawing that leads your eye in a certain direction is usually a trap.

3. Olympic Targets
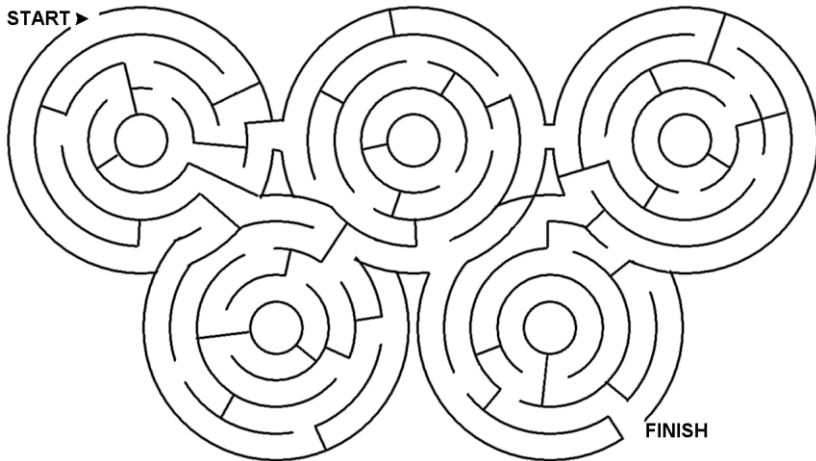
One technique that most successful maze solvers use is ***blocking***. With a bird's-eye view of the maze, the solver looks for major boundary lines within the overall borders.

> **Maze Solving Tip #2** – Try to break a maze into **blocks** that must be crossed or that may be quickly eliminated. Use your right-brain skills to look at the maze as a whole and identify unbroken lines that are boundaries of blocks.
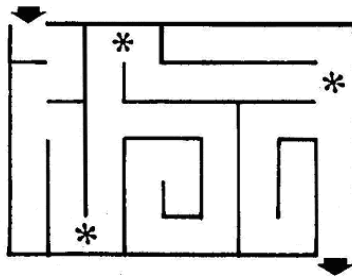
> **BLOCKING** – The solver looks for key points (marked with ∗ on the illustration) that are gaps between obvious visual blocks.

For example, consider the block-shaped puzzle on the next page; the goal is to enter the diagram at the left arrow and exit at the right. The numbers and heavy lines are only included to make the following description easier.
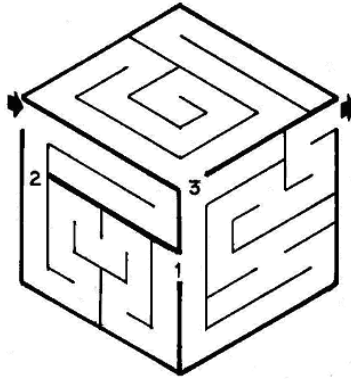
A MENTAL BLOCK

<u>Observation 1</u>: The opening at position 1 is the only exit from the block's left face. Noting this fact, we can use analysis to break the problem into two simpler mazes. First we go from the entrance to position 1 and then from position 1 to the exit.

<u>Observation 2</u>: To reach position 1 from the entrance we must pass position 2. You can see this at a glance because the straight line between these two points (drawn more heavily for illustration purposes) prevents any other path. The line essentially separates the "face" into two sections, connected by a single bridge at position 2. Even if you do not notice this kind of blocking immediately, by the time you reach a dead end the condition should become obvious.

<u>Observation 3</u>: Because the opening at position 3 is the only connection between the puzzle's upper face and the rest of the maze, we can conclude that the entire upper face must be a dead end. We may ignore the upper face without examining *any* of its detail. You can save time and effort when large areas of the puzzle can be eliminated in this manner.

This "blocking" technique encourages you to:

1. Look for areas with only one entry point. These are **blinds**, or dead ends.

2. Look for areas with only one exit point (other than the entrance). These sections of the maze must be crossed because you must reach the exit point.

3. Analyze (or break down) the puzzle into smaller, more workable mazes.

How do maze designers try to prevent you from seeing blocks? One way is by avoiding straight lines as we saw in the Olympic Targets puzzle. Another technique is to create "weave" mazes where the paths cross over each other like freeway overpasses.

4. Watership Down and Back

Hare-iette, a Welsh rabbit, is leaving Warren, her husband. She has two more of her little babies to escort out through the underground tunnels. Help her travel to the babies through this "weave" (three-dimensional) maze. Paths that appear to pass under each other can be used to cross, but not turn at other paths.
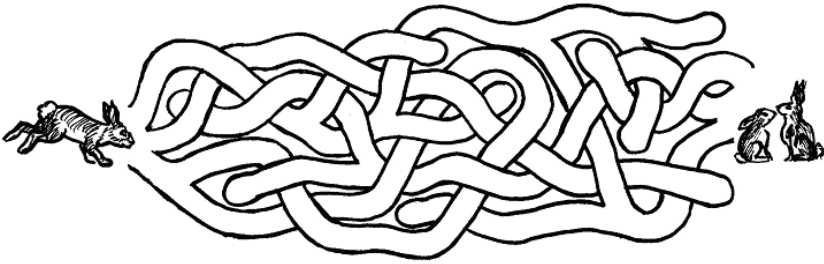
Weave mazes discourage blocking by crossing over their own paths. They force you to think in three dimensions and to look for other approaches to solving them.

> **Maze Solving Tip #3** – **Work backward** from the goal as well as forward from the start. This divides the puzzle into two smaller problems. Working back from the goal usually has fewer traps and dead ends, as well.

How does a maze designer discourage us from solving in the reverse direction? One way is by making it hard to know where the goal lies. A common puzzle for children might ask, "Which kite is attached to which string?"

By offering three possible ending locations, the designer eliminates any advantage to working backwards.

5. Strings Attached

Which kite is attached to the ball of string?
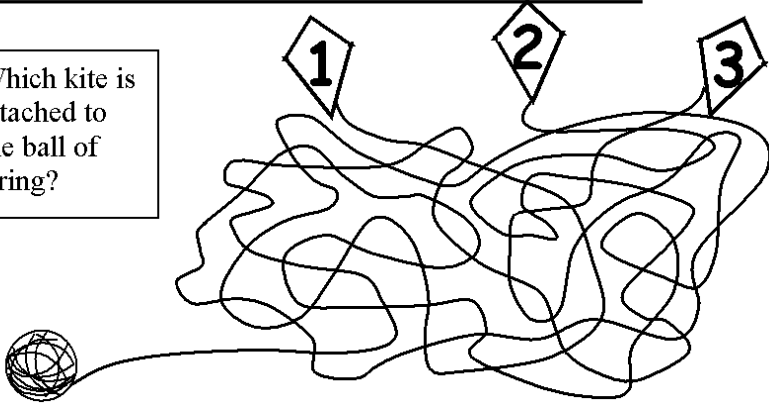
The Best Maze Tip

So far, all of the puzzles have been very simple for three reasons:

1. Easy puzzles build confidence. I don't want anyone getting discouraged.

2. Simple mazes help to illustrate the basic solving tips.

3. Most adults these days don't get much right-brain exercise; I wanted to ease into it.

By the time children reach the first grade, we direct most of their formal education toward left-brain activities: verbal skills, math, logic, etc. Mazes provide right-brain exercise, particularly when we allow our visual thinking to solve the maze as a whole. Before you get involved in the details, always look at the entire maze and let your intuition suggest the proper path. You can actually improve your right-brain thinking with practice.

For folks like me who spend most days in their left brain, I now offer a general rule that can help you find your way through almost any maze.

> **Maze Solving Tip #4** – Imagine that your **left hand** can never leave the wall to your left. Always traveling with your hand against the wall will get you to an exit of the maze.
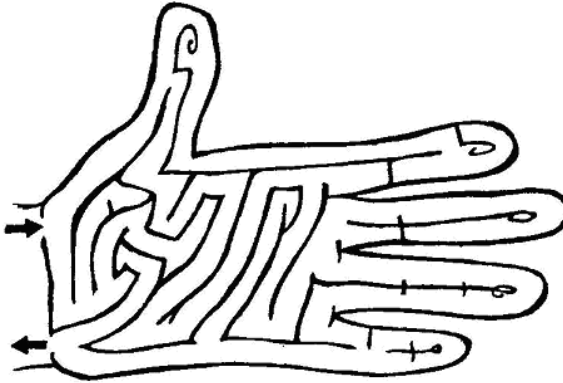
THE LEFT HAND RULE.

Consider the hand-shaped puzzle above as an example. Its entrance is at the upper wrist, and its exit is at the lower wrist. The Left Hand Rule sends you into the thumb, to the index finger, back to the thumb, into the palm, and finally through each of the remaining fingers to the exit. Notice that although the rule diligently directs us from entrance to exit, the path that it traces is not the shortest possible route. At the second decision point (the knuckle of the thumb) we are sent to the left on a needless side trip into the index finger. When we return from the dead end, the rule directs us left along the proper path into the palm.

Hand and Eye-land Coordination

Now that we have a simple, foolproof method for attacking mazes, let's see what's wrong with it. The Left Hand Rule will almost never give us the shortest path. Dead ends and double-backs mar almost any attempt to apply the rule. Another disadvantage is that the rule must be applied continuously from the entrance to the exit; you cannot deviate from the indicated path and later resume the rule expecting it to bring you back to an outside door. This means that shortcuts cannot be safely taken.

The biggest disadvantage of the Left Hand Rule is the problem of *islands*. If the object of a maze is to get to the center rather than to the "other side," then the rule may not work. For example, the goal of the eye-shaped puzzle on the next page is to travel from the arrow to the star at the center.

But applying the Left Hand Rule is fruitless. It takes the solver on a circular trip around the perimeter of the eye's iris but does not begin to probe the center. The rule has failed us.

>   **NOTICE** that applying the Left Hand Rule proves
>   fruitless in this case.

Even if we begin applying the rule on the first circle in from the outermost edge, we wind up on a hopeless loop that reaches neither the center nor the outside. The walls that surround the central star form an island within the maze that is not connected in any way to the outer walls. With no walls connecting the outside to the center, a maze with islands thwarts our Left Hand Rule.

>   **Maze Solving Tip #5** – Be prepared to abandon the
>   'hand' rule when the goal lies within an **island**. Use
>   your blocking skills to recognize where you need to
>   cross over to an island.

One of the five solving tips we've seen can be applied to almost any kind of puzzle, so here it is as a general puzzle principle.

General
Puzzle
Principle **B** **Ignore distractions.** Puzzle designers will try to mislead you and direct your attention away from the primary goal. Fight to stay focused on the main puzzle. Try to recognize the red herrings (irrelevant details) and look elsewhere for the answer.

With these tips understood, we should be ready to begin a more vigorous workout.

Moderate Workout

We can make our mazes harder by forcing the solver to create the maze in his mind. Conceptual mazes exercise your left-brain functions and prevent you from seeing blocks. Try this one:

6. Symbolism

☆ ☆ ○ □ ☆ ○ ☆ ☆
○ ☆ ○ □ □ □ ○ ○
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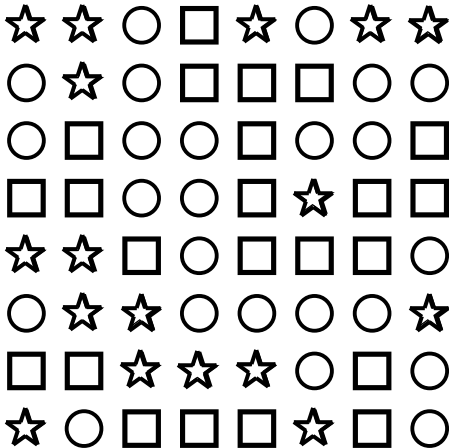
Here is a small, simple maze that packs a punch. The object is to travel between the symbols from one edge of the diagram to another. It is up to you to decide which edge (top, right, bottom, or left) to enter and which edge to exit. There are two rules.

1. You must move up-and-down or right-and-left, never diagonally.
2. You must always move in the spaces between two identical symbols (two squares, two stars, or two circles).

For example, you can enter the bottom edge between the two squares at the center of the bottom row. You can't go right or left from there; both directions have a star and a square lining the path. But you can continue up between the two stars.

Maze Solving Tip #6 – Draw a **diagram** to simplify a complex puzzle and help you use your visual skills to solve it. If you can "see" the diagram in your mind without actually drawing it, you will have an even more powerful tool.

7. Functions of Three
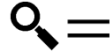
The object of this maze is to go from the "1" in the upper left hand corner of the grid to the "42" at the bottom right. You are allowed to move from a cell to any adjacent cell (horizontally, vertically, or diagonally) as long as the number in the second cell equals one of the following:

- The number in the first cell plus 3. ($+$ 3)
- The number in the first cell minus 3. ($-$ 3)
- The number in the first cell times 3. ($\times$ 3)
- The number in the first cell divided by 3. ($\div$ 3)

For example, you can move from the starting cell to the "3" or to the "4". "3" equals 1×3. "4" equals $1 + 3$.

START

1	4	7	21	6	9	10	12
3	15	5	18	10	30	24	15
6	18	12	8	7	39	27	42
2	36	11	21	13	24	21	39
5	33	18	10	24	7	13	8
8	15	30	12	8	16	10	5
24	12	9	3	13	36	15	48
21	7	7	10	12	24	33	45
10	13	11	4	8	11	14	42

FINISH

Other Tools and Tricks

A clever person who creates a maze sets a few psychological traps for the unwary solver. One of the best traps plays on the solver's tendency to take the most direct route to the goal. An obvious path is laid more-or-less directly from the entrance toward the goal.

Somewhere just short of the goal, this path becomes hard to follow and then comes to an abrupt dead end! The correct path unobtrusively splits off from the long blind some distance back, well before it reaches the dead end. Once the designer has lured you into an "easy answer" that proves to be false, he can spring a more subtle trap.

He runs the correct path parallel to the long, obvious dead end. Subconsciously the solver rejects this parallel route as another trick. He says, "You caught me once, but I won't fall for that one again." The result is a maze-roamer who tries every blind alley until he grudgingly attempts the correct path.

Designers also delight in running blinds together after long, winding side trips. These loops that circle back on themselves are especially difficult to detect in "walk-in" mazes where it is hard to keep overall perspective. In aerial-view mazes these loops can sometimes allow the solver to spot blocks of impenetrable passageways unless the artist has taken special care to prevent the blocking phenomenon described earlier.

> **Maze Solving Tip #7** – Maze designers put obvious blinds (dead ends) parallel to the correct path. When you discover that you have taken a blind alley, don't assume that parallel paths are also dead ends. **Parallel blinds** subtly trap solvers.

Most of the mazes you'll encounter (all of the ones in this book) are viewed as a whole from overhead. Someone who wanders in a courtyard maze with no visible paths beyond the next turn has quite a different problem from the armchair puzzlist. Fun house mazes built with glass and mirrors present a further dilemma to the would-be solver.

Here is a solving tip for folks who find themselves in a physical, 3D maze.

> **Maze Solving Tip #8** – A physical maze in a garden, funhouse, or cornfield doesn't offer you a bird's eye view. In this type of maze look at the ground to find the heaviest traffic areas. The most **heavily worn path** is likely to take you to the goal.

Raising the Stakes

Mazes can have goals other than just getting to a specific location. The next few puzzles have starting and ending locations, but each one also has a secondary challenge as well. The additional rules and restrictions in these puzzles call for both right-brain and left-brain activity. Good luck as the mazes start getting harder.

8. Surreal Estate

A certain real estate developer (with an amazing knack for complicating communities) designed the three-home estate pictured here. A wall with three openings surrounds the square plot of land on which the three houses are built. Each of the gates bears the name of the mansion for which it provides access. Your job, as a quick-witted real estate agent, is to determine the paths that each of the three homeowners could take to travel from his gate to his mansion (marked with the same two-letter code) without crossing or joining the paths of the others.

Roman Palace (RP)
Charles Mansion (CM)
Sharon Estate (SE)
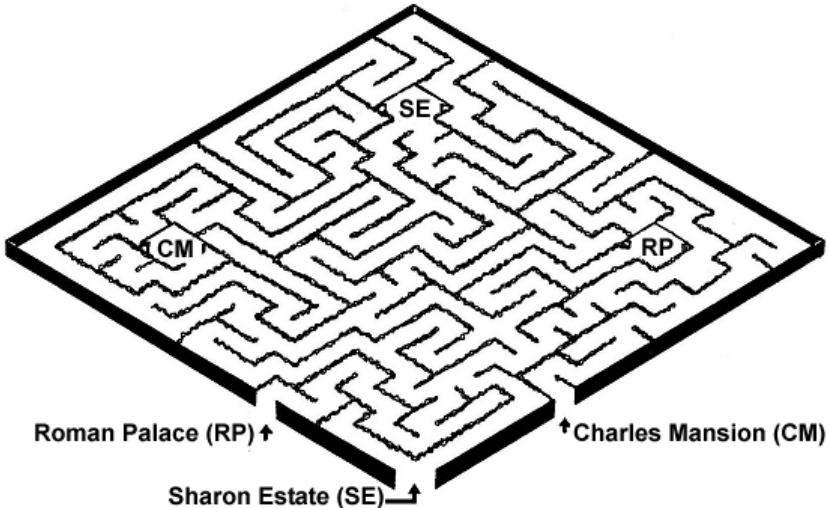
9. St. Valentine's Day Massacre

The object of this maze is to spell out the word "Valentine" by visiting each of the word's letters in its proper sequence. Begin and end at Cupid's arrow. Although you may visit the same letter twice (and count it both times), you are not allowed to cross your own path nor pass through the same section of corridor twice. It is not exactly heart-pounding entertainment, but it will put you in a puzzling vein.
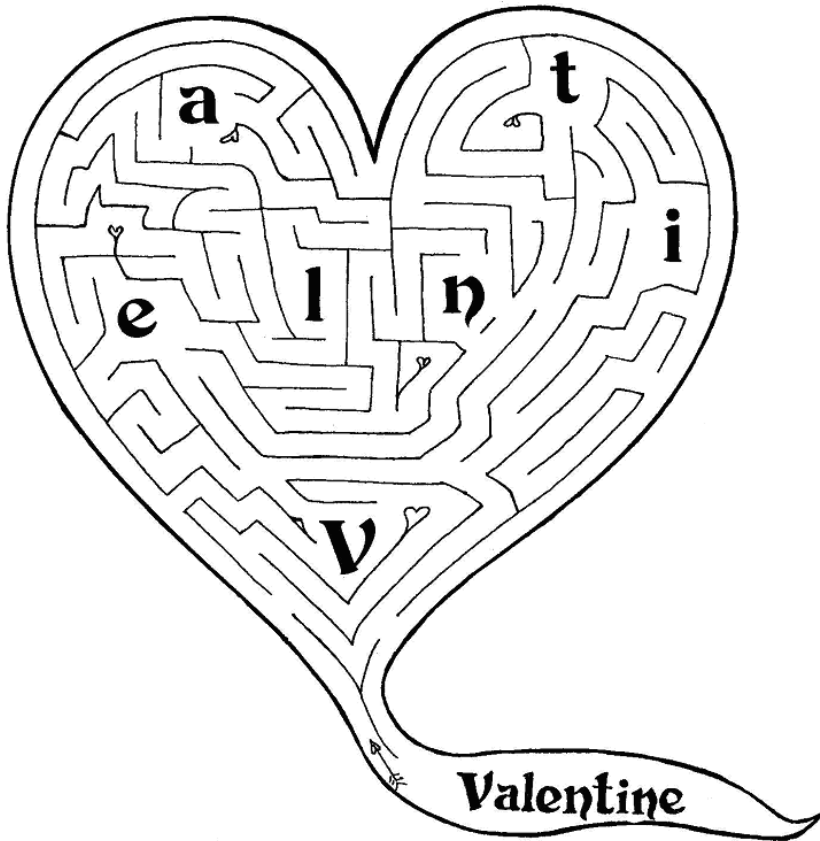
Strenuous Training

One more method a maze creator can use to confound the solver's attempts at blocking is to have moving walls or doors that open as you move through the maze. In a fun house or garden maze these doors may take the form of shifting walls like the one in the 1972 film version of ***Sleuth***. The rest of the mazes in this book change in some way as you solve them.

> **Maze Solving Tip #9 – Moving walls** usually require you to switch your thinking, at least partially, into your left brain. Because the maze changes, you'll need to consider the impact of the changes on the overall puzzle.
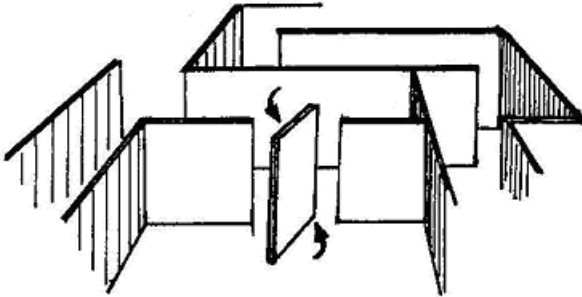
SHIFTING WALLS OR DOORS make it difficult to see blocking.

The remaining mazes in this chapter all employ some technique for changing the maze as you solve it. Each puzzle challenges you to use different techniques to overcome the obstacles. Apply creativity and resourcefulness as needed.

10. Roundhouses

This maze comes with a twist to make it a little more difficult. The black circles represent roundhouses. Like old-fashioned railroad roundhouses, each circle can rotate to change the orientation of the path it contains. Every time you enter a path through one of the roundhouses, the roundhouse (circle) will immediately rotate 90°. So, if you enter from the east or west, you must exit to the north or south. If you enter from the north or south, you must exit to the east or west. You can never go straight through a roundhouse. You may want to use a paper clip or matchstick to help you remember which direction each roundhouse is facing as you leave it. With that complication in mind, find your way from the start to the finish.

11. One Black Knight

BLACK

WHITE
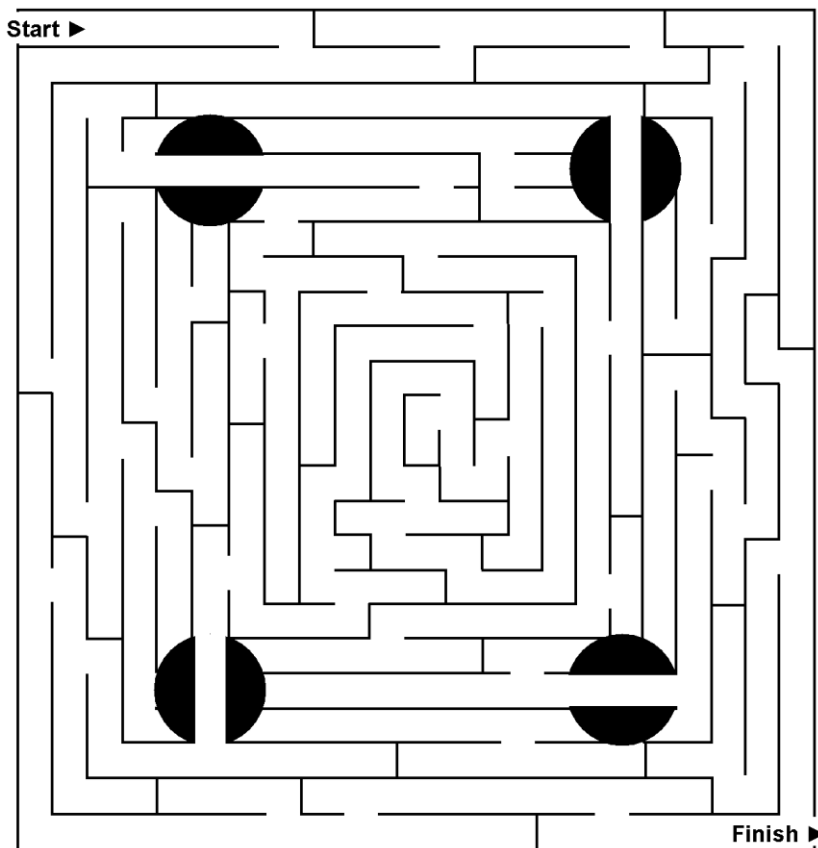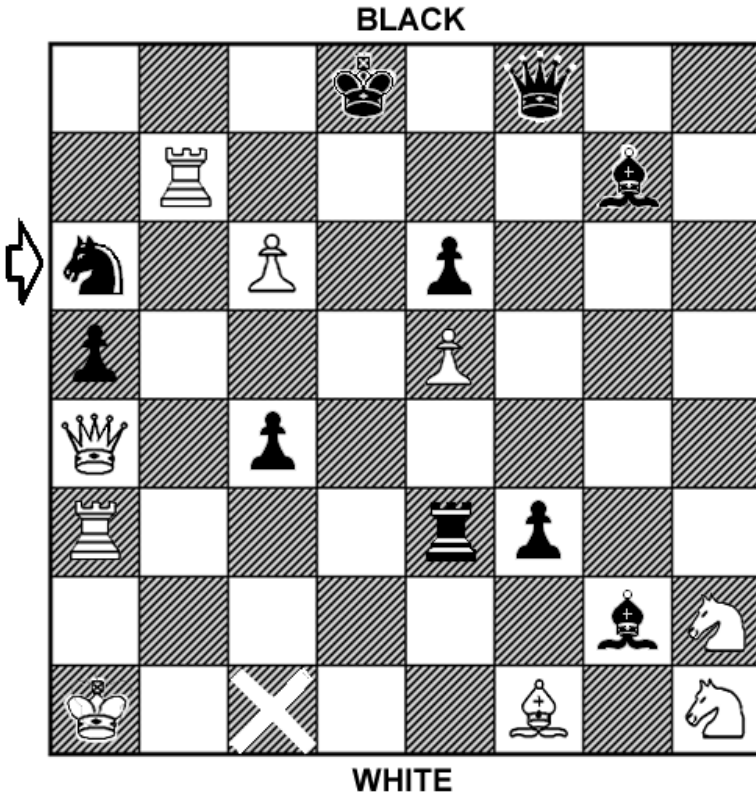
This puzzle is worked on a chessboard. If you don't know how to play chess, you'll have to skip it. Begin with the board arranged as shown and move the black knight, according to normal knight movement, from its starting point at QR3 to the square marked by an "X" (QB8). Only the black knight can be moved; all other black and white pieces remain as shown unless captured and removed from the board by the knight. Follow the normal rules of chess with one added stipulation: the black knight must never put itself in a position such that White could legally capture it if White were allowed to make its next move as usual. For example, the knight cannot make its first move to QB2 (to the right of the rook) because the rook could attack that square if the rules of this puzzle did not prevent White's movement.

12. Block Party
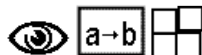
Enter this maze at the "START" and exit at the "GOAL." You may move from one empty square to another: north, south, east, or west, but not diagonally. The heavy lines represent walls. The shaded, lettered squares represent huge blocks. The wavy band running across the center is a moat.

You may not go through the walls or blocks. However, you can push blocks as long as there is no wall and no block on the opposite side of the block. For example, in this starting position you could push block C north or south but not east or west. The wall to the east of the block prevents you from pushing it east or west. Likewise, you could push block D east or west but not north or south. When you push a block, you must push it the full length of a square.
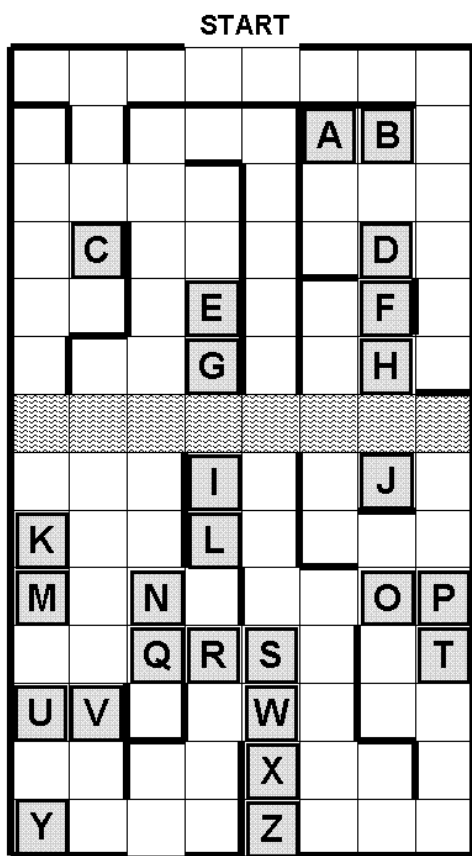
You can't cross the moat unless you first push a block into the moat to use as a stepping stone. A block in the moat allows you to step directly across the moat, not sideways. Once a block is pushed into the moat, it can never be moved again. Be sure to remember where you've moved each block. Now, push on to victory!

The last two puzzles in this chapter are ***challengers***. The casual solver may be frustrated and should not attempt them. The answers (at the back of the book) will act as your "spotters" to avoid any injuries.

Challenger Puzzles

WARNING: Very Tough!	Believed to cause cancer in laboratory rats

13. Two Door Hard Top

See the next page for instructions.

ENTRANCE
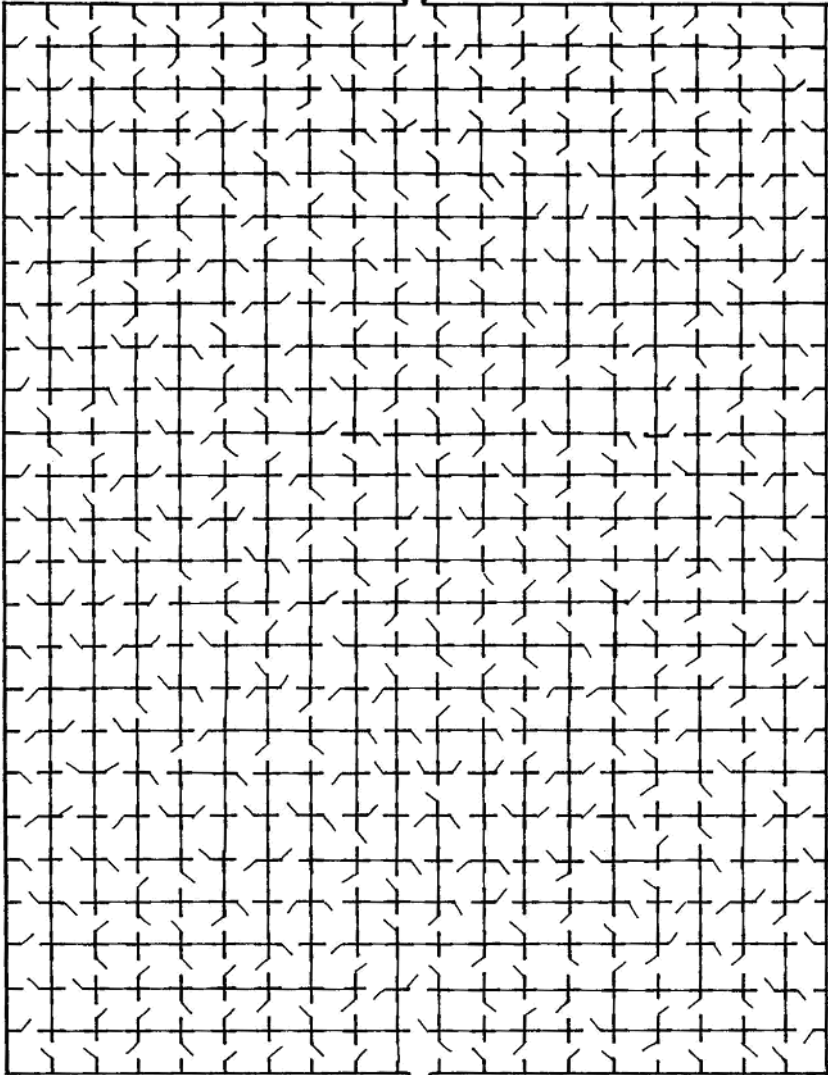
EXIT

To thread your way from the entrance at the top of the maze to the exit at the bottom, you will have to open two doors. Each of the 475 rooms in the diagram has doors that are shown as either opened or closed. You may not go through walls or closed doors. But you can solve the puzzle by opening only two doors. Which two doors should you open?

---

14. Stop Watch
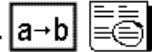
The maze on the following page consists of a series of concentric, circular passageways shaped into the face of a clock. To work the puzzle, you will need to make a pair of moveable hands for the clock. I suggest using stiff wire, straightened paper clips, or narrow twist-ties. Whatever you use should be cut to the lengths of the hour hand and minute hand shown as lines above the clock face. Neither hand should be wider than 1/8 inch. When properly made, the minute hand should reach from the center of the clock to the outermost circle, and the hour hand should reach the second circle in from the outside (i.e., it will block the corridor containing 9:00 but not 12:35).

Begin with the watch hands set at 12:00 and a pointer on the large "12" at the top of the clock. Enter the clock face by moving down and then around the outermost corridor. Be careful to avoid crossing both the hands and the circular black lines drawn on the face. Whenever you come to a time notation (such as 9:30), stop and change the clock hands to represent the indicated time. Then continue in either direction from there until you can escape from the clock face at the "6" (bottom of the watch).

Example: If you go clockwise around the outer circle from the top, you come to "10:15." You stop here and reset the watch's hands. Now the minute hand keeps you from going straight out the bottom. However, you can still reach "12:10", "3:40", "11:35", or "12:35" before you have to change the hands again.

Keep track of each time notation you encounter so you can compare your answer to the book's solution. In keeping with the timepiece theme of this maze, you may want to measure how long it takes you to solve this difficult problem.

Hour Hand   **Minute Hand**

12
11 1
10 2
9 3
8 4
7 5
6

12:10
12:35 11:15 10:15
4:00
9:00 6:00 1:20
10:00 2:00
12:45
12:00 8:45
8:15 11:45
12:25
9:15
3:40 3:00 6:15 5:00 2:20
5:45 7:00
11:35 6:20 7:15
8:30
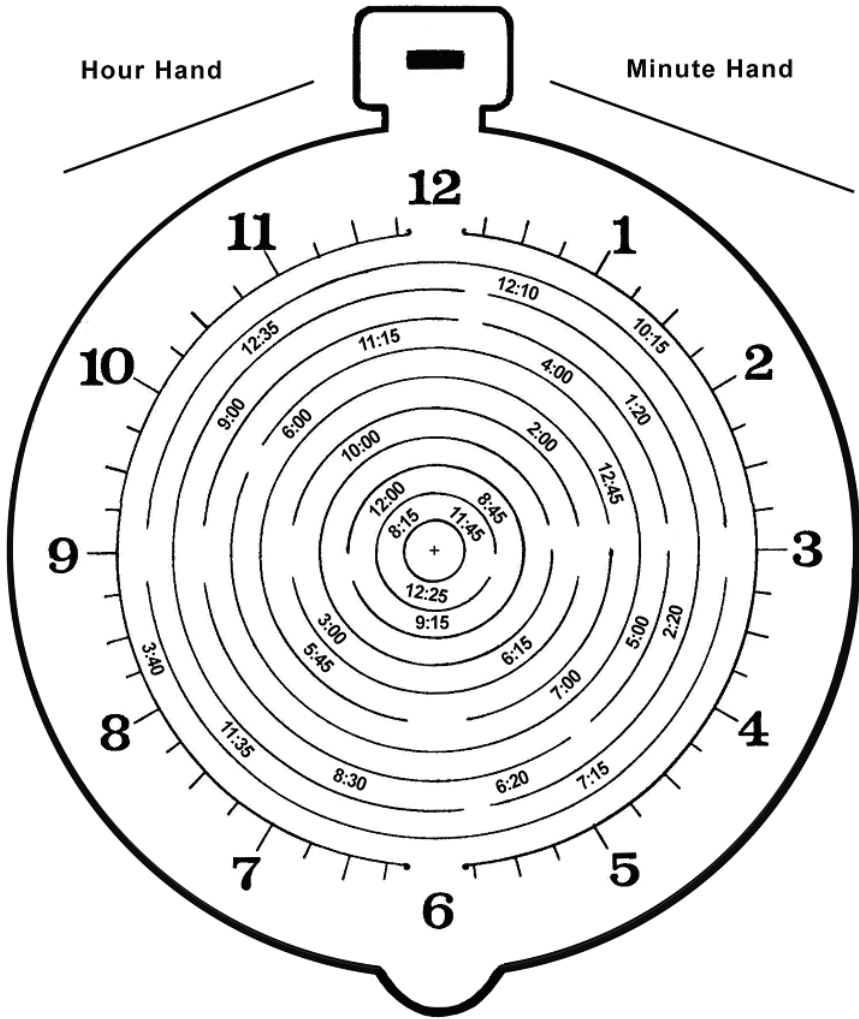
Ratings: 30 minutes Compete for the world's record!
45 minutes Consider yourself a genius!
60 minutes Deserve a 'big hand.'
90 minutes Win the Perseverance award.
?? Longer? Stop & Watch someone else go crazy.

Mazes Bibliography

There are many maze books (particularly children's books) to be found. Here are a few that I think are a cut above the others I've seen.

Shepherd, Walter. <u>Mazes and Labyrinths: a book of puzzles</u>. New York, Dover Publications, Inc., 1961.

Myers, Bernard. <u>Supermazes No. 1</u>. Garden City, NY, Doubleday & Company, Inc., 1977.

Locke, Nathan and Matthew Locke. <u>The Big, Big Book of Mazes</u>. New York, Mud Puddle, Inc., 2003.

Some Noteworthy Web Sites

logicmazes.com – Robert Abbott's terrific interactive mazes and puzzles to solve!

www.clickmazes.com – Andrea Gilbert's mazes and interactive puzzles - lots of fun

www2.stetson.edu/~efriedma/puzzle.html – Erich Friedman's puzzle palace has a huge variety of clever mazes and other puzzles

www.krazydad.com/mazes – Jim Bumgardner's huge collection of attractive, printable mazes

www.amazeingart.com – Christopher Berg's visually stunning maze art and commentary

www.astrolog.org/labyrnth.htm – An eclectic collection of computer and hand-drawn mazes

www.falstad.com/maze – Interactive "walk-through" mazes from a ground-level perspective

www.mazoons.com – Jody Hall's whimsical cartoon mazes to print and solve

www.bluebonkers.com – Printable mazes and other activities for children
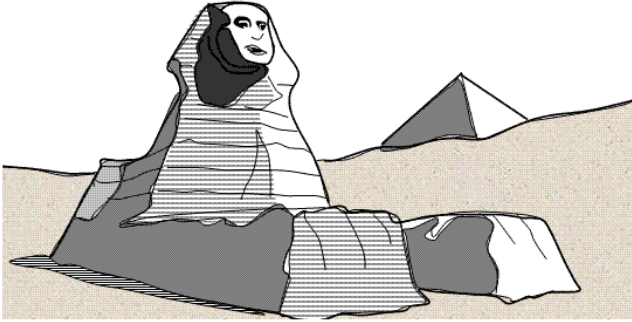
Chapter 2 – Riddles

As I said in the Orientation, you can skip the following story if you want to go straight to the puzzles. The story is presented as a humorous introduction to riddles. It is intended to show that riddles have fascinated mankind for millennia.

Story

uman history is riddled with enigma. Greek mythology holds one of the oldest and best-known stories about a riddle. The city of Thebes was in mourning (even in the afternoon) since their king's sudden death in a highway traffic accident. To make matters worse, the Sphinx (a giant, winged lion with a woman's head) had perched herself on a cliff at the outskirts of town and was really becoming quite a nuisance to all passersby. In fact, she filled her otherwise humdrum days by posing a very difficult riddle to each passing traveler. The gloating Sphinx promptly devoured anyone who failed to come up with the correct answer (an occurrence often repeated in a figurative sense by modern riddlers).

After several square meals, the Sphinx finally met her match in a man named Oedipus (known as Rex, for short). Oedipus, complex and dauntless, confronted the stonehearted beastie that pyramided evil powers on evil intentions. The confident Sphinx presented the riddle: "What animal is it that goes in the morning on four feet, at noon on two, and in the evening on three?" The Sphinx was so outraged when Oedipus delivered the correct answer that she jumped to her doom on the rocks below her cliff perch.

Meanwhile, back in Thebes, Creon (pronounced "crayon") was acting ruler of the kingdom, and he pronounced Oedipus (pronounced "eddy puss") the new king. The rest of the story ignores riddles altogether, but – in short – the new monarch moved in with his widowed mother and lost sight of the public good.

Warm-Up Exercises

Joke Riddles

A riddle attempts to define a familiar object in a puzzling way, in terms that disguise it. Most people think of a riddle as a one-line question-and-answer joke. Here's a riddle that was popular in the 1960's:

What's purple and conquered the world?

The answer was a play on words tying together the color reference and a world conqueror in a totally nonsensical way. The answer was Alexander the Grape. This type of riddle doesn't exactly qualify as a puzzle. It doesn't provide enough information, and the answer is too silly. Here is my corollary to that riddle, which you might have a better chance of solving:

---

15. Alexander

What did Alexander the Grape do to the world?

Because you know the first joke, you can guess that Alexander conquered the world, but where's the joke in that? Can you make it into a pun? My response is: He concord the world.

No one really expects people to figure out the intended answer to this type of riddle. In fact, most people are crestfallen when you've heard the joke before or happen to guess the answer. Here's another silly Q&A riddle that you might have a fighting chance at solving. Hint: Do the addition and say your answer out loud, looking for the pun.

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16. 50 / 50

What do you get if you cross 50 female pigs with 50 male deer?

Okay, these joke riddles really aren't fair puzzles. Let's look at some riddles in the classic style.

17. I'm Lost

I'm lost in the deepest canyons but surround you on the sea.
Each day at dawn I show myself, but no one touches me.
The birthplace of the sun - a tomb for moon and stars,
A limit line that runs around this great big world of ours.
Perhaps you'll want to broaden yours to answer this exam.
A level-headed view will help determine who I am.

Hopefully, you solved this riddle without much trouble, but you might have changed your mind a few times as you got farther into it. In fact, I'd recommend that you guess the answer to each riddle after you read each line of the poem. Your answer will often change as you discover more information, but you can watch your thought process and get some insight into how your mind is working.

Analysis of *I'm Lost*: Water gets lost in the deepest canyons and surrounds you at sea, but later lines eliminate "water" as an answer. If we look at the first two lines only, "the sun" is a good answer. But line three tells us it isn't the sun. The sun is "born" in the east, but the moon "dies" in the west. The fourth line defines the answer as a line running around the world. East and west are both parts of a line we call the horizon. Keeping our heads level (line six) prevents us from looking up at the sky; that eliminates a line like the ecliptic. The fifth line refers to the cliché: "broaden your horizons." Horizon is the answer.

This analysis provides some examples of the following riddle solving tips:

> **Riddle Solving Tip #1 – Consider every hint** provided to you. The wording, the title, the rhyming, and even the shape of the riddle can be clues.

> **Riddle Solving Tip #2 – Identify the key words** that you think are significant in the riddle, and put most of your work into understanding and playing with those words and their definitions.

Riddle Solving Tip #3 – Think of different (non-obvious) definitions for the key words in the riddle. Words are often chosen to get you thinking of one definition when another definition is really being used.

Riddle Solving Tip #4 – Try to relate several key words to a common subject. Then try to relate the other clues to that same subject.

Riddle Solving Tip #5 – Be flexible. If one answer fails in some significant aspect, write down your failed guess and then forget it. Riddles almost always contain a "sucker trick" where most of the clues lead to an obvious answer – an answer that is later disproved.

Riddle Solving Tip #6 – Consider idioms that use words in a nonstandard way (for example, a frog in your throat).

Even with a simple riddle like *I'm Lost*, you can apply each of these tips. Consider another easy riddle that brings its own unusual twist:

---

18. Out for a Spin

A planet spins, and so do I —
In seas wherein I'm never dry.
I am a cornucopia, an empty horn,
Whose soapy appearance springs
From fluids moving down —
So handsomely improving
Speed as they drop
Through tighter
Orbits from
The top
around
the
core.

Maybe you solved this one without even reading it. The shape of the poem suggests the answer. A waterspout spins above the water, but this is something that spins downward into the water. Whirlpool is the answer. Try this one:

19. Clearly

Clearly,
Help is needed,
And we
Really pleaded.
I live
Through assistance
You give.

Riddle writers can make a puzzle tougher by giving us less information. A short riddle gives us fewer hints. How can we be sure we have the intended answer? This puzzle lets you apply Tip #1 in a special way. Read the upper case letters at the beginning of each line, and you'll see the answer. This is called an acrostic. You won't see them very often, but it doesn't hurt to check.

Most riddles are more mysterious and obscure than the ones we've seen so far. The next one is a classic enigma from the nineteenth century. It gives us very few clues and is wonderfully confusing, but the answer makes everything clear. Try to make sense of it before you skip to the answers. The thrill of victory is worth it.

20. To the Wood

I went to the wood and got it. And when I got it, I looked for it. And because I couldn't find it, I brought it home in my hand.

I think we're ready for another general puzzle principle:

Change your approach. Most puzzles try to entice you into the wrong plan of attack. If one approach doesn't work, try another. Try turning the puzzle upside down or pretending you are a five-year-old seeing this sort of thing for the first time.

Now you'll have a chance to exercise all of those riddle-solving tips. As you work the next puzzle, what words help you narrow in on the answer? What different meanings can they have?

21. So Hard

If you want me to be useful,
　　　Here is something you should try:
Find me sitting on a cushion
　　　And just poke me in the eye.
Don't expect it to be easy.
　　　First, I'm awfully hard to find,
For my hiding's legendary
　　　Like that phrase that comes to mind.
And besides, I will resist you,
　　　And I'm known for punching hands.
Then I'll slip into your clothing
　　　Taking with me all the strands.

22. Can't Burn

A fire can destroy me,
Although I can't burn.
And fire can create me
As you will soon learn.

I'm big as an ocean
Or small as a pin,
And no one can count all
The shapes I am in.

I can stand still or dance
Or go for a walk.
I've even been seen as
The hand of a clock.

Suddenly, the last line of the poem gives us something to work with. Until the final line, the clues are nebulous and lacking in focus. What is sometimes seen as the hand of a clock?

Next, we'll take the riddle in a different direction. Here is a classic poem by Lord Byron. It is one of my all-time favorite puzzles.

23. Lord Byron's Riddle

I am not in youth, nor in manhood, nor age
But in infancy ever am known.
I am a stranger alike to the fool and the sage,
And though I'm distinguished in history's page,
I always am greatest alone.
I am not in earth, nor the sun, nor the moon;
You may search all the sky--I am not there;
In the morning and evening--though not in the noon--
You may plainly perceive me--for like a balloon,
I'm midway suspended in air.
Though disease may possess me, and sickness and pain,
I am never in sorrow nor gloom;
Though in wit and wisdom I equally reign,
I'm the heart of all sin, and have lived in vain,
Yet I ne'er shall be found in the tomb.

This poem hides its answer behind the meaning of the words, when the answer really deals with the spelling of the words. The answer is the letter "I." This is made even more cunning by the use of "I" as a personal pronoun in the poem. This "who am I?" approach was, and continues to be, a common practice in riddles.

Another poetic riddle about the letter H, which is longer and even more clever, was written by Miss Catherine Fanshawe. *Bartlett's Quotations* has a part of it, but riddle lovers will find it worth digging through the Internet to unearth the entire poem.

Letter By Letter

Now that the famous Lord Byron has broached the subject of using spelling in riddles, let's look at letter-level riddles. Consider the following example:

24. Letter-by-Letter Tool

My first is in full note but never in tune.
My next is in meteor but not in moon.
My third is in love – except not in time.
My fourth is in tree limbs though never in climb.
My last is in mindful although not in mind.
My whole is in tool kits and never inclined.

This type of riddle is a letter-level charade. It gives clues to the spelling of the answer word by narrowing down the possible choices for each letter in the word. The answer to this puzzle is a five-letter word. We can see this because the poem has five components and a sixth line describing the entire answer. Let's break down each line.

Letter	Found in	Not Found in	Possibilities
1	full note	tune	F, L, O
2	meteor	moon	E, T, R
3	love	time	L, O, V
4	tree limbs	climb	T, R, E, S
5	mindful	mind	F, U, L

The answer is something found in tool kits. An additional clue is that it is not inclined.

There are two ways to begin solving this type of riddle: you can work with the letters, or you can try to get the whole answer. Usually you can limit your possible answers quickly by starting with the "whole." What are some five-letter words for things found in tool kits? Some possibilities that come to mind might be drill, plane, ruler, level, gauge, knife, snips, miter, meter, and punch. Only plane and level might not be inclined, and only "level" matches all of the letter choices in our table.

Suppose we had started by working with the letters. The first and the last letters are usually the most helpful. In this case let's look at the last letter. Of the three possibilities, "L" is the most likely to end a word. Almost no words end in "U," and "F" isn't very common, especially considering the choices we have for the fourth letter. If L is

the final letter, what could the fourth letter be? Only E makes any sense just before the letter L.

We can't eliminate any of the first letter choices, but we can ask what tool kit items start with one of those letters and end in "EL." Trying various possibilities leads us to "level."

This is an example of a letter-level charade, but perhaps going letter by letter is too tedious for you. Let's look at some other charades that you'll find as riddles.

A ***charade*** is a form of wordplay where you break a word into pieces and then provide clues for each of the pieces and for the whole word. Maybe you've heard of a pantomime game called charades, where players act out movie or book titles. Players of this game often break the words down into syllables to get their point across. But charades can take several forms.
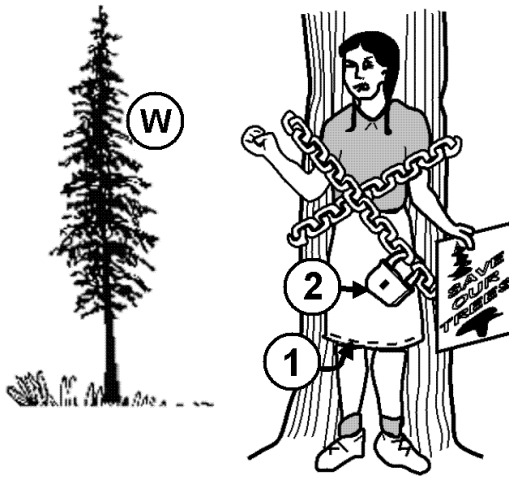
Here is a pictorial charade in which the whole word (marked "W") is illustrated by a drawing of a tree. The two pieces (marked "1" and "2") are pictured as a skirt's hem and a lock. Put the two pieces together and get hemlock, which is the tree pictured. Try a few more of these pictorial charades before we return to the classic riddle format.

25. Pictorial Charades
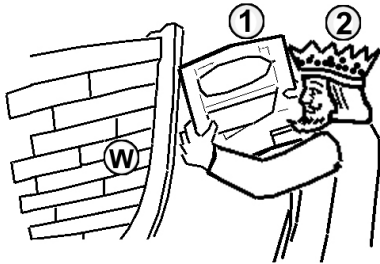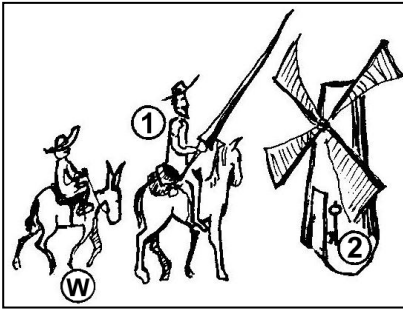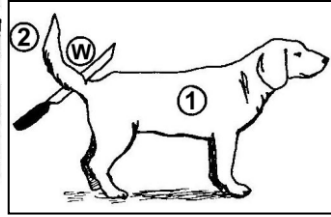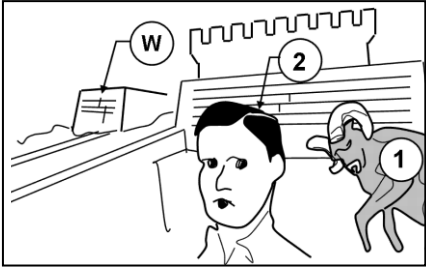
Moderate Workout

The next two picture puzzles rely on spelling, not the pronunciation, of the two component parts. Expect them to be a little bit harder.

26. Spelling Charades
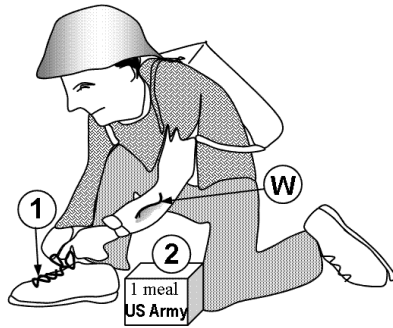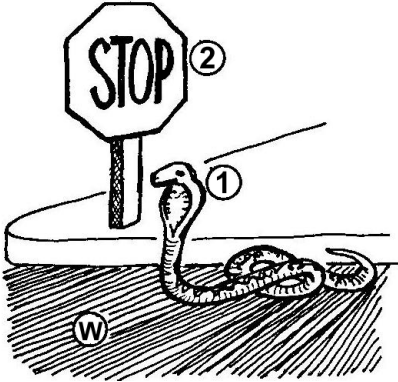
One-Liner Charades

A charade puzzle can be written as a tricky line of text where the parts and the whole are woven together into a phrase or sentence. Let me explain a few examples. The number in parentheses after each phrase indicates the number of letters in the answer.

> Short skirts test the clergy (8)

The first part of the charade is a word meaning "short skirts." The second part is a word meaning "test." The whole is a word meaning "the clergy." If we put MINIS together with TRY, we get MINISTRY.

A charade can have more than two parts.

> Not even yours truly lashes freaks (8)

The first part is a word meaning "not even." The second part is a word meaning "yours truly." The third part is a word meaning "lashes." The whole is a word meaning "freaks." "Not even" is odd; "yours truly" is I; and to lash something is to tie it. "Oddities" is the

answer. In this example, the puzzle has a surface reading that leads you away from the actual answer. "Not even" and "lashes" have other meanings that make the puzzle sound like we're talking about floggings. This is one of the things that make these charades difficult but so satisfying when you solve them.

These examples have shown the component parts before the whole. Sometimes the whole appears before the pieces.

> Argumentative subject promises to pay (11)

"Argumentative" defines the whole. "Subject" defines the first part. The second part is "promises to pay." Combine CONTENT with IOUS to get CONTENTIOUS.

The parts don't have to be presented in order (first, second, third...) as long as the phrase tells you how to sequence them.

> Trump pursues desire for Texas beef cattle (8)

The word for "trump" *pursues* (follows) the word for "desire for" to make a word meaning "Texas beef cattle." Put HORN (trump) after LONG (desire) to get LONGHORN. Notice that the surface reading is very misleading; it sounds like Donald Trump wants to get into the cattle business.

Sometimes the parts of the charade are abbreviations for the words in the puzzle.

> Bleary page editor used a keyboard wrong (8)

"Bleary" means "misty." "Page" gives us the abbreviation "p." "Editor" is abbreviated "ed." The whole is "mistyped" (MISTY+P+ED). I think you get the idea. Now I offer you the opportunity to puzzle over the following charades:

27. One-Line Charades

1. Dads sample pie (6)
2. Guys cuss tuxedos, for example (8)
3. Milk on your lip has got to hurt (8)
4. Ardent request precedes certain delight (8)
5. Stomped on bum calculator display (8)
6. Give prisoner testimonial (10)
7. Wait, that is unmentionable (8)

8. Suspect corrosion after fog (8)
9. Locks 100 Internet addresses (5)
10. Monday before long seasonal rain (7)
11. Allow entry? Yes, with deadly force (8)
12. Table etiquette authority on page 1 (8)
13. Approves rodent if that is satisfactory (8)
14. Former spouse dogs me on trip (9)
15. Staffs incomplete on Southern plantation homes (8)

More Charades

A charade can be made into a riddle by building a word from two or more syllables. Here is an example:

28. Playful Rascal

My first is a rascal, playful and sly.
My next is the falsehoods that rascal will try.
Then both came together and ever since,
My whole suggests a word meaning hints.

The first syllable is a word meaning "mischievous rascal." The second is a word meaning "falsehoods." The whole means "hints." Put IMP with LIES to form IMPLIES. This charade works in spelling and in the sounds of the syllables. Many charades work only in their spelling. Consider these potential charades where the spellings, not the sounds, form a new word: page/ant, off/ice, and wee/knights. Here a few more charade verses to give your brain a workout.

29. Time and Space

My first is present – future's past –
A time in which your lot is cast.

My second is my first of space
Defining people's present place.

My whole describes a lack of site –
A place without length, breadth, or height.

30. Few Can Reveal

My first is in rhyme and very obscure.
Next found throughout time but not to endure.
Third and fourth in decide but not easy choice.
My fifth is in love but never in voice.
My last in concrete but also unreal,
For I'm an enigma few can reveal.

31. Same Time

My first is a swindle; second, a mutt.
My third is a payment, the landowner's cut.
Now put them together. Work out this rhyme.
My whole is a word meaning "at the same time."

By now you've noticed that many of these riddles are written in verse. This serves several purposes. First, it adds a touch of class and literacy to an otherwise simple question. Second, poetry makes the riddle more mysterious. A third reason for poetry is to force the solver into the author's exact language. Many riddles are based on wordplay that can be ruined by the slightest wording change. By putting a riddle into a poem, the author helps ensure that the riddle won't be misquoted, especially by someone who does not yet know the answer.

Word Surgery

Sometimes a riddle can ask what you get if you perform surgery on a word. I'll spare you the poetry in this example.

32. Scalpel, Please

Cutting off a pet's tail causes worries.
Endless worries mean maintenance.
An automobile is endless maintenance.
What is the pet?

These riddles usually "curtail" or "behead" the original word and provide definitions for the resulting words. To *curtail* is to remove the final letter or letters. To *behead* is to lop off the first letter or letters. Here we start with a pet, curtail to a word meaning worries, curtail

again (*endless*) to get maintenance, and curtail again to wind up with an automobile.

Start with the word "caress" (a pet). Curtail it to become cares (worries). Curtail it again to become "care" (maintenance). Curtail it again to become "car" (automobile). Notice that you may find it easier to approach a puzzle like this by identifying the last (shortest) word first. Identifying an automobile as a "car" is probably easier than identifying a pet as a "caress." In fact, riddles like this can also be constructed to add letters a step at a time. Later, you'll see an example of a puzzle that adds and then subtracts letters.

Did You Say Al Gore?

An allegorical riddle tries to represent an object or action with other things that have similar qualities. It is a story in which the elements have another meaning. The riddle of the Sphinx and Samson's riddle from the Bible use allegory to hide the true identity of an object. When J. R. R. Tolkien has Bilbo Baggins and Gollum playing the riddle game, most of their challenges are allegorical riddles.

Consider this riddle poem:

33. Scarlet Plankton
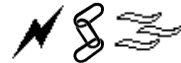
> Scarlet plankton with the tide
> Wash through caves where deep inside
> They feed the fishes living there
> And then, as waste, return for air.

"Scarlet plankton with the tide" evokes images of microorganisms (like algae, only red) ebbing and flowing in a constantly moving liquid medium. "Wash through caves" gives the impression of cleansing and splashing with a current in grottos or tunnels that go deep into their surrounding rock. The next line states that the microorganisms are food for much larger and animated organisms in the caves. Finally, the tide carries waste away to return "for air." Perhaps the last reference means a new breath or spirit, or just an escape from the caves.

Where do all these images lead? What one thing is being depicted by the plankton allegory? It was intended to describe blood. Blood is red and moves with pulses through channels. It carries food to the body's organs and then returns to the lungs for air.

Most of the riddles passed down to us from the ancients are the allegorical type. This should not surprise you because the other types don't translate well from unfamiliar languages and across the centuries. For example, I have a difficult time finding the wit in Latin puns.

34. Gallery

I am a thing great artists draw
        Without a pen or brush.
I am, at times, against the law -
        Created in a rush.

'Though folks compose me, I may give
        Artistic types a hand.
For only short times I can live
        Where people sit or stand.

One person can assemble me
        At parties - host, that is!
In solitude I cannot be
        Created. That's my quiz.
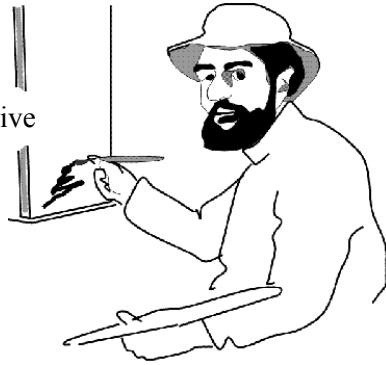
35. How Like a Dove

How like a dove – when I'm complete
I fly above my first who'll eat
A bit of anything it can
To grow and then be fare for Man.
My second ran a length of time,
Far longer than this silly rhyme.
By linking animal and age,
My whole you can release or cage.

36. Low Finance
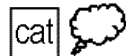
I make my money, a dollar gain.
Take any from me, and naught remain.

37. Rev. Spooner's Conundrums

A spoonerism is a phrase where the initial sounds of two words are switched. Examples include:

> *mad banners* instead of *bad manners*
> *wave the sails* instead of *save the whales*

Here are some Q&A riddles where one answer is a common phase and the "difference" is a spoonerism of that phrase. Hopefully, each question gives you enough information to come up with the answer. Try this sample: What is the difference between a moist burglar and a professional philatelist?

A professional philatelist is someone who buys and sells stamps, a stamp dealer. The moist burglar is a damp stealer. Damp stealer is a spoonerism of stamp dealer. If you can figure out one of the two answers, the other answer is just a spoonerism away.

1. What is the difference between Alpo and a Beau Brummell in the mist?
2. What is the difference between a melancholy story in song and a disgusting lettuce dish?
3. What is the difference between a comprehensive strategy and a guy who coats walls?
4. What is the difference between a red-faced black bird and a coup de grâce?
5. What is difference between a gangster in a shootout and a baker sugar-coating cinnamon rolls?
6. What is the difference between a cloudburst and an ache that makes a lion howl?
7. What is the difference between a completely false story and having no baked pastries?
8. What is the difference between dancing the Limbo and dismounting a chin-up bar?

Strenuous Training

Now you have seen almost every type of riddle that I'm aware of. There is nothing left to do but begin your strenuous workout. The answer section at the back of the book will provide first hints, then full answers if you are having some difficulty.

38. Wax and Wane

Adding a letter to a little article results in an article twice the size.
Add another letter at the start to get light brown.
Laurel grows when another letter is placed at the start.
Then a Roman one squeezes in to create a spot.
Forcing another letter in the middle creates stress.
Then instruct by removing the first letter.
You get cats and dogs when you do it again.
Then I departed, fled.
And removed the end for an ancient god.
Top grade results from a final beheading.

39. Home

This one symbolizes the warm, loving center of a home.
Curtailed, he is still the center of love and emotion.
Curtailed again, he is a way to sense the world.
When this is cut in half, he is all that is left.

40. Beats Me

When you take it, your bravery's growing.
If you break it, it just keeps going.
If you lose it, it sends you reeling.
If I touch it, you feel the feeling.
One can steal it to fan love's ember.
What's known by it you will remember.

41. Play with Me

To most, my left will be their right.
I'm down and up, not front and back.
At times, I'm dark with lots of light.
And on my rails, no train on track.

My legs are never used to walk.
My wings do not allow me flight.
You come to hear, but I don't talk.
I lure but often cause folks fright.

My hands are those you rarely see.
But when my story is unfurled,
You'll gladly pay the entrance fee,
For people say I'm all the world.

42. Sound Reasoning

My usefulness I quickly prove
When someone writes an ode of love.
And lyricists my rules obey
When writing songs in any key.

I'm masculine or feminine,
Affecting almost every line.
And just when things go bad to worse,
At last you find me in this verse.

43. Friend to Friend

First and last, the capital of Sweden --
With a mile stretched from end to end.
Eve and Adam wore these in Eden
And exchanged them as friend to friend.
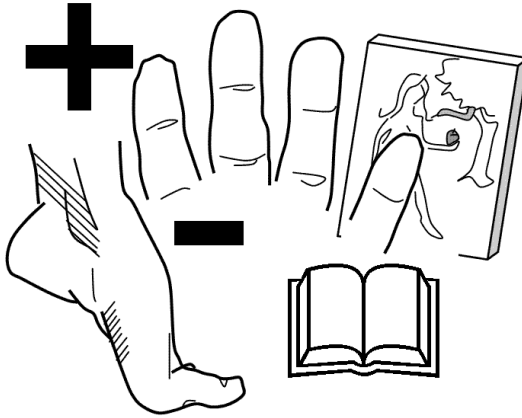
44. Impress Me

My first is in positive; negative source.
My next held by fingers - not nails, of course.
My third used in publishing, not only books.
Fourth put among paintings in salons and nooks.
My fifth comes from feet and in fresh dirt somewhere.
Entire, in plural, I sound like throne's heir.

45. I Drive the Hands of Time

I drive the hands of time.
All nature I renew.
I change the world's clime.
A source of water, too.

In bed I'm often found
Or helping Jack ascend.
I jump, I leap, I bound –
March onward to the end.

I end this chapter with two heavyweight puzzles I call ***challengers***. The casual solver will probably be frustrated and should not attempt them. You will need to consider all of your riddle-solving skills using both your right- and left-brain functions. The answers (at the back of the book) will act as your "spotters" to avoid any injuries.

Challenger Puzzles

WARNING: Very Tough!	Beware of Doggerel

46. Four-Part Charade

My first is that which indicates
A fact or omen from the fates.

My second is supposition,
An expression of condition.

My third is nothing more than me.
My last - short inability.

My whole is full of meaning and
Important. Guess it if you can.

47. Easy Match

I am a good (though fair) example –
A delicate and wanton sample
Of dizzy, happy, flighty, bright and
Yet nimble energy that might land
Or happen suddenly to strike thee.
I come up less than normal like the
Soft way in which a thing is seen in
A window's uncomplcated meaning.
Although I'm knowledge-animated,
I'm not intense or hard or weighted
With serious expressions. Unstressed,
I crumble and am easy to digest.

Riddles Bibliography

I haven't found very many good sources of riddles. There are many books containing joke riddles, but most of those aren't fair puzzles. Here are a few sources worth looking into.

Dudeney, Henry Ernest. 300 Best Word Puzzles. New York, Charles Scribner's Sons, 1965.

Bellamy, William. A Century of Charades. New York, Houghton Mifflin and Company, 1894.
Google.com has a complete scan of the book available to view online.

Eckler, A. Ross. Answers to Bellamy's 500 Charades. ***Word Ways***, February 2006.

Eckler, A. Ross. Word Recreations – Games and Diversions from ***Word Ways***. New York, Dover Publications, 1979.

Espy, Willard R. The Game of Words. NewYork, Bramhall House, 1972.

Some Noteworthy Web Sites

www.catb.org/~esr/riddle-poems.html – Eric S. Raymond's Riddle-Poems, and How to Make Them

www.braingle.com/Riddle.html – New riddles from a variety of contributors

findarticles.com/p/articles/mi_hb346/is_1_39/ai_n29248064 – Eckler's article in ***Word Ways*** answering Bellamy's charades.

www.justriddlesandmore.com/riddles.html – Loads of Q&A riddles

www.dmoz.org/Games/Puzzles/Brain_Teasers/Riddles – dmoz open directory project
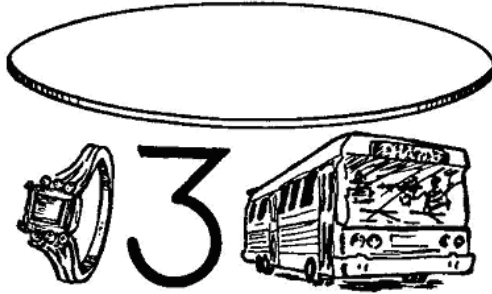
Chapter 3 – Discovering the Rebus

The illustration at the top of the page shows a disc over a ring, a three, and a bus. Combining these sounds, we arrive at "DISC-OVER-RING-THREE-BUS." We've used a rebus to define the title of the chapter.

Story

One of Shakespeare's contemporaries wrote a play entitled *The Alchemist*. The playwright was Ben Jonson (who apparently approved of silent H's in play titles but not in his own name). Jonson's play features a simple and superstitious tobacconist named Abel Drugger (presumably a piller of the community).

The plot line exposes how Abel is able to be duped into buying a placard which would magically attract people to his shop. In those days it seems they didn't have clearance sales, trading stamps, or even cash rebates.

The subtle designer of the fraudulent sign described the pictures that would cast the mystic spell on passers-by:

As thus: He first shall have *a bell* – that's *Abel*;
And by it standing one whose name is Dee,
In a *rug* gown; there's *D* and *rug* – that's Drug;
And right anenst him a dog snarling *er* –
There's *Drugger*. Abel Drugger, that's his sign,
And here's now mystery and hieroglyphic.

Although the sign may be a little hard to follow, it's not as hard to swallow as many TV commercials for headache remedies. (By the way, 4 out of 5 doctors recommend changing channels for fast relief.)

Needless to say, the fantastic picture puzzle had quite an impact on Abel's life. Whenever he left the world of drugs for singles' bars and nightlife, he was always asked, "What's your sign?" And he could answer, "Rebus!"

Warm-Up Exercises

Puzzle answers begin on page 205

A rebus is a picture puzzle that uses drawings, symbols, and sometimes even relationships between the objects pictured to disguise a word or phrase. What does the following rebus say?

48. Basic Rebus
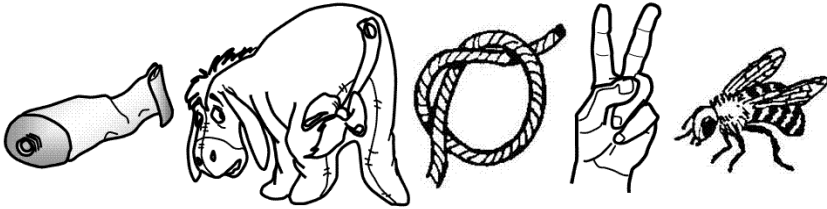
We see what looks like a toothpaste tube, Eeyore (the donkey from *Winnie the Pooh*), a knotted rope, a hand showing two fingers, and a bee. If we choose our words carefully and keep our minds open as we pronounce them, we hear "tube Eeyore knot two bee." This should trigger Shakespeare's line from *Hamlet*, "to be or not to be."

49. Rebuses *a la Concentration*

Rebuses reached the zenith of their popularity in the 1960's when *Concentration*, a TV game show, appeared in homes across North America. The puzzles were fun and easy enough for contestants (and the all-important viewing audience) to solve. On the previous page are two rebus puzzles I created in the style of the TV series.

Each of the two puzzles above, like every rebus on *Concentration*, represents a familiar phrase. The first drawing shows a woman pointing to her waist. There are also some little lines radiating from her waist. The game show used "radiation" lines to tell us which part of the picture was important. If I had shown only the person's waist, we wouldn't have recognized it. Anyway, the first word is "waist." The second drawing is that of a knot in a piece of wood. Then we see a "w" plus an ant. And the last picture is obviously a knot. As you've probably guessed, the proverb depicted by this rebus is "Waste not, want not."

It was common for Norman Blumenthal, the creator of *Concentration*, to use homophones (words that sound alike but are spelled differently) like "waist" and "waste." He would also construct words from smaller pieces like "want" from "w" + "ant". However, Norm was generally better at finding pieces that sounded like the final word.

The second of the two puzzles seems to deliver the following words: eye, half, a, bone, two, pick, with, and U. The word "half" was meant to represent the word "have." Similar sounding words were common on *Concentration*. Mr. Blumenthal wasn't afraid to throw an actual word into the puzzle when a picture would have been too hard for the audience to solve. I've used this approach by writing out the word "with." The answer to the second puzzle is "I have a bone to pick with you."

Norman Blumenthal called himself "King of the Rebus." I think he deserves the title after creating more than 8,000 puzzles for millions of home viewers.

About the time *Concentration* was going into syndication, a new type of rebus appeared – one in a neat little box. Let's try a few of these bite-size puzzles. Each boxed rebus represents a familiar phrase or idiom. I've included some hints (and then the answers) below the puzzles if you need them.

50. Boxed Rebus - Pictures
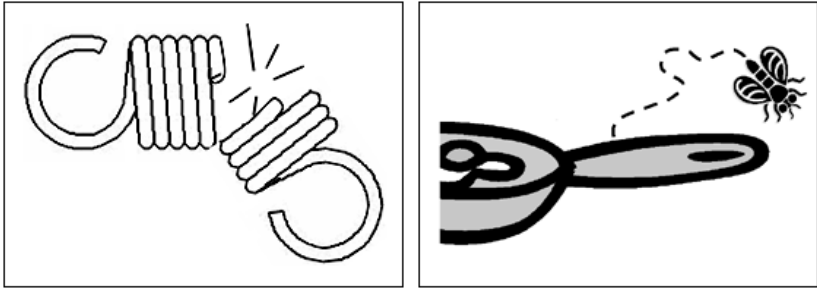
The purest form of rebus puzzle uses only pictures to represent words. The first puzzle shows a metal spring snapping; it represents the phrase "spring break." The second one shows a fly leaving the handle of a pan; it represents the phrase "fly off the handle."

51. Boxed Rebus - Words
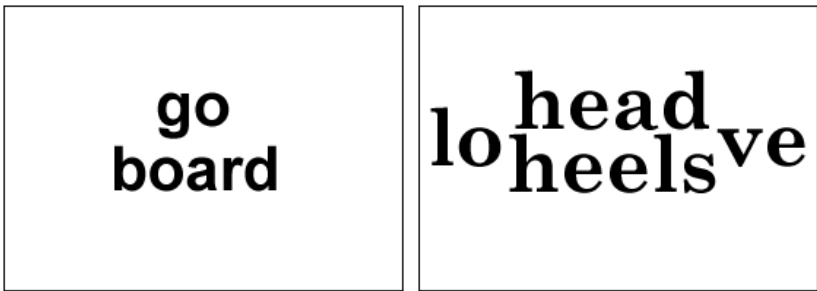
These two puzzles use only words and the relationships between the words to get their points across. In the first rebus, the word "go" is over the word "board"; the answer is "go overboard." In the second puzzle, "head" is over "heels" in the word "love." The answer is "head over heels in love."

> **Rebus Solving Tip #1** – Consider the **relationship between the objects** in the rebus. The relative positions may add words or parts of words to the answer, like "head *over* heels *in* love."

> **Rebus Solving Tip #2** – Try slurring the sounds together and recombining them with **different word boundaries**. For example, Grave+Eat+Rain may become "gravy train."

52. Boxed Rebus - Homophones

Here are some examples where the sounds of words, not the exact spelling, are used to form the answers. The pictures represent "sails" and "tacks." This leads to "sales tax." Then we see "Pete" four times followed by "ache." This represents "For Pete's sake."

Then we have two more homophones (sound-alikes). This time we say the name of a letter or other symbol to make the sound in the answer. The first shows a picture of a safe and the letter "T" among several numbers. The answer is "safety in numbers." The other rebus combines apple, love (as in "I love NY"), my, and "I" to make "apple of my eye." As in the "Petes ache" example above, word boundaries are relaxed to combine "apple love" into "apple of."

We have seen enough puzzles to develop another rebus-solving tip:

Rebus Solving Tip #3 – Identifying pictures can be tough.

a. Start by deciding whether a picture represents an object (noun) or an action (verb). This limits your choices and speeds up your solution.

b. Find someone who can identify the picture immediately (without any research). Learn the object's name so you won't have to ask again.

c. Here's a method for narrowing in on the answer:
    1) List words that seem to define the object or action pictured.
    2) Find a picture of the word and see if it matches the rebus picture.
    3) If not, use a thesaurus or crossword puzzle dictionary to suggest another word.
    4) Repeat steps 2 and 3 until you get the right word.

These three tips will get us started. Let's take a look at a few puzzles that introduce some other complications. Then you'll have a chance to try a few tougher ones on your own.

53. Boxed Rebus – More Tricks

yourself 🖌	k c i p the ✓
tostayuch	nyl gstocks

The first example involves an *action* performed on the words, not just simple relationships between two words. It shows "yourself" being painted into a corner. It means "paint yourself into a corner."

The next puzzle uses a symbol as part of the answer. "Pick" is going up followed by "the" and a "check" symbol; it represents "pick up the check."

The last two puzzles introduce some tricky variations on how words relate to each other in a rebus. In the first puzzle we need to recognize that the word "stay" sits inside the word "touch." It represents the phrase "stay in touch." The second uses the same idea to build a single word. Let's start on the bottom. Notice that "stock" is inside "gs." This builds the word "stockings" (stock in gs). Above "stockings" is "nyl." Therefore, we have "nyl" on stockings, or "nylon stockings." We see that the relationships can be used to build words like nyl+on and stock+in+gs.

54. Boxed Rebus – On Your Own

Thinking About Thinking

By now you've probably noticed the absence of brain-function icons on the puzzles in this chapter. This is because every rebus works the same basic functions. Every time you identify a picture, you use *visual skills* and the connection between the right and left sides of

your brain. You use *synthesis* to put the pieces together and *lateral thinking* to switch from one context to another. Most of this is wonderful right-brain exercise. But a rebus is still basically a word puzzle, so you call on *verbal skills* from the left brain. You also need m*emory* to recall the familiar phrases that are the answers. If you don't recognize the phrases, you can *learn* them (another valuable brain function).

55. Boxed Rebus – Getting Tougher

⊟/fect	hay hay hay hay
A ♂ 4 spring summer autumn winter	thjuste tinₑe

Hints for Boxed Rebus: Top row: Just right | So hard to find. Second row: More play | Seconds to spare.

A common rebus technique is to use symbols instead of pictures. Pictures are sometimes hard for an author to find and/or draw: they are often ambiguous and inexact. Symbols, on the other hand, are definitive and simple to draw. Drawing a picture of the word *at* is almost impossible, but it's very easy to use "@" instead. "Pound" could be depicted as a Humane Society shelter or as a hammer driving a nail, but it's simpler to use "£" or "#."

An interesting side effect of using symbols is that many of them have multiple meanings. This may make a puzzle much more difficult. A

zero, for example, could be named "cipher," "nil," "oh," "aught," "naught," etc.

0 = zero, oh, cipher, aught, naught, nil, nothing, zip

/ = per, shilling, slash, virgule, solidus, diagonal

X = "ecks", chi, 10 (Roman numerals),Christ (Xmas)

× = mark(s), times, cross, by, takes (chess capture)

- = minus, less, hyphen, dash, long (as in long ē)

′ = minute, feet, foot, prime

♂ = man, male, mars, Tuesday

= notes, music, sol fa, G F

SOME COMMON SYMBOLS with multiple meanings.

Mathematics, science, and business have hundreds of symbols that rebus designers could use. Astrology, the Greek alphabet, and miscellaneous typewriter keys are other sources of symbols. Chemistry uses letters as symbols for elements and chemical compounds (for example, NaCl is salt). A good place to start looking for an unidentified symbol is in the *Signs and Symbols* section at the back of a good-sized dictionary. If that doesn't work, there is always the Internet.

NV	envy	someone	Σ1
IV	ivy	Cairo	χρ
SAA	essays	Andes	&EE
EZ	easy	notarize	♪RII
NTT	entity	shortie	Ĕ
EEE	Tripoli	marquee	×E
B4	before	Siamese	ΨMEE
K9	canine	Lionel	♌L
NRG	energy	sensible	¢aႸ
@ –	atlas	club feet	♣′
NaCl E	salty	phony	☎E

SYMBOLS from science, music, astrology, the Greek alphabet, etc. can be used with letters, pictures, or by themselves to sound out words.

Brain Trainer

Moderate Workout

I know you're dying to get back to those boxed puzzles, but first I'll give you a chance to work out some very short symbol-based rebuses. This will be good practice for the really hard puzzles later.

56. Tangled in Your Shorts
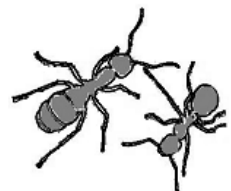
The author wants a few brief words with you. Here are 36 quick puzzles composed of symbols. The first 32 of them have one-word answers (although you may find alternative solutions with two or more words). The last four puzzles represent phrases that are plausible but not necessarily familiar. Although none of the words is particularly unusual, some of the symbols could be hard to identify without reference material. If you want an example, keep reading – otherwise start solving. Number 34 was meant to convey the message "Defeat any enemies you have."

1. YY	13. X0✓	25. K/
2. 10S	14. D0	26. aa
3. MT	15. 0E	27. ⌒✓
4. DK	16. ψψa8	28. ♮E
5. UU	17. ⊊E	29. .-
6. D¢C	18. ϒ8	30. ƛ -
7. $\frac{1}{4}\frac{1}{4}\frac{1}{4}\frac{1}{4}$	19. Xd	31. ΣX
8. X£	20. F'	32. •▬••
9. π/	21. XQQ	33. $\overline{oo}$T
10. ρ Z	22. N NaOH 10	34. D′NENMEEU$\frac{1}{2}$
11. D♩	23. ā	35. ⋀⋀⋀-Pb2a NaCl&⊣⊢
12. B10	24. FeE	36. ΣUρ PNNRρ♂✓

You may be more creative than I was. You may arrive at even better answers than I have at the back of the book. The answers aren't as important as the mental exercise. Any time your answer is as good as or better than mine, give yourself some bonus points and a pat on the back.

Now we return to the boxed rebuses similar to what *Games Magazine* calls "Wacky Wordies" and what Terry Stickels calls "Frame Games." You'll also find them under the names wuzzles and pictograms. This time I'll tell you the number of letters in the words of each answer. Top row: (1, 4, 4, 3, 1, 5, 5, 3) (2, 3, 5). Bottom row: (4, 2, 7, 3, 1, 3) (1, 6, 5).

57. Boxed Rebus - Reprise

More Solving Tips

> **Rebus Solving Tip #4** – Always **keep the solution in mind**. Don't fret about the pieces you don't know; work with the pieces you do know. Guessing the answer with partial information is often easier than identifying every picture.

In fact, this tip can be generalized into a puzzle principle:

General Puzzle Principle **Never lose sight of the overall goal.** It's easy to get caught up in the details, but be sure to keep the big picture in mind. Examine everything you know about the problem, and let your intuition build the answer as your left brain works with the details.

Rebus Solving Tip #5 – Empty speech balloons (like those used in comic books) are used to highlight a sound or word issuing from the pictured individual or object. Balloons can indicate "who" when said by an owl or "thee" when said by a Quaker pointing at you.
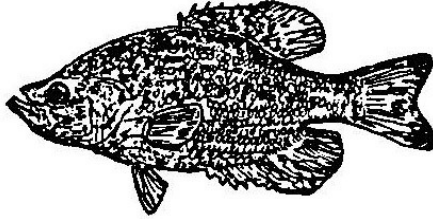
Rebus Solving Tip #6 – How precise is the picture? A more precise drawing probably calls for a more precise identification. This picture is probably not just a fish. It's more likely to be a sunfish, a crappie, or a *Poxomis*.

58. Boxed Rebus – Tougher Still
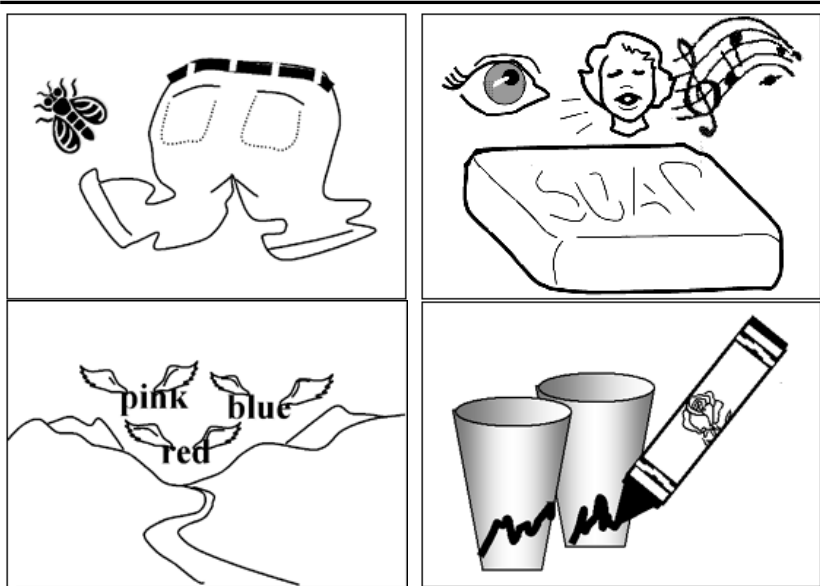
Hints for Boxed Rebus: Top row: Play by ear | But wait, there's more! Second row: A breeze | Looks good from here.

59. Maximized Pictures

Each of the following seven puzzles forms a familiar adage.
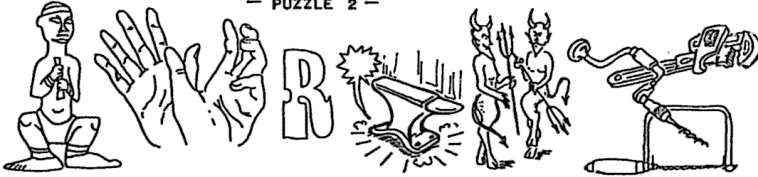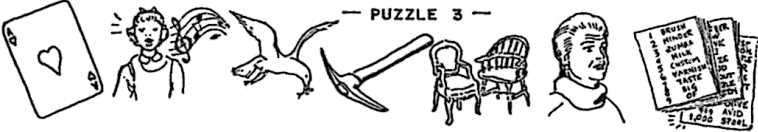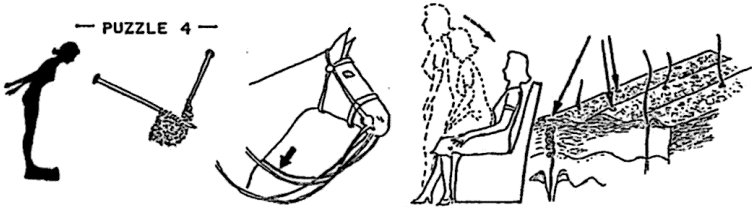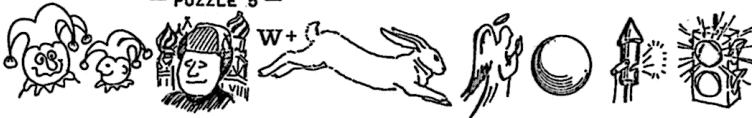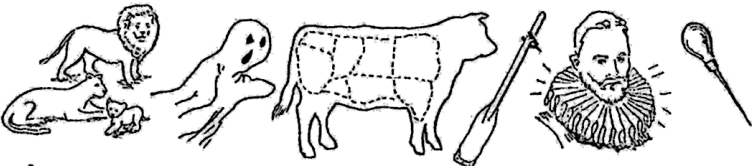
60. Howdunit?

This rebus tells a tale of international crime. It finishes by asking a question. Your mission is to solve the problem posed by the question. Punctuation is included to help you read the statement of the problem. Two celebrity pictures need to be identified: an etiquette expert and a former U.S. Senator.

The Cartoon Rebus

Synthesis is the right-brain function of putting things together like a jigsaw puzzle. To exercise your powers of synthesis, consider the *cartoon rebus*, a puzzle form that was popular before World War II and has been revived recently by *Games Magazine*. With this form of rebus you not only have to identify the pictures, you have to decide which pieces to use and what order to use them in. The best way to explain this is with an example.

Island (10)

CARTOON REBUS – Select sounds or things from the cartoon and put them together to form the name of an island (10 letters long).

With a cartoon rebus you gather syllables or words from the picture and put them together to form an answer that meets the category and word length. In this case we are looking for an island that is ten letters long. The pieces can be words or syllables spoken in speech balloons, objects or actions pictured, or anything implied by the cartoon. We see a man pouring gas into a car and an angry woman. We can piece together "mad" (the anger of the woman), "uh" from the speech balloon, "gas", and "car." The result is Madagascar.

The category and the length of the answer are always provided to get you looking in the right direction and to provide a way to validate that you got the right answer. The components of the puzzle are not necessarily pictured in the same sequence as the answer.

Now, here's your chance to try a few cartoon rebuses on your own.

61. Cartoon Rebuses

Singer and Dancer (7,7)

Book and Movie (4,2,3,5)
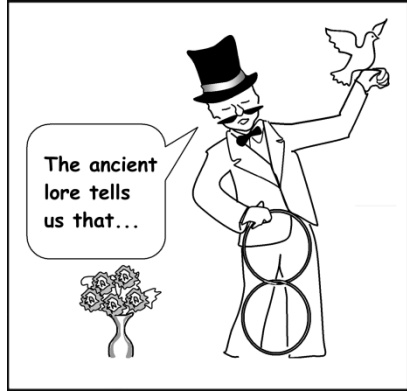
Canadian Place Name (8)

U.S. City (8,7)

European Capital City (8)

Singer/Actress (7)

Strenuous Training

The Alphabetic Rebus

The last type of rebus we'll consider is the ***alphabetic rebus***. In this puzzle we're concerned with the spelling, not the sounds, of the words. Every picture must be precisely identified and the letters added into or subtracted from the answer. Here's an example:

The first picture is a van; it won't work if we use words like truck, rig, semi, lorry, etc. The second picture is a derby (not a hat or a bowler). The last picture is a band. We do the arithmetic of the letters [V~~AN~~+~~D~~ER~~BY~~–BAND] and get "very." These can get *very* hard. Solving an alphabetic rebus is different from the others we've seen.

We need some new strategies when we allow words to be subtracted. If there are two occurrences of a letter we are subtracting, which one should we remove? We might take the first occurrence (I call this the 'first-delete' method), or we might take the last occurrence (the 'last-delete' method). Notice the difference between these two approaches in the following example:
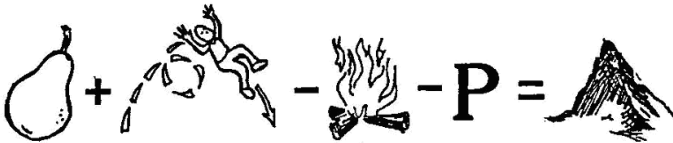
EXAMPLE OF FIRST-DELETE: ~~P~~EAR+~~FL~~I~~P~~-FIRE-P
By canceling the first 'P' we get "ALP" instead of "PAL."

Only the context of the puzzle can tell you which approach to take. However, I find that the last-delete method is more common (especially with long messages). This is because puzzle writers find it hard to choose 'subtracted' words that don't eat away at early portions of the puzzle using the ***first-delete*** convention.

Rebus Solving Tip #6 – In an alphabetic rebus, always start by assuming that the last occurrence of letters should be subtracted (**"last-delete" method**). The rebus creator must work much harder to use the first-delete approach, especially with long messages.

Notice, however, that the subtracted words also provide a benefit. The letters in the subtracted words must be found in the added words. This helps us confirm the exact words used to identify the pictures. Suppose we were unsure which words to pick in our first example. If we believe that "band" is the right word to subtract, we'll have to find those letters in the first two words. This means that "derby" must be the word for the hat, because we need a "b" and a "d." It also means that the truck must be a "van" to give us the "a" and the "n."

Rebus Solving Tip #7 – In an alphabetic rebus, use the letters from the "subtracted" words to help you determine the letters in the "added" words. Conversely, **use the added letters to help determine the subtracted letters**.

Rebus Solving Tip #8 – If you can't decide which of two possible words to use for a picture, **try the shorter word first**. A puzzle creator finds it easier to work with short words when trying to add and (particularly) subtract his way to a solution.

Almost all rebuses build an answer in sequence from start to finish. This gives us another tool; we can work backwards. If the last entry is an added word, we know that its letters will appear, in order, at the end of the answer.
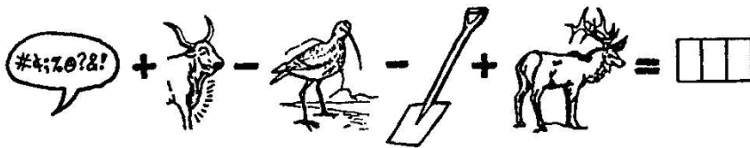
WORKING BACKWARDS can eliminate canceling entries.

Rebus Solving Tip #9 – In an alphabetic rebus, the last few pictures have more impact on the answer than the first. Start with the last entries and **work backwards** to see if you get any quick insights.

62. Letter Arithmetic Rebuses

Four alphabetic rebus puzzles await your talents this time. Each puzzle is independent of the others and covers what I think is a familiar phrase. They aren't too difficult, but if you want a hint, please continue reading. The first of the four puzzles can be solved using either first or last deleting of cancelled letters. Of the other three, only one rebus uses first-delete. Assuming that all the pictures shown contribute to the final answer, you should be able to recognize the first-delete puzzle without actually solving any of them. I explain how in the answers.

63. Boxed Rebus – Final Set

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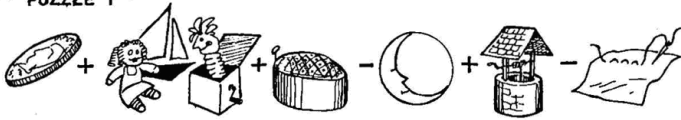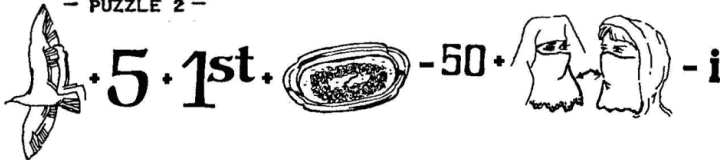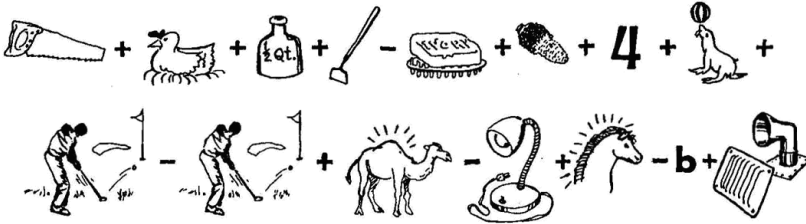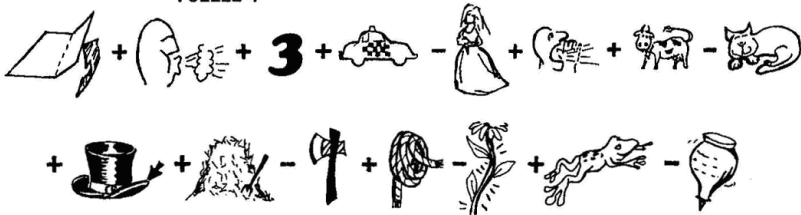
the ♥ do T
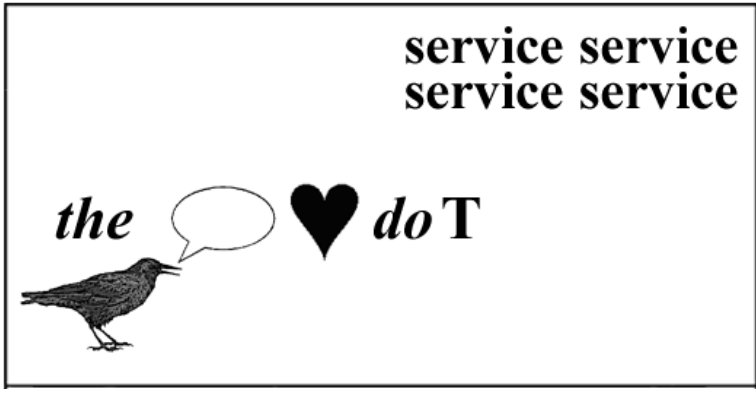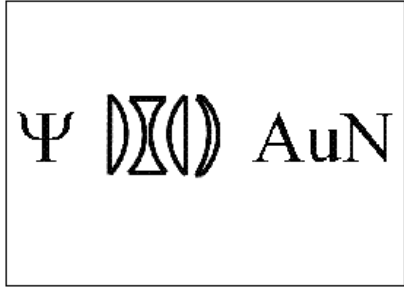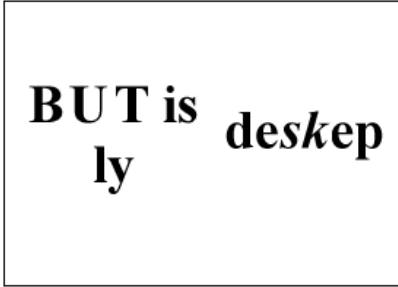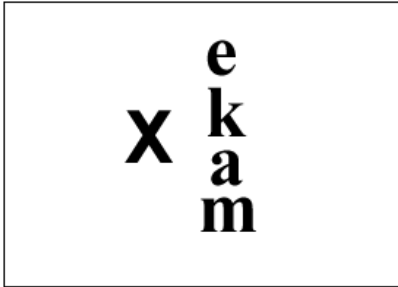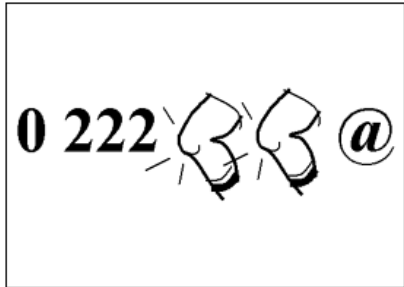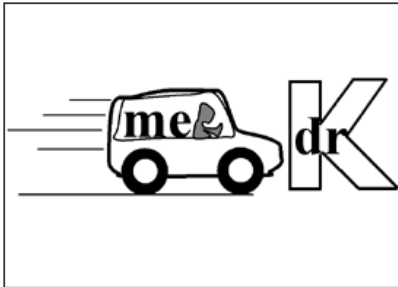
Hints for Boxed Rebus – Final Set: Top row: Designated? | Big deal. Second row: Bury the hatchet | Getting by. Third row: Guts are ugly? | How to be tactful. Bottom puzzle: Said at decoration.

64. World Literature 10

The titles of ten famous literary works are concealed in the following rebus puzzles. They tend to get increasingly difficult as you go along. Four of the ten are Pulitzer Prize winning novels; the other six are even better known.
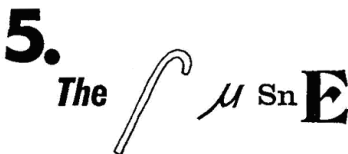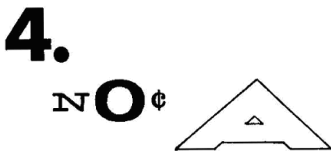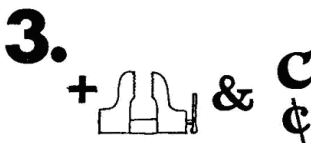
Let me warn you about these challengers. The casual solver will probably be frustrated and should not attempt them. The answers (at the back of the book) will provide hints and then answers.

Challenger Puzzles

WARNING: Very Tough!	Hazardous Area KEEP OUT

65. Hall of Fame

This rebus should lead you to a familiar saying. Identify each of these eleven people. I've included movie stars, political figures, a philosopher, and a publisher. Decide whether to use each famous person's first or last name. In the last picture, the name of the girl isn't what we want. The 'radiation' lines imply that we want you to fill in the missing word.

The pictures are as accurate as I could draw them. I tried to select poses showing the individuals at the height of their fame. They span about three centuries altogether.

66. Building a Word

Now solve this very challenging alphabetic rebus. Its answer is a single 6-letter word that is well known to all of us. The letters will be in the proper sequence and will not need to be anagrammed.
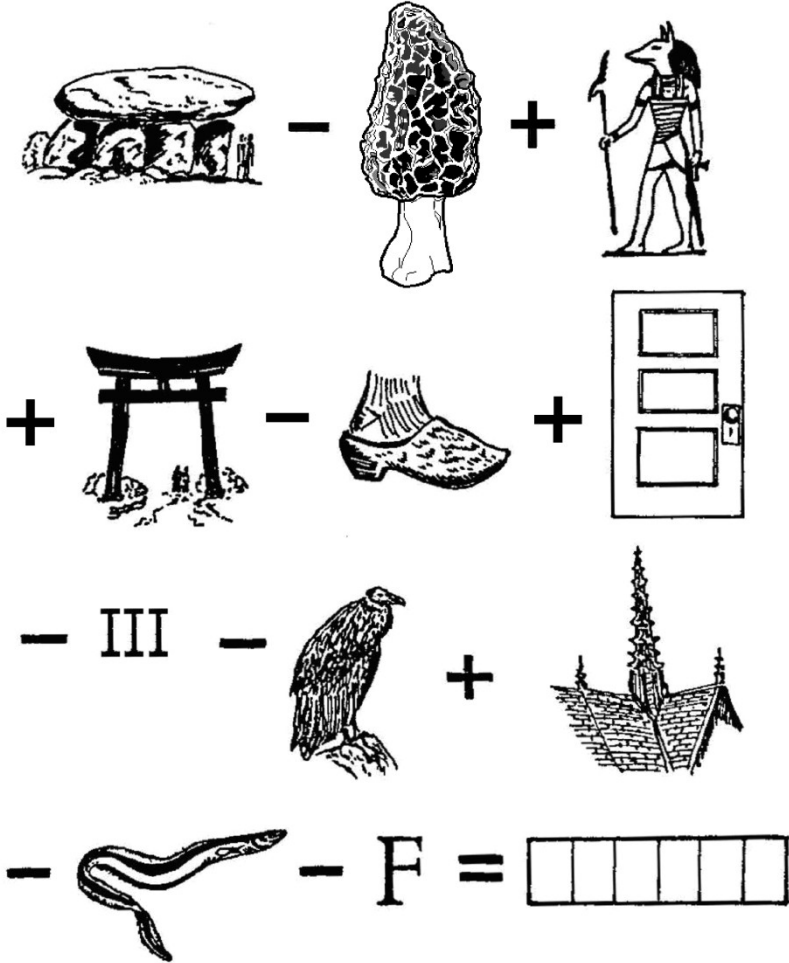
Rebus Bibliography

Blumenthal, Norman. <u>Scramble, the Picture Puzzles That Make You Stop and Think</u>. New York, Pyramid Books, 1976.

Games Magazine's Rebus Cartoons. Chicago, Playboy Enterprises, Inc., 1981-1986.

Games Magazine's Wacky Wordies. Chicago, Playboy Enterprises, Inc., 1979-1986.

Loyd, Sam. <u>Sam Loyd's Best Picture Puzzles</u>. Mineola, New York, Dover, 2005.

Richards, Karen C., Alan Stillson, Bernardo Recamán Santos, et al. <u>Brainteasers 195 Puzzles to Keep You Sharp</u>. New York, Sterling Innovation, 2002.

Stickels, Terry, Trip Payne, Mark Zegarelli, Michael Rios, Burt Hochberg, and Helene Hovanec. <u>Classic Shrewd Challenges</u>. New York, Main Street, 2005.

<u>Everything's a Puzzle</u>. New York, Unicorn Books, Inc. 1953.

Some Noteworthy Web Sites

www.puzzlesoup.com – Rebus puzzles they call pictograms

www.puzz.com/stickelsframegames.html – Some of Terry Stickels' Frame Games

www.fun-with-words.com/rebus_puzzles.html – Fun-with-words rebus puzzles

kids.niehs.nih.gov/braintpics.htm – National Institute of Environmental Health Sciences

www.smart-kit.com/scategory/brain-teasers/rebus-puzzles – New, challenging puzzles

www.wuzzlesandpuzzles.com/wuzzles – Rebus puzzles at Printable, Thinkable Fun.
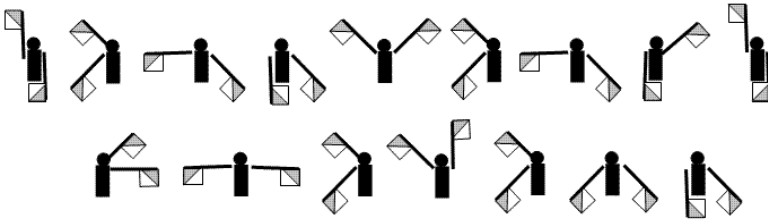
Chapter 4 – Disguised Writing

At the top of the page we see some little men and their flags. They are using semaphore code to transmit an encrypted message. It says "Disguised Writing."

Story

Germany may have underrated British Intelligence (the military information gathering agency – not the general level of English mental ability). 1917 found much of the world at war. The conflict had yo-yoed back and forth for three years, and everyone was getting tired of hearing how far it was to Tipperary. Britain (one of the "good guys") was trying its best to convince the United States that Germany was really acting quite naughty and deserved a good shellacking from the doughboys. But the argument with the most weight came on a little slip of paper from Germany.

Arthur Zimmermann, the German foreign minister, whipped up a super secret telegram and sent it to Mexico – in code. The cable asked Mexico to join the fighting against the United States in the event that the Yanks entered the war against Germany. In exchange, Mexico would receive Arizona, Texas, and New Mexico. (It seems that the Germans wanted to keep Hollywood for themselves.)

The secret message was, however, intercepted and decoded by British Intelligence who rushed the historic communication to President Woodrow Wilson. A Congress of doves became hawkish in short order and declared war (apparently with little regard for the Southwestern states). But history has shown that Mexico rejected the generous German offer; or perhaps, with public utilities being what they are, the telegram may not have arrived yet. At any rate, the incident illustrates one of the most fateful solutions of any code in history.

Warm-Up Exercises

The rebus puzzles in Chapter 3 disguised text messages with pictures. This chapter deals with other puzzles that hide messages. Let's jump into a few simple visual exercises.

67. Positive/Negative Text

Each of these messages has alternating black and white letters. The white letters appear in the negative spaces between the black letters. See if you can figure out what each word or phrase is hidden in the pictures.
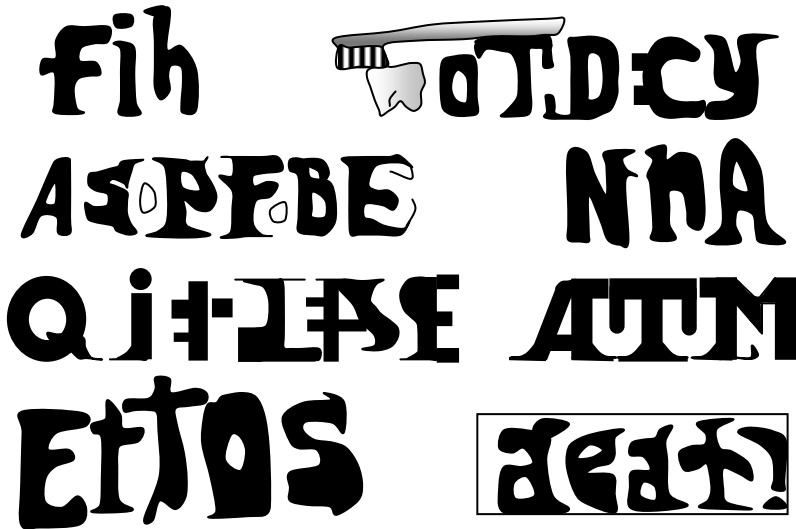
The first word has "f-i-h" in black and "a-t" in white; together they spell "faith." The next puzzle has "t-o-h-e-a" in white and "o-t-d-c-y" in black; together they spell "tooth decay." Next we shuffle together "a-s-p-f-b-e" and "e-o-s-a-l-s" to form "Aesop's fables." Then we have "n-n-a" in black and "i-j" in white for "ninja." Then we have "quiet please" and "autumn" (with the "n" inside the "m"). On the bottom row we see "e-t-t-o-s" in black and "a-a-j-e" in white; together they spell "eat at Joe's." The last one has white letters "f-c-f-c-s" and "a-e-a-t-!" in black letters; together they make "face facts!"

The visual processors of our brains switch between the black (positive) letters and the white (negative) letters. Meanwhile, our language processors struggle to form coherent words and phrases. It's sort of silly, but I hope you had some fun with it. It's even more fun to make up your own. Now, let's move on to some more traditional puzzles.

Next, let's look at a *disguised writing* puzzle that asks you to find the hidden words inside a sentence.

68. Animal Hides

Find the names of two or more animals in each numbered sentence below. Ignore spaces, capitalization, and punctuation. As a sample, here is the answer to the first puzzle: ape in "**A pe**ar" and gorilla in "**I**g**or ill a**t..." For some help, see the solving tips below the puzzles.

1. A pear made Igor ill at lunch.
2. Describe a very cute girl I once dated.
3. Have a go at pachinko, a lady's game.
4. What made the alpacas so wary?
5. Eskimo used to be a rare kind of rogue.
6. Bob is on TV to rebuff a lover.
7. He's almost rich with yen and dollars.
8. Hijack a luxury liner below Haleakala.
9. Exec ate shrimp a la king.
10. Steal jewel and grab earrings.
11. Standing on the north edge? Hogwash!
12. Magic owl is mentor to Isengard.
13. Jim Croce lottery winner is framed.
14. Mental exercise always develops a shrewd, large-size brain.
15. Will a man who came late do good work?
16. Bathe plant I germinated in renewal lab yesterday.
17. I knew a spy mole murdered by ninja guards.
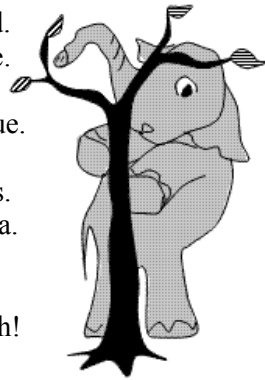
The last three puzzles have only one hidden animal, but the animal's letters are in reverse order. For example, "weasel" might be hidden in "...riles a ewe...."

18. Life is like a box of chocolates.
19. Use his foot? Nah, Pele uses his head.
20. What do you hate, eh? Crashing?

Solving Tip #1 – **Proper names** (like Igor) often signal a place where a word is hidden.

Solving Tip #2 – Don't forget to **look for small words** like dog, cat, or (in this case) ape.

Solving Tip #3 – Words can be **broken into three** or more pieces around small words like a or I.

Solving Tip #4 – Look for **unusual words and unusual sentence structure**.

Solving Tip #5 – Occasionally you may get a **word that is not hidden**, like alpaca.

Solving Tip #6 – **Words can overlap** other words; the same letters are part of multiple hidden words.

Solving Tip #7 – Look for **words that begin or end with unusual letters**, like Eskimo.

Solving Tip #8 – Find the hidden words **by the spelling, not by the sound**. For example, the "f" in "of" is pronounced like a "v," making it hard to recognize the hidden word.

69. Camouflaged Birds

Find the names of two or more birds in each sentence below. Ignore spaces, capitalization, and punctuation.

1. Some people grouse about swift action.
2. Clean up that goo seeping down until the area gleams.
3. Pigs wallow in offal constantly.
4. Goats wander off in chilly weather.
5. Cooking fish erased the odor of flaming onions.
6. Men, now long dead, domesticated the pig eons ago.
7. I got cobra venom from a GP (i.e., family doctor).
8. I'm flying to Rio, leaving on the second or third.
9. Give the toucan a rye cracker with animal lard.
10. Hold rake or similar thing and erroneously drop a rake, etc.
11. What a catastrophe as ants swarmed over our picnic - ran everywhere!
12. Look, I will remove them until zero binary digits remain.
13. Now renowned Cardinal Arkin read a gospel I can relate to.

14. A gullible, rustic hick entered to coldcock a tieless crook.
15. There among the aspen, guinea fowl crowded around Jay.

---

70. Bananas Splits

Carrying the idea of hidden words to extremes, I have written these sentences with incorrect spacing, punctuation, and capitalization. See if you can set them right.

1. Sophy (sic) I an healthy's elf.
2. The rear en one sob, Linda's, tho' sew how ill not see.
3. Comet ow her et hef Lavoris.
4. St. Rikew, "Hi, let heir on I shot."
5. I sane who use of tense ton woods up ports instead fast rein for cement?

---

71. The Mondegreen Cipher

Listen carefully. Since we can't make sense of these sentences sent to us, see if they make sense to you.

1. Call us paydays "paid."
2. Marion Hay strip pen tat liege err.
3. To scum pan 'neath resuck rowed.
4. Aisle bee holm fork wrist muss.
5. Mile of no snowbound soft I'm oars pace.

Mondegreens

Have you ever misheard or misinterpreted something that was said? As old age sets in, my wife and I are often befuddled by what we thought we heard the other person say. In *The Glass Menagerie* by Tennessee Williams, one character hears the word "pleurosis" and thinks that "blue roses" was said. This phonetic misinterpretation is called a ***mondegreen***.

A rebus often uses an intentional mondegreen in the form of homophones (as in "tube Eeyore knot two bee"). *Mad Gab*, a party game created by Terry White, has teams trying to decipher phrases by sounding them out. A TV commercial used this example: EYE MULL OF MUSH SHEEN. The person in the ad finally realizes that he is saying "I'm a love machine." It can be great fun to disguise a message this way.

Moderate Workout

Anagrams

Another way to disguise a word is to anagram it. To create an anagram, we rearrange the letters in a word or phrase to form another word or phrase. Some famous anagrams (dating back at least a hundred years) are:

the eyes = they see
dormitory = dirty room
astronomers = moonstarers

As you can see, classic anagrams are more than just the scrambling of letters. The fun often comes from associating the before and after versions with related or witty meanings.
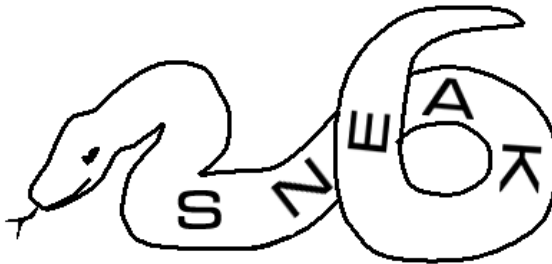
ANAGRAMS are spelled with the same letters in a different sequence, like SNAKE and SNEAK.

If you are going to do word puzzles and games, it pays to be good at anagramming. Anagrams help keep your brain young and flexible, and they can be done just about anywhere. If you saw the word Easter, you could think of anagrams reseat, teaser, seater, eaters, or see art. Even if some of the answers aren't real words, don't worry. Anagramming is an exercise – not a test. Life is a 'journey' – not a 'destination.'

Incidentally, if you don't care about the brain workout and you just want to know what anagrams you can get out of a set of letters, here's what you do: Visit www.wordsmith.org/anagram/index.html on the World Wide Web. This web site is the Internet Anagram Server (or I, Rearrangement Servant). This is like hailing a cab during a marathon. It will get you there faster, but it defeats the purpose of the exercise.

Next, let's try a few puzzles involving anagrams.

72. A Rag Man Solved This Puzzle   cat

Each of the following clues is like a crossword puzzle definition for a different word. In addition, at least one of the words in each clue can be anagrammed into the answer word. For example, "Puzzle written in prose" could be "poser," and "prose" is an anagram for poser. So, you have two ways to solve these problems:

    1) You can look for the word that should be unscrambled, and
    2) You can use the whole phrase as a definition.

1. Puzzle written in prose
2. Leader in a blackjack game
3. Scissors that a girl shares
4. Issued to each Marine lifer
5. Blood on satin
6. Thing following each day
7. One of a sandal's parts
8. What musical notes become
9. Polishing result
10. Without license to speak
11. Cuts away spare skin
12. Meat that takes chewing
13. Tries but becomes exhausted
14. What one of your neighbor's pets might be
15. Each muscle pain
16. Below the bicep
17. A signed mechanical creation
18. Stem the tide of fat
19. Less cause of fears
20. One of these papers
21. Relives old capers
22. Thoughts (aside from old ones)
23. A tattoo's contribution to the skin
24. Refused indeed
25. Gems not strange or rare
26. What a difficult quiz ought to be
27. A figure relating three lines

28. A nutrition tip about protein
29. Direct extension of a loan
30. A faster aerial way to machine-gun
31. Found in some pastel skirts
32. Gunman's shot from the pines
33. Dangling fingers of threads
34. Worshipping adroitly graven images

73. Double Exposures

From each picture, identify two (or more) items that are anagrams of each other.
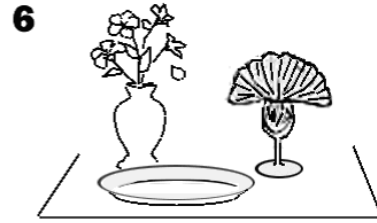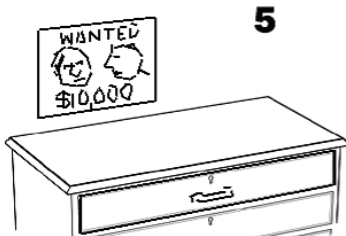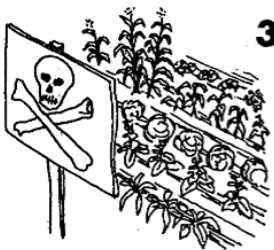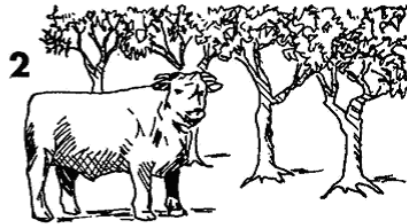
Cryptograms

The most common form of *disguised writing* puzzle is probably the **cryptogram**. This is actually a substitution cipher that substitutes one alphabet for another. Julius Caesar is said to have created ciphers by shifting the letters in the alphabet. For example, in English you could use a two-letter shift to encode a message. Then "A" would be represented by "C", two letters higher in the alphabet.

Message: **B E W A R E   T H E   I D E S   O F   M A R C H**

encode (encipher)   decode (decipher)

Cipher: **D G Y C T G   V J G   K F G U   Q H   O C T E J**

A SINGLE ALPHABET SUBSTITUTION CIPHER
replaces each occurrence of a letter in the message with one and only one cipher letter or symbol.

We'll develop some solving tips as we go along, but first why not try a puzzle and see how you do? I created a list of desserts and then scrambled the alphabet so that every letter is represented by a different letter. The resulting list is shown below.

74. Just Desserts
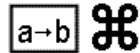
The names of 14 yummy desserts were encoded using a substitution cipher (a cryptogram). Figure out the letter reassignments and decipher the original list.

```
HAVYIH
JTCBTGT
MINTU MRI
XRUXIYJYITL
JTUTUT HMBRD
NRUUTAVU YVBB
MITNF NVJJBIY
TUXIBQVVL NTCI
TMMBI DEYUVGIY
DTMRVNT MELLRUX
QVYDEUI NVVCRIH
XBTPIL LVEXFUED
NFVNVBTDI INBTRY
RNI NYITA HTULORNF
```

Because this is our first cryptogram, let's walk step-by-step through the answer. Start by listing some well-known desserts. You'll probably find "PIE" and "CAKE" somewhere on your list. Are there any three- or four-letter words in the list of encrypted words? Yes, "MRI," "RNI," "YVBB," and "NTCI." If "MRI" is PIE, then "NTCI" could be CAKE; the two words share a final letter. "RNI" is less likely to be PIE, because it is at the beginning of a three-word phrase. If "MRI" is PIE, then "RNI" starts with "I" and ends with "E." It could be ICE. Our guesses of PIE, CAKE, and ICE seem to be confirmed when the word after ICE ("NYITA") matches with CREAM.

So far, the letters we think we know are:

```
Puz: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ans: M   K         E       P C       I   A           R
```

We substitute the letters we know for "MINTU" PIE and get PECA_ PIE. The letter U must stand for N to make this PECAN PIE. We also notice that the first word in the fifth entry (JTUTUT) has a strange letter pattern. It becomes _ANANA, which is surely BANANA. You've probably guessed the word following BANANA ("HMBRD" which is _P_I_), but we'll come back to that later.

Next we see another entry with many of the known letters: MITNF NVJJBIY. Filling in the known letters, we get PEAC_ C_BB_ER. This must be PEACH COBBLER. We now know 13 of the letters.

```
Puz: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ans: M L K     H   E B     P C       I   A N O       R
```

We know most of the letters in the second entry (JTCBTGT). It translates to BAKLA_A. Even if you are not familiar with BAKLAVA, you can easily find the word in a dictionary and realize that G stands for V. Next, let's look at TMMBI DEYUVGIY. If our guesses so far are correct, we get APPLE __RNOVER. The second word is TURNOVER. We've added some important letters to our key:

```
Puz: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ans: M L K T U H V   E B     P C       I   A N O       R
```

The fifth entry is now BANANA _PLIT. Obviously, H stands for S. Let's see what the answers are so far.

```
SMORES
BAKLAVA
PECAN PIE
_IN_ERBREA_
BANANA SPLIT
CINNAMON ROLL
PEACH COBBLER
AN_EL_OO_ CAKE
APPLE TURNOVER
TAPIOCA PU__IN_
_ORTUNE COOKIES
_LA_E_ _OU_HNUT
CHOCOLATE ECLAIR
ICE CREAM SAN__ICH
```

FORTUNE COOKIES and ICE CREAM SANDWICH stand out. That leads to TAPIOCA PUDDING, GINGERBREAD, and ANGELFOOD CAKE. Finally, we get a GLAZED DOUGHNUT, even though the Z doesn't appear anywhere else. The final translation key is:

```
Puz: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ans: M L K T U H V S E B - D P C W Z F I - A N O - G R -
```

Another way to approach this puzzle would be to find the word "CHOCOLATE" by looking for the pattern of C and O repeating. No list of desserts would be complete without some sort of chocolate. I'm getting hungry. Time for a snack break.

> **Solving Tip #1 – Look for letter patterns.** For example, "XABX" might be "that" or "says", and "AXYYXB" might be "letter", "better", or "common." "JYTYD" might be "never."

> **Solving Tip #2 – Consider letter frequency**. The most common letters in English text (E, T, A, O, N, R, I, S) are probably replaced by the most common letters in the coded message. Common letters at the end of words (E, S, T, D, N, R, Y) and at the beginning of words (T, A, S, O, I, C, W) are very different.

> **Solving Tip #3 – Look for common short words** like "a," "I," "the," "of," "to," and "and."

PERCENT FREQUENCY IN ENGLISH WRITING

LETTERS BY FREQUENCY

ETAONR I SHDLF CMUGY PWBVKXJQZ

45% of the total
70% of the total
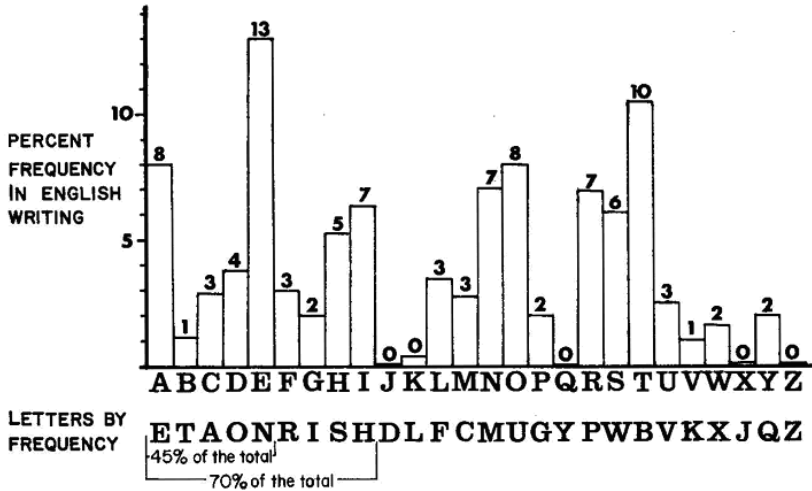
Solving Tip #4 – As you decipher the details, always keep your focus on the final answer. **Look for words and phrases in the context** of what you think the answer is. Keep trying to guess what the message says. The more you know about the content of the message, the faster you'll solve it.

Solving Tip #5 – **Use the punctuation** to limit your choices. X'DD is almost certainly "I'll." SREFAV'U probably ends in 'S or 'T. The words "and" and "but" often appear right after a comma. Questions (ending in a question mark) usually start with words like "what", "who", or "how."

Solving Tip #6 – **Try making a letter substitution and see if it works**. The trial-and-error method lets you see patterns developing, or failing to develop if the guess was wrong.

PERCENT FREQUENCY

FIRST LETTERS

TASOICWBPF
70% of the total

PERCENT FREQUENCY

LAST LETTERS

ESTDNRYFOL
85% of the total
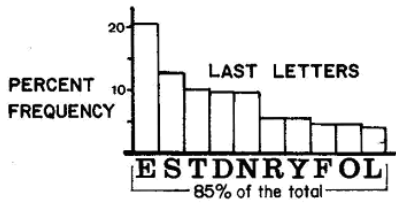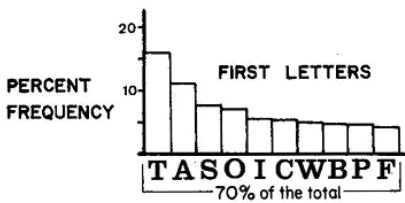
Your left brain analyzes the letter frequencies and word patterns, but be sure to let your right brain keep trying to see the message as a whole.

Working with substitution ciphers like this requires focus and attention to detail. We are especially prone to typographical errors when we deal with encrypted messages.

75. Gargled in Tarnsmission

Sending encrypted messages requires strict accuracy and attention to detail. A minor error in coding or decoding can change the entire meaning of a sentence. Here is an example: "The weaponry on board the submarine was unclear." By switching the order of the first two letters of the last word, the point of the message changes radically; the submarine is carrying <u>nuclear</u> arms!

Consider the sentences below. In each case a minor error has changed the meaning of the original thought. Try to identify the letter that was added, changed, dropped, or transposed to alter each message. You may even come up with better answers than I have intended. Never underestimate the power of errors.

1. My doctor recommended a seventy-two hour feast.
2. The eagle glided slowly downward when the wings that were supporting him dropped off.
3. James laid a tarp between the trees where the hunters would probably encounter it.
4. His coma lasted five years and improved his appearance until the very end.
5. Everyone concentrates silently as the deaf mute sings his answer to the judge.
6. The neighbors' nosiness made us call the police.
7. Walter painted each page of the new book with jet black ink.
8. With a good sewer, tools are needless.
9. His attorney could have gotten him freed if the defendant hadn't taken that witness stand in court.
10. His primary mission in life was understanding people.

Narrow in on the answer when a flash of insight fails to come. Keep limiting the range of possible answers. Analyze (break down) the puzzle into manageable steps. Continually peel back layers of the problem until only the answer remains.

General
Puzzle
Principle **E**

76. Office Gear

Here is a list of things you might find in an office (at least as of 2011). All words are encoded using the same substitution cipher. How many can you decipher? The words with an asterisk are proper names.

```
BKHDGSW

RGMRN JHKRTSW

KSGSDTMUS

YMXBSDHI

ISBN IWHJSWB

RMAASS YXL

YORWMBMAK* JOUIMJB

YORWMJHPS MPSU

EWMJU EHL GXURT

RXEORGS

NSVEMHWI

QSWMQ* DHDSW

RHGSUIHW

AHQ YHRTOUS
```

A while ago I tried my hand at comedy writing. I collected a huge list of clichés and idioms. Then I set out to write one-liner jokes about them. Although this activity isn't a "puzzle" *per se*, it can be a terrific mental exercise. I recommend joke writing as a form of mental gymnastics.

In each of the following puzzles I have encrypted two of my one-liner quips using the same substitution cipher to create a pair of cryptograms. I'm asking you to decode them. An asterisk (*) after a word means that the word is a proper name and begins with a capital letter.

77. Two One-Liners One a→b ⌘
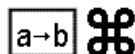
HYBBYIK TGA ZY KYGHYW OLBR G QLKK, ZJB NAHV

BJSSYIOGIY* HYBK VNJ KYGH OLBR G ZJIS.

L'E HGJURLAU GHH BRY OGV BN BRY ZGAQ. ORYA

BRYV KYY EV SGVTRYTQ, BRY BYHHYIK HGJUR BNN.

78. Two One-Liners Two a→b ⌘
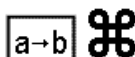
EJIL HOSJE POYI MTED TVR RXSD. JI BFXEI EJI

KFIVGKEOTP, UGE DJI SXE JIF MPTGDI OVEX OE.

EJI RIZOP WTRI WI RX OE. JI BTDV'E TMEGTPPL

KFIDIVE TE EJI EOWI, UGE O YVXB JI BTD

FIDKXVDOUPI.

79. Two One-Liners Three a→b ⌘
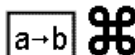
NRJJRFO JNM HBBTU RU KRFM, HQJ UBBFMS BS IXJMS

X VBIIMOM UJQZMFJ YRII ESBHXHIG NXCM JB SMXZ

JNMD.

R YXU EIXGRFO NRON-UJXTMU EXEMS-UJBFM-XFZ-

UVRUUBSU - DXTRFO DBFMG NXFZ BCMS KRUJ.

Strenuous Training

80. Roots

A foreign language can be used as a code, but it's hard to use as a puzzle. If you know the language, it is not a challenge for you. If you don't know the language, it is probably no fun to try to translate. To put everyone on an equal footing, I've made up my own language. It is made from root words (mostly Greek) common in the English language. Then I took well-known proverbs and translated them into my highfalutin language. Can you figure out these familiar sayings?

1. Cephalodyad essmelior than henocapit.
2. Nonplore hypergalactic upset.
3. Plutolatry is rhizomnicace.
4. Monornith immanual essepare diavian enshrub.

81. Bring Home the Bacon
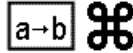
Abby has decided to save money by shopping at the super discount Mega Mart. The store cuts costs by not labeling any of the aisles, so the poor woman can't find the bacon. However, a sympathetic store clerk arranged the cans and boxes of merchandise into a cipher message. Solve it, and you can tell Abby where the bacon is.
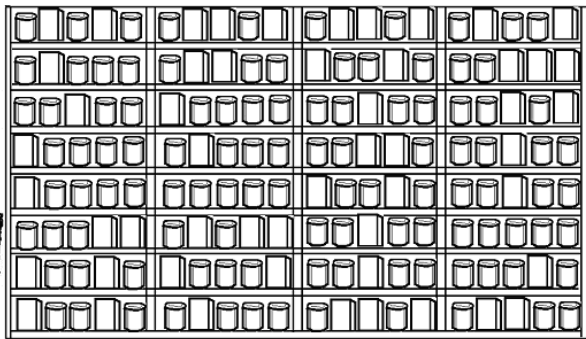
82. Inflated Bill (Or Is It George?) $\boxed{a \rightarrow b}$ ⌘
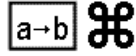
Wow! You don't even get any text to tell you what's going on.
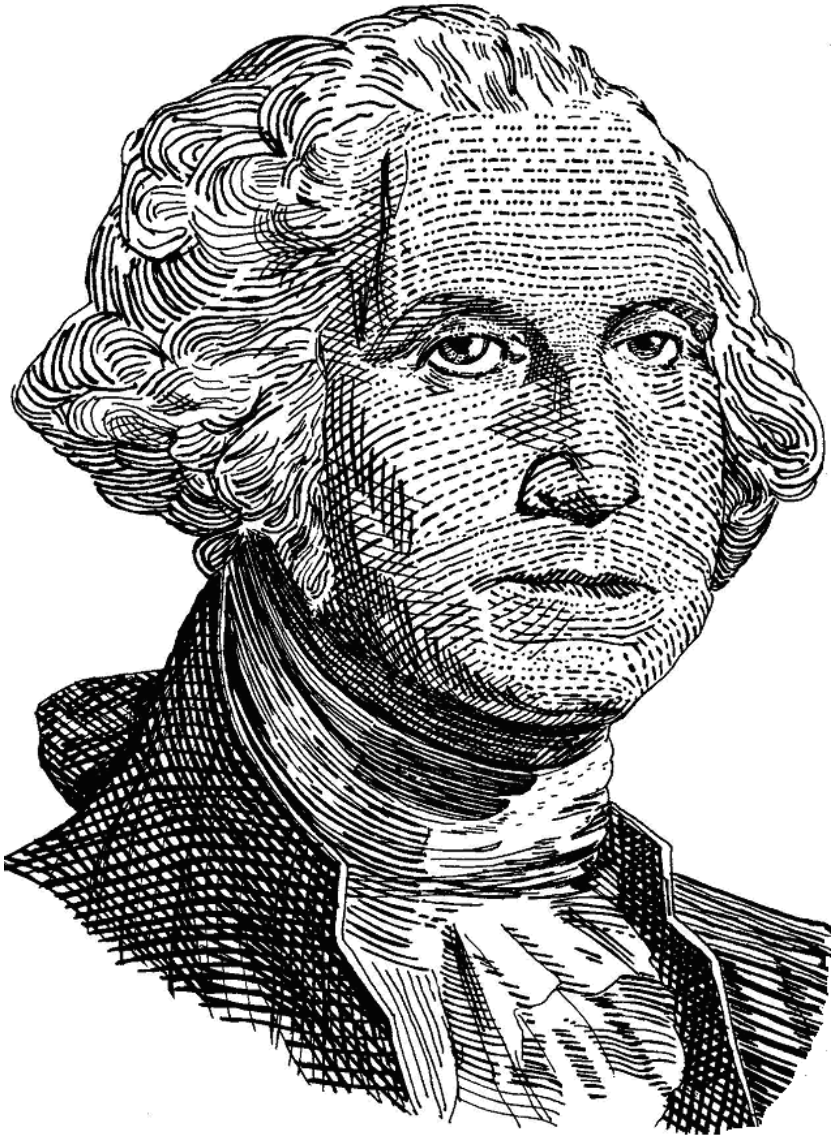
I end this chapter with some heavyweight puzzles I call ***challengers***. The casual solver will probably be frustrated and should not attempt them. You will need to consider all of your puzzle-solving skills using both your right- and left-brain functions. The answers (at the back of the book) will act as your "spotters" to avoid any injuries.

Challenger Puzzles

WARNING:
Very Tough!

Danger – Peligro
Gefahr - 危険

83. Amplitude Modulation

This puzzle is difficult. Even after you decipher the message(s), you have a problem to solve. You may have to do some research to spot the answer. Good luck.
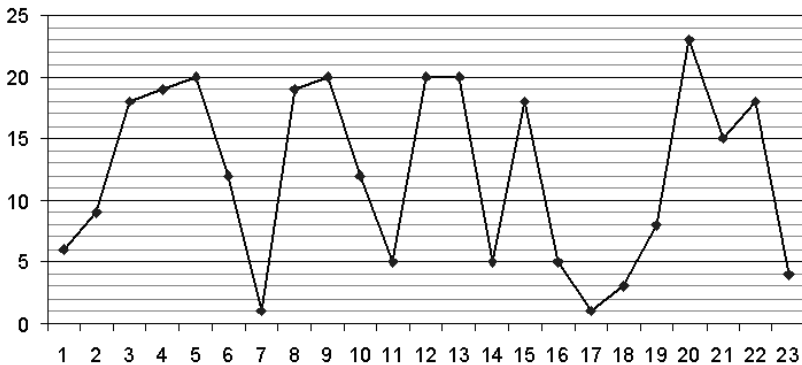
Extra church data: Yoga token in earmuff, if tidy, asceticism in steep altar trauma. Numb upper guru's coma – forego user life. Tenet ever who reared Mahatma, knife slew antiSlav elements. Which act is truth, instincts whereto rid?

84. Jigsaw Message 1

Your colleague left you a message. It's an instruction consisting of four four-letter words. He wrote it on a grid of squares and then cut the grid into pieces like a jigsaw puzzle. Your job is to rearrange the pieces and determine the message.

Hint: This is not as straightforward as you might think. Maybe you should turn down the job.
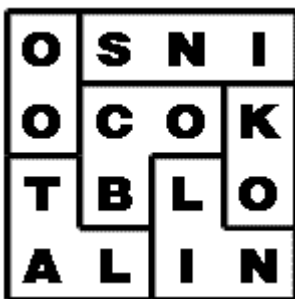
```
A  L  O  M
I  E  N  T
T  F  R  U
O  N  N  T
```

85. Jigsaw Message 2

```
O  S  N  I
O  C  O  K
T  B  L  O
A  L  I  N
```

Your colleague left you a message. It's an instruction consisting of four four-letter words. He wrote it on a grid of squares and then cut the grid into pieces like a jigsaw puzzle. Your job is to rearrange the pieces and determine the message.

Hint: This puzzle has a couple of diabolical twists to upset you.

86. Jigsaw Message 3

Your colleague left you a message. It's an instruction consisting of four four-letter words. He wrote it on a grid of squares and then cut the grid into pieces like a jigsaw puzzle. Your job is to rearrange the pieces and determine the message.
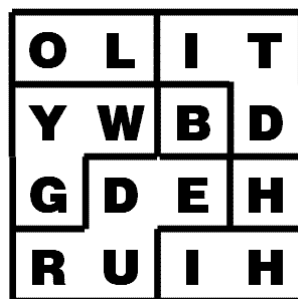
Hint: There's another trick here. You could be in good shape if you think outside the box.

```
O  L  I  T
Y  W  B  D
G  D  E  H
R  U  I  H
```

Disguised Writing Bibliography

Gardner, Martin. <u>Codes, Ciphers and Secret Writing</u>. New York, Pocket Books, 1974.

Zim, Herbert S. <u>Codes & Secret Writing</u>. New York, Scholastic Book Services, 1970.

Smith, Robert W. L. <u>Dictionary of English Word-Roots</u>. Totowa, New Jersey, Littlefield, Adams & Co., 1966.

Bergerson, Howard W. <u>Palindromes and Anagrams</u>. New York, Dover Publications, Inc., 1973.

Arnold, Henri, Bob Lee, and Mike Argiron. <u>Jumbo Jumble: A Big Book for Big Fans</u>. Chicago, Triumph Books, 1998.

Some Noteworthy Web Sites

www.wordsmith.org/anagram/index.html – Internet Anagram Server, a wonderful resource for anagrams

www.puzz.com/cryptos.html – Links to many cryptograms. Many are too short to be fair
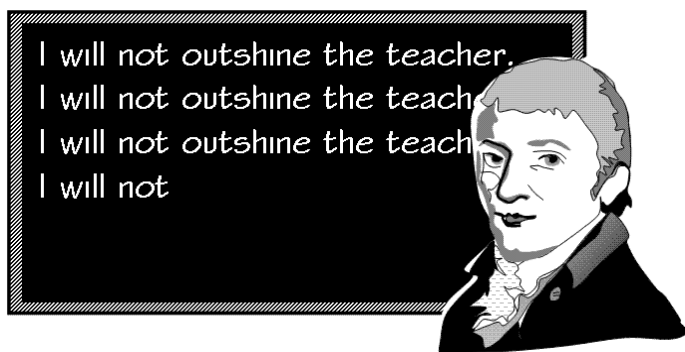
Chapter 5 – Math and Science Puzzles

Story

Carl Friedrich Gauss was born in Braunschweig, Germany. (I guess that makes him a Braunschweiger.) About the time George Washington was swearing in as President and while France was revolting, Carl was a young lad in primary school. One day in class, his instructor, J.G. Büttner, was fed up with the brats in Braunschweig; the teacher wanted a little "self time" to digest the events of the day. He gave the class a busy work assignment designed to occupy their attention for a long time.

It didn't work. The young Gauss completed the assignment in a few moments. The boy had solved a puzzle that Büttner didn't even know was a puzzle. The class had to add up all the numbers from 1 to 100 (or maybe it was 1000, I don't know how sadistic the teacher was). Surely that would take anyone an hour to do. But Carl said "Nein, Nein." No, his answer wasn't 99, but he did come up with the correct answer almost immediately.

Carl observed that $1 + 100 = 101$, which is the same answer as $2 + 99$ and $3 + 98$. He multiplied 101 times 50 and arrived at the answer 5050. His adding was 100% correct, and he didn't even need a pencil and paper. From this time on, everyone knew that Gauss was brilliant, and Büttner never got to chill out until Carl was shipped off to college.

Biographies of Gauss say that he went on to achieve tremendous mathematical breakthroughs. For example, he figured out how to draw a regular seventeen-sided figure with only a straightedge and a compass. I'm not sure why this was so important, but I know that I would have needed a pencil and paper! So I suppose it was tough.

Warm-Up Exercises

Puzzle answers
begin on page 226

Oh, No! Not Math!

For decades Martin Gardner delighted readers of *Scientific American* with puzzles that I often failed to understand. Math and science puzzlists frequently get my head spinning with incomprehensible theory and gut-wrenching equations. Math puzzles need to be fairly simple to keep my attention. Maybe I have MADD (Math Attention Deficit Disorder). Therefore, I have written this chapter with a common man's understanding of math and science. Let's ease into our subject with something that is barely math at all.

87. Back to Square One

Which square is most nearly twice the area of Square 1?
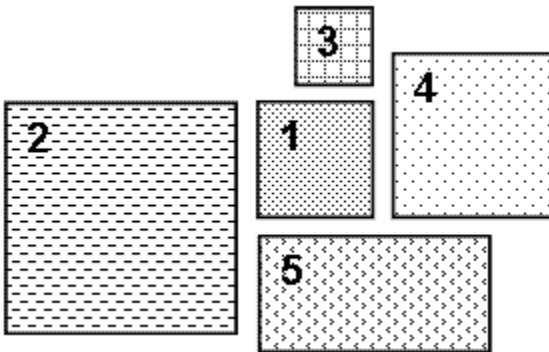
Square 2 is twice the dimensions of Square 1 but four times the area. Figure 5 is twice the area of Square 1, but it is not a square. Square 4 is the best answer.

> **Math Solving Tip #1**: **Read the question carefully.** Even easy puzzles can trip us if we don't pay attention.

88. Line Dancing

a→b

Immediately to your right is the (very attractive) instructor who is teaching you (and everyone else in line to your left) a line dance. The steps taken for each round of music are:

Step to the right, step to the right, step to the right, step to the left, step to the left.

That's not much of a dance, but I suppose you are just there to be around the (very attractive) instructor. You start the dance fifteen steps from the wall on your right. How many rounds of music can you dance before the wall prevents you from dancing?

Start by assuming that the (very attractive) instructor moves out of the way. This type of puzzle is what I call a **repetition trap**. Obviously, each round ends one step to the right. Wouldn't the answer be 15 rounds? No. We complete 12 rounds, and three steps later we reach the wall. But it doesn't interfere because we go left immediately and complete 13 rounds. Two steps later we hit the wall, two fifths of the way through round 14. So 13.4 rounds is the answer.

Math Solving Tip #2: **Watch for special starting and ending conditions** when puzzles have repeating cycles.

89. The Five Little Pigs
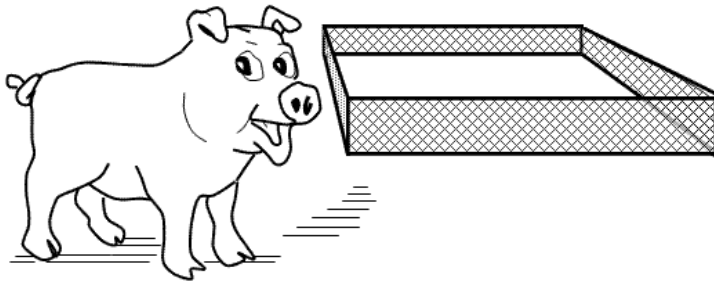
A farmer has five pigs in a large, square enclosure. He wants to partition the square into five separate areas so that each pig can have a space away from the other four. The supply store has a terrific sale on prefab enclosures right now. The enclosures can be any size, but their shape is always square. How can the farmer add one new, square enclosure to his existing square enclosure so that each of the five pigs can be isolated in an enclosed area of its own?

90. Circular Logic

Here is a classic geometry puzzle: Imagine a circle with its center at point O. At point B along the x-axis we draw a perpendicular line up to the circle and draw another perpendicular line to point A on the y-axis. If the radius of the circle is 8 and the distance from O to B is 5, what is the length from A to B?
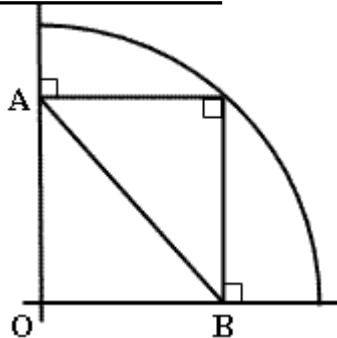
> **Math Solving Tip #3**: **Don't create constraints that aren't there.** Puzzles often try to direct your thinking and make things seem harder than they are. Allow your thinking to move in any direction to seek a solution. Be creative.

91. Cut the Chain
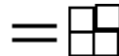
You have a small gold chain with 23 links (not a continuous loop). The market where you buy food has agreed to accept whole links (cut or uncut) as money. You want to be ready to pay any number of links (up to the full 23) on your next trip to the market. What is the fewest number of links you have to open or cut to be ready to pay any number of links from 1 to 23?

92. Sonic vs Shadow

A Boeing 747 jet plane is 231 feet long. When it is on the ground at noon (Sun directly overhead), the plane casts a shadow that is the same length, 231 feet. When the 747 is 23,100 feet (100 times its length) up in the air at noon, what is the length (to the nearest foot) of the shadow it casts? Assume that the plane is flying level, the shadow is cast on level ground, and the Sun is directly overhead.

> **Math Solving Tip #4**: **Try to avoid doing calculations**. Start by assuming that the problem has a simple answer. Only solve complicated equations when you have to.

Most general science puzzles are based on phenomena that don't act the way people expect they should. Don't always trust your first impression. After all, the situation is being presented as a puzzle, so there must be something puzzling about it.

93. pHoneyMoons

Explain why each of the pictured situations could never really be seen in the night sky.

Crescent moon
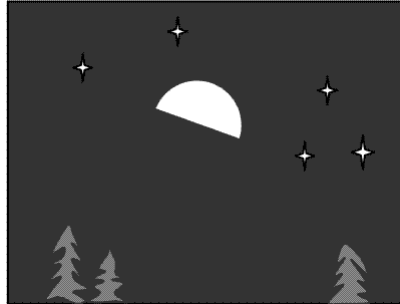
Half moon
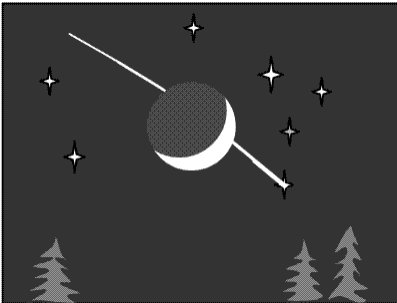
Shooting star behind the moon
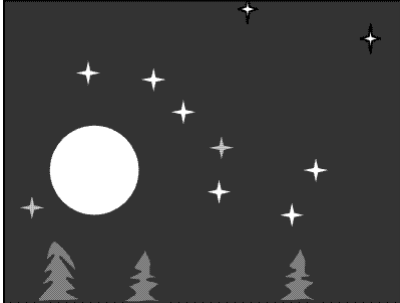
The Big Dipper and the moon

Kinetics, Kinematics, and Their Kin

Now let's take a look at a few areas of science that have inspired popular puzzles. Classical mechanics is a branch of physics concerned with how things move. Most people have at least a feel for how objects will react to various forces. We generally know how billiard balls will react to the tap of a cue stick or how gears and pulleys will move when forces are applied. Physics problems can become puzzles when you are asked to visualize how objects will move within a system.
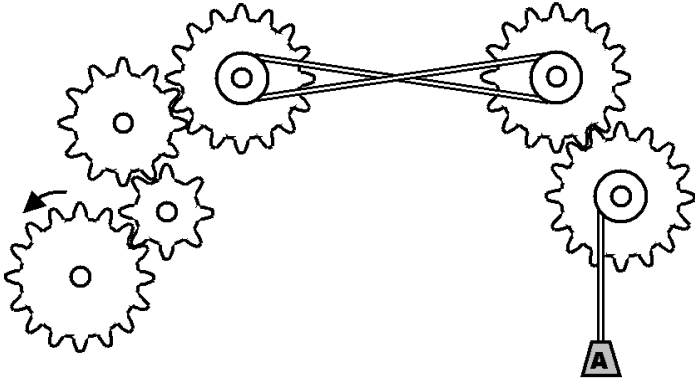
WILL THE WEIGHT (A) RISE OR FALL when the gear on the left is turned counter-clockwise?

Some puzzles show you a diagram of gears and pulleys and ask you to predict how the system will move. If one gear is turning in the clockwise direction, the gear it is meshed with will turn in a counter-clockwise direction. Two pulleys connected by an untwisted loop will turn in the same direction. If you twist the loop connecting two pulleys, they will turn in opposite directions. By the way, the weight (A) in the illustration will rise, because the gear on the right will turn clockwise and reel in the cord attached to the weight.

More complicated gear puzzles require you to know how gears of different sizes (more or less teeth) change the speed of rotation from one gear to another. Worm and bevel gears translate motion from one plane to another. For example, a bevel gear operating in the horizontal plane can mesh with another bevel gear in a vertical plane.
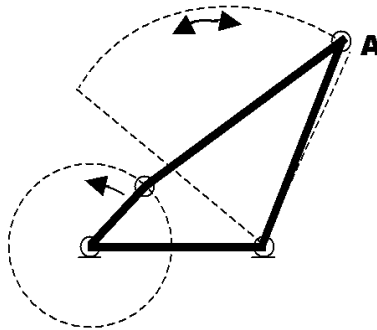
THIS FOUR-BAR MECHANISM translates circular motion into rocking motion.

Another mechanical device is a four-bar linkage. Four-bar mechanisms have (you guessed it) four bars connected at four pivoting joints. Usually two of the pivot points are fixed, and the other two are allowed to move. One type of four-bar (a crank-rocker) is illustrated on the opposite page. As the shortest bar (the crank) turns in a circle, point A rocks back and forth in an arc. Devices like this can be used to animate supermarket displays. Changing the length of the bars can radically change the path traveled by point A.

The basic trick to solving puzzles with any of these mechanisms is to carefully think through the situation. If you can visualize the devices moving and interacting, you can easily determine what will happen. If you can't see them moving in your mind's eye, slowly follow the forces and movements from one object to another, moving step-by-step through the diagram.

Use common sense but not necessarily your first impression. Carefully think through each puzzle's situation, and make sure you've considered the problem without jumping to a hasty conclusion. Here is another example.

94. Mean Speed
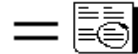
A train travels at 60 mph on a 10-mile trip from point A to point B. It immediately reverses direction and travels from point B to point A (10 miles uphill) at 40 mph. What is the average speed for the 20-mile round trip? Assume that the length of the train is negligible.

This is a puzzle because the answer is not as obvious as most people would think. Speed is the distance traveled divided by the time traveled. On the outbound leg of the trip the train takes 10/60 hours (10 minutes) to go from A to B. On the return trip the train takes 10/40 hours (15 minutes) to go from B to A. The average speed is 20 miles in 25 minutes, which works out to 48 miles per hour.

Science uses precise definitions. In fact, if you were asked what the average *velocity* was for the trip, you'd have to take into account the direction and the speed. The answer would be very different.

Moderate Workout

Many scientific puzzles require special knowledge that the average man-on-the-street might not know. Here is an example that isn't too bad. Even so, some might consider it unfair.

95. 5 × 5 × 5
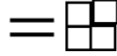
A cubic container with dimensions 5 cm × 5 cm × 5 cm has an open top. The container is filled with liquid mercury. You have a supply of solid steel spheres, each with a diameter of 2 cm. You carefully drop the balls into the mercury. Don't worry that some of the mercury spills out of the container. How many of the balls will be completely submerged in the mercury?

Leave your pencil and paper on the desk. The answer to this question hinges on a knowledge of the elements involved. It relies on the fact that mercury is heavier (denser) than steel. Think of the problem as equivalent to dropping ping-pong balls into water. The steel balls will float on the mercury and will not sink to the bottom of the container. So, none of the steel spheres will be completely submerged in the mercury. If you didn't know about the density differences, you would have to do some research.

> **Math Solving Tip #5**: **Seek help from reference sources** (including people) when puzzles require special knowledge.

With puzzles based on specialized knowledge, research into the subject matter is probably the only way for the uninitiated to work out the solution. Most of the time I just flip to the answer section to see what the answer is, but occasionally I take the challenge and do the research myself. I usually learn something in the process and have the feeling of uncompromising triumph.

I am not a scientist and don't know what makes for a fun puzzle among those wearing white lab coats. So, from here on, I will leave it to the chemists, particle physicists, and biologists to make up puzzles for each other. I'm sure they will come up with some terrific ones.

96. Matchstick Math 1
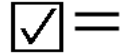
In matchstick math you are presented with an incorrect equation and asked to make it right by, for example, moving exactly one match. You may not drop a match diagonally across the equal sign to make it a not-equal sign (≠). Your task is to correct the **equation** by moving exactly one match in the following examples.

1. IV / II = III

2. X − IX = III

3. XV − IV = XX

4. X = VIII − II

5. V + I = XI

6. X − II = V

7. IX X V = I

8. VI = II − I

9. $X / II = II$

10. $LXII = L$

11. $XV - VI = II$
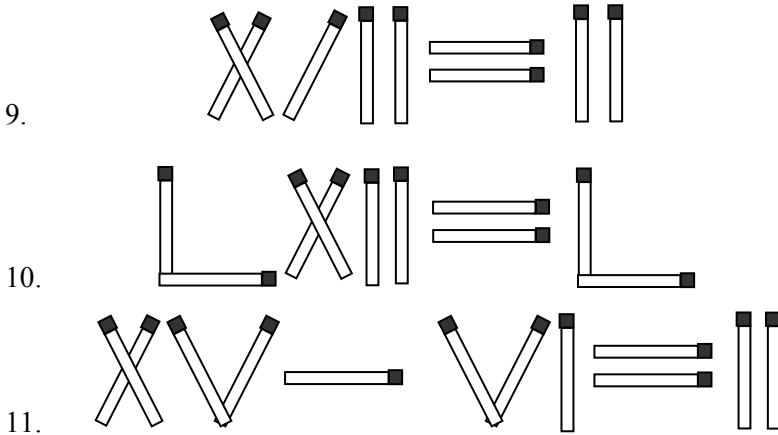
WARNING The following explanation reveals the answers to these puzzles as it explains some techniques to look out for.

1. IV / II = III → VI / II = III; "I" is moved from "IV" to "VI"
2. X – IX = III → XI – IX = II; "I" to other side of equals sign
3. XV – IV = XX → XV + V = XX; "I" across "–" to form "+"
4. X = VIII – II → X – VIII = II; move top of "=" over the "–"
5. V + I = XI → X + I = XI; move diagonal to change "V" to "X"
6. X – II = V → X / II = V; rotate "–" to form "/"
7. IX × V = I → X × V = L; put "I" at base of "I" to form "L"
8. VI = II – I → I / I = II – I; separate and rotate the left side of the "V" to form an "I"; the remainder of the "V" is now "/".
9. X / II = II → I × II = II; move the division sign ("/") to the left and make it a "I"; then look at "X" as "×" instead of "10"

Now we get to a few puzzles with more questionable answers!

10. LXII = L → C / II = L; put "I" at top of "L" to form "C"
11. XV – VI = II → XV – IV = 11; look at "II" as Arabic "11"

Here are some even more off-the-wall puzzles I have seen:

$VII = I → V\sqrt{I} = I$; use "I" and "V" to make a square root sign. This is clever, but the square root symbol ($\sqrt{}$) isn't exactly right.

$XXII / VIII = II → XXII / VII = \pi$; put "I" above "II" to form π. But 22 / 7 is only an approximation of pi. The equals sign is a stretch.

Measurement Problems

There is a fascinating class of puzzles where you are asked to measure something with very limited measuring devices. They may give you two measuring containers (4 liters and 9 liters) and ask you to measure out 6 liters of water. Another puzzle might involve sand-glasses (hourglasses or egg timers) for measuring 7 minutes and 4 minutes and ask you to measure 9 minutes. The possibilities are endless.

It's fun to come up with the right answer to one of these puzzles, but they often fail to give you that "aha" moment. Here is one of the most challenging and creative measurement puzzles I've seen:

> You have two fuses (igniter cords). Each will burn for exactly one hour, but the fuses do not burn uniformly. For example, after burning for ten minutes, they will not be the same length. How can you time 45 minutes?
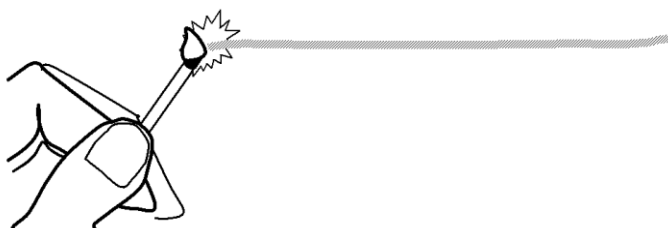
Mission (nearly) Impossible

How can you possibly measure anything less than an hour with these goofy fuses? Think about it. Before I reveal the answer, see if you can figure it out on your own. This is the big "aha" moment. After you come up with that answer, you have a standard measurement problem – sort of. The answer is to ignite the fuse at both ends simultaneously. Burning the fuse from both sides gives you a 30-minute timer.

Sorry. That still doesn't give you 45 minutes. What else needs to be done? Keep thinking. Why were you given two cords? Notice that 45 minutes = 30 minutes + half of 30 minutes. Light one of the cords at both ends and the other cord at one end only. When the first cord burns out (30 minutes later), the second cord will have thirty minutes left. Light the other end of the remaining cord, and it will burn out in 15 minutes more. Voila! You have 45 minutes. The best puzzles are ones that force you to think creatively, not just crunch numbers.

Letter Long Division

Here is a combination math and logic puzzle. Letters are substituted for the digits 0 through 9 in a long division problem. Your job is to break the code and determine which letters replaced which digits. Here is an example that you may want to solve before I explain the answer.

```
          ABC
    DEF )CBGHI
         GDH
         AJGH
         AAHF
          AFFI
          AFAH
           DI
```

The first subtraction (CBG – GDH = AJG) has G – H = G. H must be 0. The second subtraction (AJGH – AAHF = AFF) has H – F = F. H is 0, so we must borrow from the G. 10 – F = F. So F is 5. Here is what we have so far:

```
          ABC
    DE5 )CBG0I
         GD0
         AJG0
         AA05
          A55I
          A5A0
           DI
```

In the second subtraction we borrowed from the G then subtracted 0 and got 5. G must be 6. We also see that J – A = A. We know from the first multiplication that A is not 1. If A = 2, then J = 4. A can't be 3, because J can't be 6 (G = 6). If A = 4, J = 8. A can't be greater than 4, or J would be too large. The first multiplication shows us that A is relatively low (A × DEF is in the 600's). A must be 2, and J must be 4. So far we have:

```
          2BC
    DE5 )CB60I
         6D0
         2460
         2205
          255I
          2520
           DI
```

The third subtraction shows us that D is 3. The first multiplication becomes 2 × 3E5 = 630, which means E is 1. The first subtraction shows us that B – 3 = 4 and C – 6 = 2. B = 7, and C = 8. Every number except 9 is assigned to a letter, so I must be 9. The final answer is on the next page.

```
              278
       ┌─────────
315 )   87609
        630
        2460
        2205
         2559
         2520
           39
```

Dell puzzle books refer to these puzzles as *Word Arithmetic*. Dell makes them even more fun by having the letters spell a word or phrase when the letters are arranged 0 to 9. The Dell/Penny Press Web site (www.pennydellpuzzles.com) has more solving tips. Go to **Puzzler's Corner** and then to **Solving Resources**. Read the article entitled 'Help with Word Arithmetic and Word Math.' Jim Loy's web site has even more hints for solving these puzzles at www.jimloy.com/puzz/wordarit.htm.

97. Carpet Cut ⌘ ◉

You are asked to cut this 4×9 piece of carpet into exactly two pieces and fit them back together to form a 6×6 square. Be sure that you retain the pattern (as hideous as it may be) when you put the pieces back together.
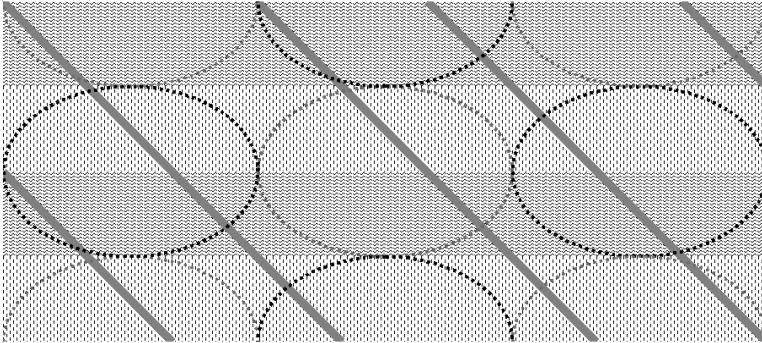
General Puzzle Principle

Leave it to your subconscious. Think about the puzzle before you go to bed. Then sleep on it. You'll be amazed how much help your subconscious mind can be. The next time you pick up the puzzle, the solution may be obvious.

Strenuous Training

Now we take you to the lab for a few puzzles.

98. The Germ of Truth
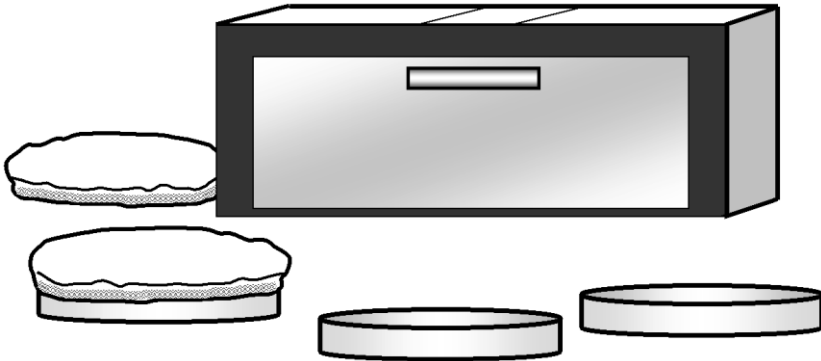
Dr. Von Brain is a germ-man scientist with a messy lab. The way he gets culture is by growing it in a dish. He prepares dishes filled with germs and incubates them in a sort of EZ Bake Oven until the culture grows active enough to study. He currently has three cultures (A, B, and C) to incubate. The problem is: his oven is already contaminated with all three cultures. If he incubates an uncovered dish, the other two germs from the oven will contaminate the pure culture in the dish.

He has found a couple of clean, new plastic shower caps that he can use to cover the dishes. The caps are flexible and have elastic bands so he can attach them securely over the top of a dish. Now Von Brain's problem is that he only has two of the shower caps. But he has three dishes to incubate. If he incubates the dish containing germ A with one of the caps, he will contaminate the inside of the cap with germ A and the outside of the cap with germs A, B, and C (from the oven). How can he incubate the three different cultures and not contaminate any of them with the other germs?

99. Matchstick Math 2
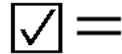
Now that you've learned the kind of sneaky stuff used in matchstick math, try these puzzles. Move one match to make the equation right.

1. LXII=X/V

2. XII=III−II

3. LXXIII=IX+X

4. L+XXI=VI
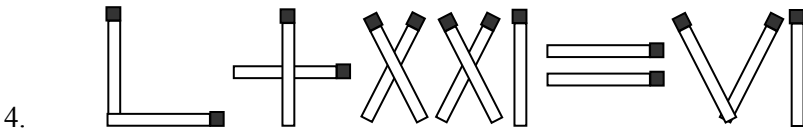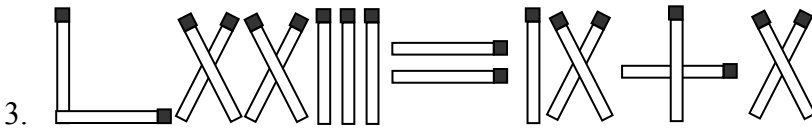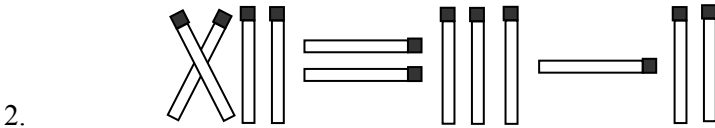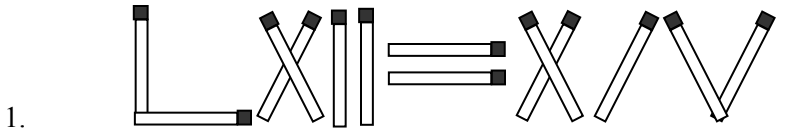
100. Water Marks

Challenge 1

You have two unmarked, clear plastic cans. When filled to the brim, one holds exactly 7 liters and the other holds exactly 3 liters. Both

From

To

6
5
4
3
2
1

2
1
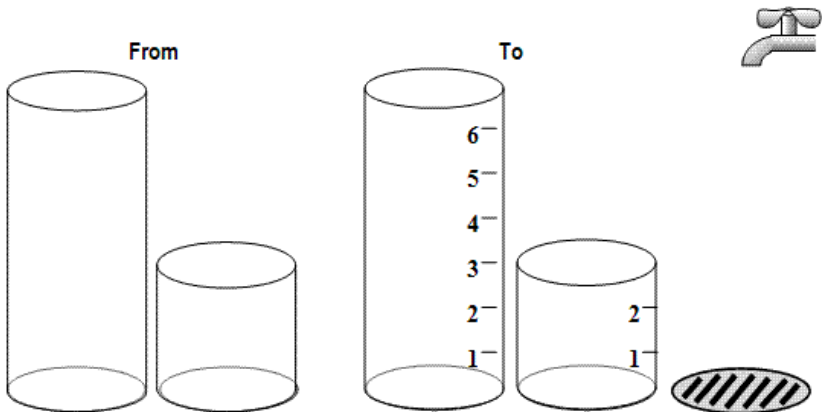
containers start empty. You wish to mark both cans with all whole liters (1 through 6 for the 7-liter can and 1 through 2 for the 3-liter can). You have a marker (to mark your calibrations), a faucet (an unlimited source of water), and a drain (where you can dispose of water as necessary). Your challenge is to mark all of the liter measures using the smallest number of "moves." A move is counted each time you put water into a can. Pouring water down the drain doesn't count as a move. [Note: Once you've made a mark, you can use it in subsequent measurements.]

Challenge 2

Now try the same challenge except: instead of using a minimum number of moves, minimize the amount of water discarded. Pouring water from one can to another doesn't count. Water left in the cans at the end of the marking process doesn't count either.

---

101. Murphy Goldberg

You've heard of building a better mousetrap – well, we're building a device to un-trap mice. If you've ever tried to build a Rube Goldberg machine (like the contraption pictured here), you know that lots of things can go wrong. Your assignment is to figure out all the things that won't work with this design and to suggest how each could be fixed.

Lift hook. Wheel turns as rope unwinds. Weight closes electrical switch. ❷

❶ Release bowling ball to roll down ramp and into bucket. This pulls the rope to lift the hook.

4 Pull string to remove cork, flood boat, and release steel weights. This raises level of salt water to close electrical circuit.

3 Motor pulls plug to release water. Sponge gets heavy with water; pulls rope down.

5 Motor turns arm to pull rope and rotate gear.

Pour 3 gallons of water into a pitcher, and put the pitcher on a pivoting plank. Release the hook, and pour the water into the empty cylinder — outweighing the other. **7**

6 Gears turn and reel in rope to release hook.

The added weight tips the balance and closes the switch. **8**

Motor turns reel to draw in cord as four-bar waves flag. **9**

10 Cord opens trap-door, and mice escape from hermetically sealed box.

2—   2—

1—   1—

102. Our Product Makes the Difference — a→b

Find two different ***integers*** (x and y) where $x \times y = x - y$.

103. Thirty "Four Fives" — a→b

5 5 5 5

A hundred years ago Sam Loyd asked solvers to express the number 100 using four 7's. In recent decades a popular puzzle asked solvers to express every integer from 1 to 100 using four 4's. Here's a similar challenge:

Using exactly four 5's (don't use any other digits, but feel free to use as many math symbols and punctuation marks as needed), express each of the integers from 1 to 30. For example, you could express 1 as $(5 - 5) + 5 / 5$. In my answers I had to use some techniques beyond +, –, ×, and /. Be creative.

104. Balance of Flour ☑ =

You have a balance scale. It has no calibrating marks - just the ability to balance two equal weights. You also have a 2 kg weight, a 5 kg weight, and a 50 kg bag of flour. Your task is to figure out how to measure 1 kg of flour in no more than two weighings. Then do the same thing for each integer weight from 2 to 50 kg, each in two weighings or less. So, there are really 50 separate problems to solve. Don't lose your balance.
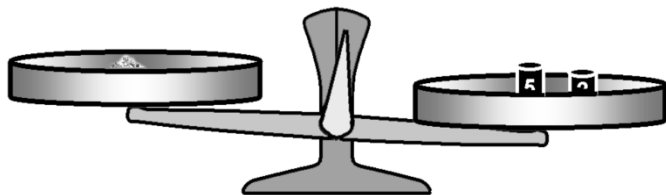
Challenger Puzzles

| WARNING: Very Tough! | | ⚡ DANGER ⚡ HIGH VOLTAGE |

105. Letter Long Division

Determine which digit (0-9) each letter (A-I) represents in the following long division.

```
                CCB
        ABC) DEFGB
             ABC
             ───
              HIG
              ABC
              ───
             ECHB
             ECHB
             ────
```

Science often involves research. Here's a test of our ability to recognize pitfalls and research the answers.

106. Say When
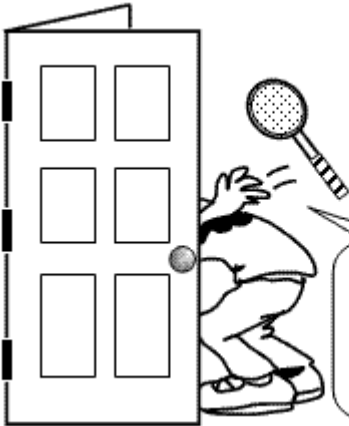
What is the exact date and day of the week, according to English reckoning at the time, of New Year's Day in the first year of the 18th century?

Honey, do we have any 18th century calendars?

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    available online at Project Gutenburg (USA)

Dudeney, Henry Ernest. <u>Amusements in Mathematics</u> (1917)
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Gardner, Martin. <u>The 2nd *Scientific American* Book of Mathematical Puzzles & Diversions</u>. New York, Simon and Schuster, 1961.

Kordemsky, Boris A. <u>The Moscow Puzzles</u>. New York, Dover, 1972.

Loyd, Sam. <u>The Sam Loyd Cyclopedia of Puzzles</u>. 1914
    available online at www.mathpuzzle.com/loyd/

Miller, Julius Sumner. <u>Miller-Grams II</u>. Garden City, New York, Doubleday, 1970.

Mott-Smith, Geoffrey. <u>Mathematical Puzzles for Beginners and Enthusiasts</u>. New York, Dover, 1954.

Webster, David. <u>Brain-Boosters</u>. Garden City, New York, The Natural History Press, 1966.

Some Noteworthy Web Sites

www.mathsisfun.com/puzzles/index.html – Rod Pierce's 'Math Is Fun' puzzles

www.cut-the-knot.org – Alexander Bogomolny's site promoting the fun of mathematics

brainden.com/puzzles-riddles.htm – Logic puzzles, measurement problems, river crossings

brainden.com/matchstick-puzzles.htm – Matchstick puzzles

www.jimloy.com/puzz/wordarit.htm – Jim Loy's great tips for word arithmetic (letter long division)

www.pennydellpuzzles.com – Dell/Penny Press solver tips for word arithmetic (letter long division)
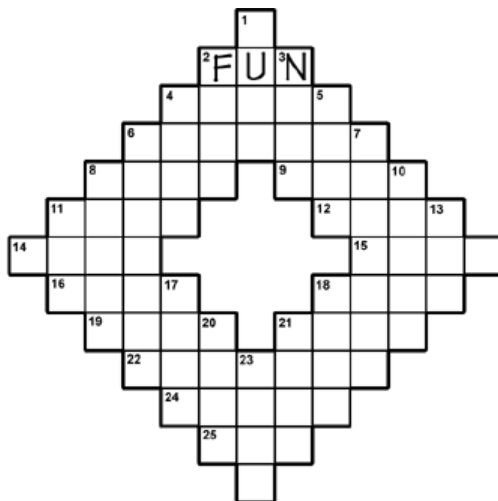
Chapter 6 – Crosswords

Story

he year was 1913: U.S. federal income tax had just been established. Buffalo nickels and peppermint Life Savers were introduced (but the latter picked up more lint jostling in your pocket). Future president Gerald Ford was born a King (Leslie King, Jr.); his name was changed later when his mother remarried. World War I was only months away. But all these things pale in comparison with what was about to happen in The Big Apple.

It was December 21. Arthur Wynne, an English-born writer for the *New York World*, was about to change the newspaper business in a way that no other journalist had ever done. He was also about to change morning commutes and breakfast table talk. He would set the machinery in motion for teaching us that an *ai* is a three-toed sloth or that an *epee* is a fencing sword. He published the first crossword puzzle. I suspect sales of pencil erasers doubled overnight.

His creation was a diamond-shaped puzzle that was only a fraction of the size of today's Sunday jumbos. It had a hole in the middle but no black squares. (I'm sure the publisher appreciated the savings of ink.) One word was pre-filled into the puzzle. That word was "FUN." Who knows? Maybe the genre would never have caught on if he hadn't supplied that subliminal suggestion. But with a name like "Wynne," Arthur was probably an expert at self-promotion. I suppose that

Margaret Farrar, Will Weng, Eugene T. Maleska, and Will Shortz
may have helped to promote this puzzle format a bit, too.

Warm-Up Exercises

Kriss Kross

      Before I sing the praises of crossword puzzles, let's
look at a simpler cousin of the noble crossword. I grew up with Dell
puzzle magazines. They were always my favorites. Dell had a
category that they called Kriss Kross puzzles. Other names I've seen
are framework, criss cross, fill-in puzzles, and crusadex. The puzzle
provides a word list (no clues to solve), and you must fit the words
into an unnumbered grid. This puzzle is a form of logic problem
where you rule out words that can't fit with any of the cross words.

No understanding of English is required; words can even be nonsense
words or numbers. As a child, I was easily frustrated by crossword
puzzles that had words and definitions I had never heard of.
(Actually, I still have that problem.) But fitting the words into kriss
kross puzzles was something I could do from a very young age.

Here are some hints for solving a kriss kross puzzle:

1. My strategy is to go for the easy situations first. Each time you can
   cross a word off the list, it makes for fewer possibilities later. The
   puzzle gets easier as you solve it.
2. The word list is usually grouped by length. If one of the groups has
   fewer entries, start by fitting some of those words into the grid.
3. Because it is easiest to scan the word list for words that start or end
   with a certain letter, work on intersections where two words start
   or end. Trying to find words with an "R" in the fourth position is
   much harder and prone to error.
4. If the place you are working is too hard, try somewhere else. Even
   if you have a word or two filled in, move somewhere else when
   you get stalled or bogged down with too many possible answers.
5. Look for unusual letters and try to eliminate them as crossing
   points.
6. If a guess seems to work but doesn't yield a unique answer, try
   something else. These logic puzzles have only one answer.

7. Be careful. Filling in wrong answers leads to disaster. Double check each answer before you move on.

107. Woven Words
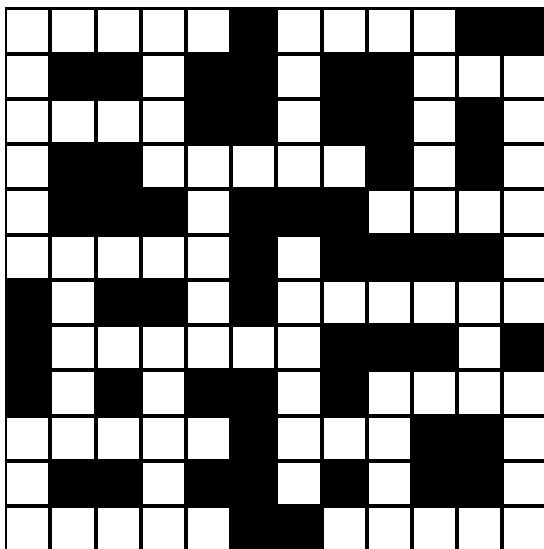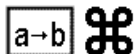
3 Letters	4 Letters	5 Letters	6 Letters
ERA	LAST	ALTAR	SALTED
LOU	RAIL	HYDRA	SUDDEN
RAY	RATS	LASER	TILTED
YES	ROUT	ONSET	TURRET
	SASH	RATIO	UNTOLD
	SILT	ROAST	
	TART	TABLE	
	TOUR	TOOTH	
		TRESS	
		YEARN	

To solve the puzzle you could start with the 6-letter words; there are only five of them. Two of these words cross just to the right of the grid's center. The first letter of one word is the second letter of the other. Only UNTOLD will work as the Across word. SUDDEN and TURRET are possible Down words. LOU must cross UNTOLD, and either SALTED or TILTED shares D as the last letter. None of the 3-letter words end in T, so SALTED (crossing YES) must run down the right side of the grid.

There are only two 3-letter words left. RAY must go in the lower left corner of the grid because no 5-letter words start with E. ERA goes in the last 3-letter space. The unknown 6-letter word that crosses UNTOLD also crosses another 6-letter word. If the unknown word is TURRET, the last letter of the other word would be R. No 6-letter words end in R, so SUDDEN and TILTED can be entered in the grid. The last 6-letter word (TURRET) goes in the upper left corner.

Working from the lower left corner, we can quickly enter several 5-letter words until the reduced number of choices makes the rest of the puzzle easy. Notice that starting in the upper left corner bogs down in too many choices. Always look for the easiest places to start.

Crosswords

A crossword starts with a grid of squares. Your job is to put one letter into each empty (white) square so as to form words or phrases both *across* and *down* the grid. Letters are entered into the grid in capital letters and without accent and other diacritical marks. In this way the word résumé (job application) and the word resume (start again) are both entered as RESUME. In most puzzles the words are separated by blackened squares; occasionally solid bars define the boundaries of each entry; and on rare occasions the words are run together with no separators.

The shape of the grid is normally square, but it can be almost any shape (for example, Arthur Wynne's diamond-shaped puzzle in 1913). All of these differences are relatively minor. Two major elements really define a crossword puzzle for me:

1) Each letter is part of two entries (the **Across** and the **Down** answers), and
2) Clues must be solved to know what letters fill the grid.

Double Keying

Every letter in a standard American crossword puzzle grid is part of two answers (one word going Across, and one word going Down). The technique is called "double keying." Each letter is "keyed" (sometimes called "checked" or "crossed") in two different directions.

This is a powerful advantage over most puzzle formats. It gives you hints to the words crossing the words that you know. It lets you confirm or correct your guesses with cross entries. In short, it makes crossword puzzles less frustrating and more fun. Any time a crossword puzzle fails to double key a square, it weakens the puzzle.

108. Star Crossed

Find a four-letter word for each of the numbered pictures. Then enter the word, one letter per circle, into the diagram along the line indicated by the numbered arrow.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.
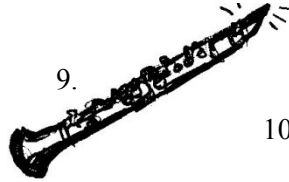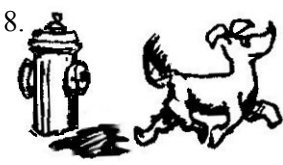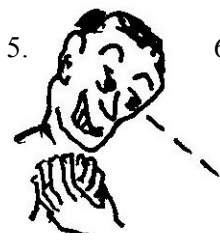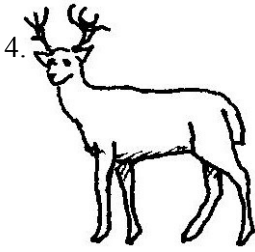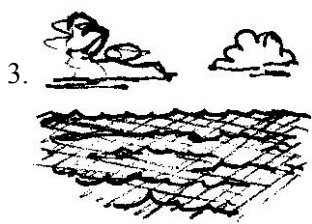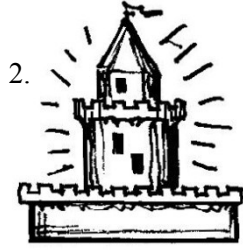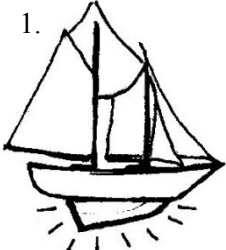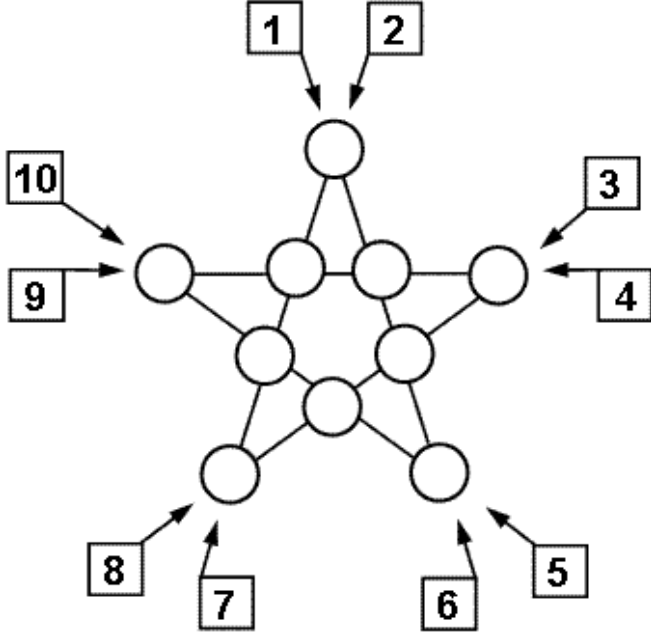
109. Word Square

1	2	3	4	5
6				
7				
8				
9				

Across

1. Answer
6. Eskimo dwelling
7. Imposter
8. Edgy
9. Alloy of iron and carbon

Down

1. Fissures in rock
2. Heron
3. Aircraft
4. Sucking insect
5. Alpine warble

Crossword Clues

The clues are the essence of a crossword. Each clue is its own little puzzle, and the grid is just a framework to tie the clues together and provide hints when needed. There are several types of clues:

Unique definitions:	40th U.S. President [REAGAN]
Ambiguous definitions:	Scale [climb? mount? range? ratio?]
Categories:	Nobel chemist, Sitcom star
Examples:	Peggy and Spike [LEES], or
	Fork, for one [UTENSIL]
Fill-in-the-blanks:	"__ Had a Hammer" (2 wds) [IF I]
Combining forms:	Language suffix [ESE], or
	Idol follower [ATRY]

Unique definition clues are sometimes a mixed blessing. They have an unambiguous answer, but they are often so obscure that most people would have to look up the answer in a reference book. The clue might ask for the first name of some obscure playwright or an actress who won an Oscar in a particular year. But still, if you have Google handy, you can get the exact answer with certainty.

Ambiguous definitions and *categories* clues have multiple answers possible. Typically, you can't be sure which answer the puzzle wants without knowing the cross words. Even if you are very familiar with the subject matter (Nobel prize winning chemists, for example), you may not know which one is expected. That makes these clues harder to solve and raises the difficulty of the entire puzzle.

Examples are sort of like inverse *categories*. They can be tricky as well as ambiguous. Consider the clue: Grant and others. It might be GENERALS, PRESIDENTS, CARYS, or something completely

different. Look for ending phrases like "for one," "and namesakes," or "for example." Be sure to consider multiple definitions of the words. Watch for proper names if the example is the first (capitalized) word of the clue.

Fill-in-the-blanks clues are generally the easiest class of clues. Of course, specific clues can be very tough if you don't know what they are referring to, but people often start with these clues. They can be ambiguous as well. Consider the clue: __ *diem*. The answer could be "PER" or "CARPE" or even "NGO DINH."

Combining forms refer to partial words like prefixes and suffixes. Sometimes the clue clearly states that it is looking for a *prefix*, *suffix*, or *combining form*. Other times it will use a gimmick like "follower" or "lead-in to" as an indicator. See the "idol" example above.

Crosswords that are rated as easy will warn you when the answers are abbreviations, multiple words, foreign words, and slang. Hard puzzles will leave you to figure this out for yourself. Often a puzzle will take the middle ground and hint at the fact that an abbreviation, for example, is being used. This hint takes the form of an abbreviation in the clue.

Easy, medium, and hard clues for "AMA"
    Doctors' group (abbr.) – stating that the answer is an abbreviation
    Doctors' org. – hinting at the presence of an abbreviation
    Doctors' lobby – no clue that an abbreviation is used

Easy, medium, and hard clues for "ETE"
    French for summer – stating that the answer is a foreign language
    Summer in Paris – hinting at the use of a foreign language
    Nice summer? – pun on the word Nice (a city in France)

Crossword clues can take almost any form including pictures and symbols, as we saw in the ***Star Crossed*** puzzle.

> **Crossword Solving Tip #1** – Start with a clue that you know the answer to, not necessarily the top left corner.

> **Crossword Solving Tip #2** – Then build words that cross the known entries.

> **Crossword Solving Tip #3** – Be ready to change one of your answers if nothing seems to match it.

Crossword Solving Tip #4 – Consider multiple meanings of words, particularly if the cross words suggest an answer you hadn't thought of.

Crossword Solving Tip #5 – Notice and think about the title of a crossword puzzle. A title hints at a theme.

110. Musical Medleys

Across
1. Tiny particle
5. Hold
10. Ride on snow
14. Trot
15. Main artery
16. Snug and warm
17. Amphibian
18. Boutonniere's location
19. 4840 square yards
20. America's heartland goes Swedish pop?
23. Track circuits
24. Second sight
25. Suppresses
28. Flying mammals
30. Your IRS guy, perhaps
33. Remove a knot
34. Shade of color
35. Front lower leg
36. Show with One Circle of Life?
39. Scottish tribe
40. Broken-down horses
41. Assistants
42. Barbie's beau
43. The Way We ____
44. Most mature
45. Turf

46. Fossil fuel
47. Siamese and
    Ethiopian royalty?
54. Cleveland's lake

55. Whiskers
56. Film ___
57. Cover with gold
58. Slowly, in music

59. Rams' mates
60. Chooses
61. Borders
62. Indulge to the full

Down

1. Singing voice
2. Removed
3. October birthstone
4. Disc-shaped
   ornament
5. Lively dances
6. Wanders
7. DoD's Internet
   founder
8. Plant stalk
9. Low fan-leaved
   tree
10. Rascal
11. Centers of activity
12. Pound of literature

13. Color one's hair
21. More healthy
22. Donkey
25. Charlatan
26. Dad's brother
27. Allen of furniture
28. Dirty water on ship
29. Black cuckoos
30. Scold
31. Yearns
32. Anxiety
34. Russian Emperor
35. Aircraft equipped
    for snow
37. Not fit to eat (var.)

38. Water nymph
43. Asian pan
44. Musical
    compositions
45. Kernels
46. Menu
47. Stumble
48. Sword handle
49. Require
50. Mob
51. River City state
52. Limit food intake
53. London derriere?
54. Conceit

Adding a Theme

Most modern crossword puzzles are somehow themed. At least a few of the entries in the puzzle have a common quirk, theme, or wordplay to them. Usually the longest answers have something in common. They may have a common subject and/or some common form of wordplay. For example, each of the following entries is unrelated except that it contains the name of a form of transportation:

> CARDIOLOGIST - CAR
> VANTAGE POINT - VAN
> SCHOLARSHIP - SHIP
> TRUCK FARMER - TRUCK
> RESTRAINING - TRAIN

A theme entry can be a play on words (like a pun or a spoonerism), or all of the entries could be the names of famous composers, inventors, comedians, etc. Another type of theme is the continuing quotation. Several of the longer entries in the puzzle (usually going Across) form one continuous quotation. The clues for these entries are not very descriptive: "Quotation, part 1", "Quotation, part 2", etc. You must work enough of the Down entries to get started on guessing the quotation. It is an impressive bit of constructing to fit a quotation into

a symmetrical puzzle, and the entries always seem to end at word boundaries.

Specialty puzzles are a type of themed crosswords. In this variation the constructor usually breaks the rules somehow. Examples include cramming multiple letters into a single square, extending entries beyond the borders of the grid, or dropping certain words from answers before they are entered in the grid.

Consider a puzzle that puts an entire word in a square. Four of the squares contain the first name of a different Beatle (John, Paul, George, and Ringo); you have to write small to fit them in. Each entry that crosses one of these squares must use the entire name in the appropriate location. Examples of entries could be PERILSOF-PAUL-INE, THE-RINGO-FTRUTH, or ST-JOHN-SWORT. Of course, the puzzle rarely tells you how it is going to break the rules. It begins to dawn on you when you try to fit JOHNSTOWN into a 6-square space.

Watch for themes in crossword puzzles. Many people consider themes to be the spice that keeps this hundred-year-old puzzle format alive and interesting.

General Puzzle Principle **G**   **Put yourself in the puzzle designer's shoes.** Why did he write or draw what he did? How is it different from what you'd expect? Those differences can often tell you where to focus your attention. Thinking like a designer tends to reveal solutions.

Diagramless

One type of crossword provides the solver with a set of clues but no grid. Diagramless crossword puzzles are like regular crosswords except that they require the solver to create the grid as well as fill it in. There are no numbers and no black squares on the grid. You are only told how large the puzzle is at its widest and highest extents. Otherwise a diagramless puzzle is an ordinary crossword.

Here is a step-by-step approach to solving a puzzle with no diagram. At the start we don't know where anything goes, so we should avoid using the blank grid provided with the puzzle until we figure out where things go. Use a piece of scratch paper (preferably graph paper) to do some preliminary work.

Moderate Workout

Here's a diagramless puzzle to get us started.

111. 11 × 11 Diagramless

a→b 📖
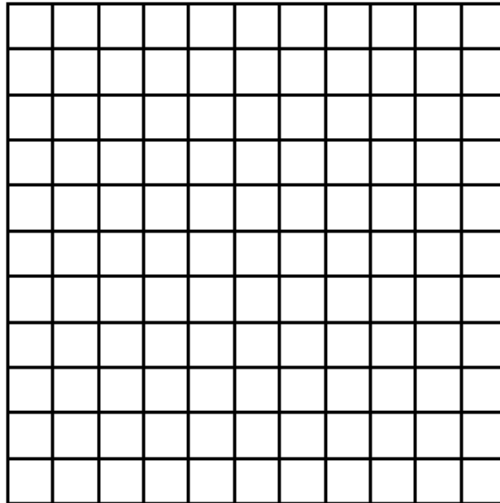
Across

1. Talking pig movie
5. Athletic squad
9. Passion
10. Morocco capital
12. Core of a corps
13. Rub out
14. Of all time
15. Licentious
16. Worn away
18. Means to an __
19. Woodland (Brit.)
21. Ledger expert (abbr.)
24. "Don't move!"
27. Omen
29. Narrate
31. Nixon V.P. __ Agnew
32. Coaxial, for example
33. Drying furnaces
34. Broadcast on TV
35. __ we forget
36. Blueprint

Down

1. Fearless
2. Viper
3. Take on loan
4. Previous to
5. Foot pedal
6. Make, as a wage
7. Lessen
8. Stone worker
9. Unhittable serve
11. Look after
15. Tired
17. Thaw out a fridge
20. An isolated fact
21. Barrel
22. Student
23. Spry
25. Football referee
26. Ms. DeGeneres
28. Coffee dispensers
30. Was ahead (of)
32. Baseball headgear

How long is the first Across word? To find out, subtract 1 from the number of the second Across clue. In our example, the second clue's number is 5, so the first word is four letters long. All we really know in the beginning is that the first answer will appear on the top row of the final grid. In the **middle** of the top row of your graph paper (not at the edges) number the squares 1, 2, 3, etc. up to the length of the first answer word. Put black squares at either end of these numbered squares.

Try to solve the first Across clue and all of the Down clues that cross the first Across word. Every answer will be at least three letters long, so if you can get some of the Down words, you'll be building parts of the second and third rows of your grid.

Next, we'll try to find the word that goes directly under the first word (on the second row). Once in a while the second word is located directly below the first. But when the second word has three or more Down words starting from it, the word won't often be below the first word. See if you can fit it there, but probably the third, fourth, or fifth word will go directly below. Let's try it with our puzzle.

We think that the first word (4 letters) is BABE, and we have a few of the Down words that look reasonable. We'll skip the second Across word for now; it has four Down words, so I don't think it goes below BABE. 9 Across and 9 Down obviously start with the same letter. 9 Down looks like ACE, so 9 Across would be ARDOR. ACE must start below a black square, and ARDOR fits nicely under BABE.

Notice that we can blacken the square above the leftmost black square because you can't have a one-letter word. With the first two letters of 2 Down known, we now guess that 2 Down is ADDER. 12 Across is CADRE, and 14 Across is EVER. Both fit here, so we'll blacken the squares before and after them. 16 Across looks like it could be ERODED and fits with our ERO.... This section of the puzzle now looks like the second illustration above.

Using this same approach on 2 Across, we build Down words and Across words to form another section of the grid. One of the letters in 10 Across (not the first letter) begins a Down word (11 Down). Based on how RABAT matches with TEAM, it looks like 11 Down starts with T. As we start to understand the numbering, we can guess the Down words that we didn't know before. 18 Across (END) appears and suddenly allows us to put the two sections of the grid together.
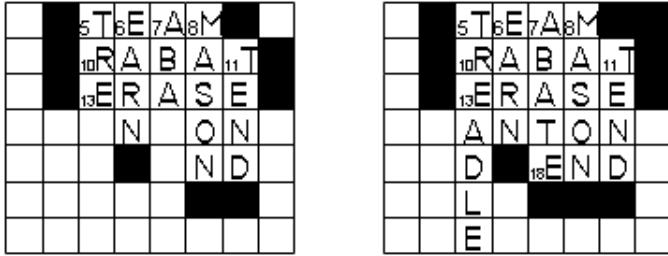
We connect the end of ERODED (16 Across) with the D before END (18 Across). Dropping the columns of black squares on the right and left, we can now enter some of our answers into the 11×11 grid provided for this puzzle. Notice that this puzzle started in column 2 of row 1. These puzzles rarely begin in the upper left corner of the grid. Generally, the pattern of black squares in a diagramless puzzle is not like a normal puzzle.

Every diagramless puzzle will be diagonally symmetric. In other words, the pattern of black squares will be the same whether the grid is viewed right-side-up or up-side-down. If the paper is rotated 180 degrees, the pattern will be the same. But most puzzles <u>do not</u> have mirror symmetry; the pattern won't look the same in the mirror. Because of the symmetry rule, we can now fill in all of the black

squares (and number the white squares). The puzzle is now a normal crossword. Here's a summary of tips for solving diagramless puzzles:

1. The length of the first Across word is the second clue's number - 1.
2. Try to solve this first word and its Down entries.
3. Try to find the Across word that goes below this first word.
4. Use the numbering of clues to determine where words fall.
5. Build sections below other Across words that have many Down entries. Then piece the sections together into the proper-sized grid.
6. Use the rules of symmetry to build the lower part of the grid.
7. When Across and Down words have the same number, they start with the same letter.
8. The last Across word is the same length as the first Across word.

112. Carousel
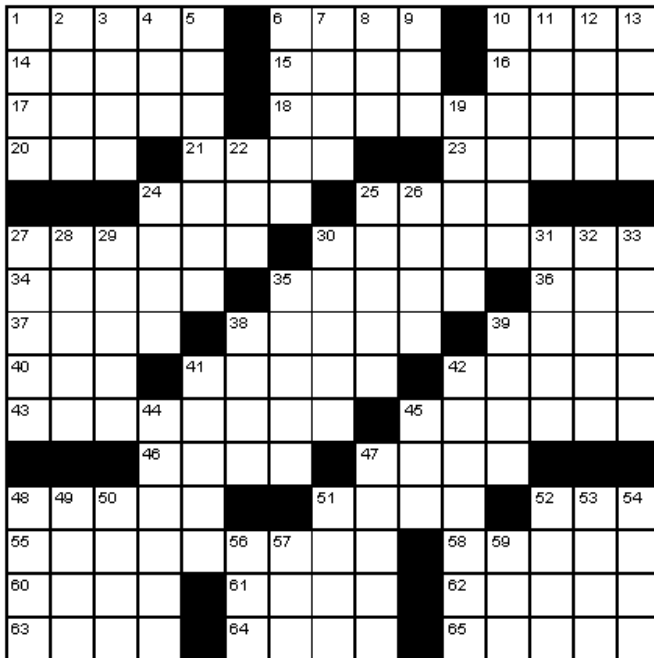
Across

1. Musical Instrument
6. Musical Instrument
10. One and the other
14. Musical Instrument
15. Musical Instrument
16. Buckeye State
17. Prepares for publication
18. Tempo counter
20. Mesh
21. Looked at
23. Concert escort
24. Regrets
25. __ capella (wind ensembles)
27. Horse's leg bone
30. Musical Instruments
34. Chemically inactive
35. __ remark (an insult; 2 wds)
36. Flightless bird
37. Remain
38. Thin, narrow strips

39. Lyre homophone
40. A small violin
41. Name of a musical work
42. Musical Instrument
43. Movements in 3/4 time
45. Foamy sweat, as on a race horse

Down

1. Horse show class
2. Horseback activity
3. Gallop, for one
4. Picnic pest
5. Narrowly win at the track (2 wds)
6. Stables, to horses
7. Still in your bunk
8. Thrush, to horses' hooves
9. Horsepower = 33,000 ft-lb __ min
10. Dwarf tree
11. Exclamation of dread (2 wds)
12. Musical rhythm
13. Cultivator
19. Bizarre

46. Musical signals for vocalist to begin
47. Go up in pitch
48. Resistance measure
51. Famous lexicons (abbr.)
52. Sound of letter six
55. Musical Instrument
58. Horse __; western

22. It is so
24. Lean and sinewy
25. High in pitch; shrill
26. Young men
27. Derby winner Genuine, et al
28. Caper or prank
29. One of the Four Horsemen
30. Spoken exams
31. Whinny
32. A stallion or colt (2 wds)
33. More certain
35. Musical instruments
38. What hands measure on horses
39. Musical instrument

film
60. Horse's forelimb joint
61. Secondhand
62. Lubricated
63. Dispatch, as by Pony Express
64. Musical Instrument
65. Egg-layers lairs

41. Musical Instrument
42. Musical Instrument
44. Reverberated
45. Box cover
47. 15 Across and 42 Down
48. Questions
49. Cause of destruction
50. Beasts of burden
51. Singles
52. Snakelike fish
53. Part of a guitar
54. Crazes
56. Center of a horse cart wheel
57. Augustinian order (abbr.)
59. Pastry item

Cryptic Crosswords

Cryptic crossword puzzle clues point to the answer in two ways: the definition and the wordplay. The **definition** is basically a standard crossword clue. The **wordplay** defines the answer in one of several different methods, like an anagram, a homophone, etc. The overall clue combines the definition and the wordplay into a **surface reading** that often has nothing to do with answer. Here is an example:

Auto Club of U.S. – even parts of Canada

Remember that part of the clue (either at the beginning or the end) is the definition, and the other part is some sort of wordplay. In this case, the definition is at the beginning [Auto Club of U.S.], and the

wordplay is the rest of the clue [even parts of Canada]. The even numbered letters in the word "CANADA" are A, A, and A. The *Auto Club of U.S.* is the A.A.A. (American Automobile Association). The cryptic clue gives you two ways to the same answer.

Let's look at more examples and examine the different types of wordplay that may be involved.

Anagrams

When an **anagram** is used as the wordplay, the clue includes a word or phase to tip off the solver that the letters need to be rearranged. This is called an **indicator**. Consider this example:

> Scrambled Marine pilots (6)

The "6" in parentheses at the end of the clue tells the solver how many letters are in the answer. I left it off of the first example for simplicity, but it is typically included as a courtesy.

"Scrambled" is the indicator. It lets us know that another word or words (in this case, "Marine") can be anagrammed into a word meaning *pilots*. "AIRMEN" is an anagram of "Marine" that means *pilots*. Notice that the definition came at the end of the clue this time.

In the next example multiple words are anagrammed.

> Time has changed disbelief in God (7)

"Time has" is *changed* to form "ATHEISM", which is *disbelief in God*.

Homophones

Homophones are words or phrases that are pronounced alike but are spelled differently (e.g., *through* and *threw*). Consider this example:

> Inform hearing of an award (7)

The definition (*inform*) is at the beginning this time. The phase "hearing of" is the indicator that a homophone is present. *A prize* is an award. To *apprise* means to inform. Once again we have two ways of getting to the answer: APPRISE.

> Rock sounds more daring (7)

In this example the word "sounds" is the indicator that we are using a homophone, but it could refer to "rock" or to "more daring". What two words have these two different definitions but sound alike?

Bolder is *more daring*; *boulder* is a *rock*. Which word is the answer and which is the homophone? We are looking for a seven-letter answer, so BOULDER is the answer.

Notice in this example that the overall clue seems to have a cover sense, or **surface reading**, that is different from the answer. The clue seems to be referring to rock and roll music that is more adventurous. This *surface reading* of the clue is a form of misdirection common in cryptic clues. Many of the best clues have a cover sense that misleads the solver. You'll see more in later examples.

Two Meanings

The simplest form of cryptic clue has two definitions for the same word. In this case it is impossible to tell which definition is the wordplay. These clues are often easy to spot because they may consist of only two words.

> Air filter (6)
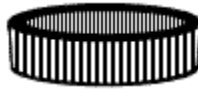
The surface reading might lead you to an auto parts store, but the answer is STRAIN. A musical *air* is a *strain*, and to *strain* a liquid is to *filter* it.

> Misrepresent divinity (5)

A synonym for *misrepresent* is *fudge*. One definition for *divinity* is a type of *fudge*.

> Willing subject (7)

To be *willing* to accept something is to be *content* with it. The *subject* of a report is its *content*. In this example *content* is pronounced differently for each definition, but the spelling is the same.

Charades

A charade is the simple coupling of two or more words to form a larger word. Each of the components is defined (or sometimes stated outright) in the proper sequence. Consider this example:

> Utterly defeat N.E. state land measure (8)

Let's break the clue into three parts: 1) *utterly defeat*, 2) *N.E. state*, and 3) *land measure*. *N.E.* stands for New England in this case. As in regular crossword puzzles, the use of an abbreviation in the clue often indicates that the defined answer is an abbreviation, as well.

Massachusetts is a New England state, and one of its abbreviations is *MASS*. An *ACRE* is a land measure. Put the two words together and it forms MASSACRE, which is a word meaning *utterly defeat*.

Sometimes the components of a charade don't come in the proper sequence. In these cases, the proper sequence may be indicated by descriptive words like *before*, *following*, and *trails*.

> Was in debt after invoice ballooned (8)

Was in debt defines OWED. *Invoice* defines BILL. If you put OWED *after* BILL, you get BILLOWED, which is a word meaning *ballooned*. Notice that the surface reading again misdirects the solver into thinking about financial matters.

Charades can string together more than two words and/or abbreviations. The following example illustrates several complications that can occur in cryptic clues.

> Start to jeer each stinking green-eyed monster (8)

In this case, three components are assembled to form a word meaning *green-eyed monster*. "Start to jeer" must be transformed into the letter "J" (the start of the word *jeer*). *Each* is transformed into its abbreviation (EA). When these two are combined with the word LOUSY (a synonym for *stinking*), it yields the answer (JEALOUSY). Cryptic clues can get even more complicated.

Reversals

A **reversal** is a special case of an anagram. It simply reverses the letters of the wordplay answer to form the defined word. The reversal is indicated by a word or phrase such as *returning*, *back*, *flipped*, or *counter*. Here is a simple example:

> Honor draftsman in return (6)

Honor defines REWARD, which is DRAWER (*draftsman*) in reverse. Here is another reversal:

> Yell, "Up, running back, block!" (6)

Sometimes the puzzle designer puts the actual word or words being reversed into the clue. The answer to the above example is PULLEY. It is defined by *block*, as in "block and tackle". It is "YELL UP" *running back*. Notice that the punctuation and capitalization are misleading. This is common in cryptic clues.

Hidden

A cryptic clue's answer can be hidden in plain sight within the text of the clue like this example:

> And I am on duty guarding gem (7)

The phrase "and I am on duty" is *guarding* a word meaning *gem*. Ignore spaces and punctuation to find the answer (DIAMOND) in "an**d I am on d**uty". The word *guarding* is the indicator that this is a **hidden** clue. Other indicators might be *some*, *part of*, *in*, *housing*, *trim*, etc.

You can also have a **hidden reversal** where the answer is displayed letter-for-letter but in reverse order.

> Some get a gap or pause in return broadcast (9)

Some is the indicator that "get a gap or pause" contains our answer. *In return* is the indicator telling us we need to reverse the sequence of letters. *Broadcast* is a definition for PROPAGATE, which is hidden in reverse order in the clue.

Containers

A **container** is like a charade except that one component in put inside the other component, instead of next to it. Here is an example in its simplest form:

> Manger cradles a leader (7)

Put "A" into MANGER (*manger cradles a*) and get a word meaning *leader*. The answer (MANAGER) is shown in two pieces with instructions as to how to assemble them.

> Equatorial river interrupts current (8)

This clue sounds like an analysis of the Amazon entering the Atlantic Ocean, but not so. "R" (an abbreviation for *river*) is put into (*interrupts*) TOPICAL (a word meaning *current*) to form TROPICAL (defined by *equatorial*).

This illustrates the use of abbreviations in cryptic crosswords. Clues often require solvers to convert words into their abbreviations: *time* becomes "T", *female* becomes "F", *south* becomes "S", etc. Other transformations are less obvious. *Quietly* can lead to "P" because

musical notation uses "p" to stand for *piano*, meaning "play more softly." Roman numerals (*one* for "I", *fifty* for "L", etc.) and atomic symbols ("Au" is *gold*, "W" is *tungsten*, etc.) are frequently used. "O" may be clued by "zero" or even by "love," which is tennis jargon for zero score.

Deletions

Deletions are like the inverse of charades or containers. They provide a word or phrase and then take letters away from it.

> Endlessly talk over field event (6)

Endlessly is the indicator that we must curtail DISCUSS (*talk over*) to form DISCUS (a *field event*).

Here's a deletion that is part of a charade:

> Have lost head - act angry, mean (7)

Lost head is the indicator that the word *have* is beheaded to become AVE. Follow this with RAGE (*act angry*) and get AVERAGE (a definition of *mean*).

& Literal

Occasionally, a cryptic clue isn't separated into two parts – instead, the entire clue is both the definition and the wordplay. It has a wordplay construction **and literal** meaning at the same time.

> Evil at heart of course! (8)

The **exclamation point** at the end of the clue is the indicator that the entire clue is doing double duty. The answer (DEVILISH) is formed by putting EVIL into (*at heart of*) DISH (a word meaning *course*).

This may be a good time to warn you about another punctuation mark that sometimes carries a special meaning. A **question mark** can be used to tell the solver that a pun or coined word is being used instead of the standard meaning of the words in the surface reading.

> Burrowing mammal who issues ID's? (6)

This example has two definitions: a *burrowing mammal* (badger) and someone *who issues ID* badges (badger). Because *badger* isn't typically used to mean someone *who issues ID's*, the question mark tells us to use more creative thinking.

Lettering

The final wordplay category, **lettering**, is really just a special form of charade. We saw a form of it illustrated in the first example about the Auto Club. It usually involves initials like this example:

> Table linen: nearly all people keep it neat initially (6)

The indicator here is the word *initially*. Take the initials of "Nearly All People Keep It Neat" and string them together as NAPKIN, which is a type of *table linen*.

> Starts to sing, only lacking other singers! (5)

Notice that there is an exclamation point to warn us that both the wordplay and the definition use the entire clue. "Starts to" is asking for the initials of "sing, only lacking other singers." These initials spell SOLOS, which is defined by the entire clue.

Cryptic Summary

These various techniques will be thrown at you in bewildering combinations at times.

> Heartless machine ruined the film industry (6)

Heartless implies a deletion of the center letter or letters. Removing the heart of MACHINE leaves MACINE. It is then *ruined* (anagrammed) into CINEMA, which is a synonym for *the film industry*.

Some clues defy classification.

> Happy before I became a flower child (5)

I don't know what category to call this, but it seems to be a valid cryptic clue. What was the word HAPPY before "I" became "A"? The answer is HIPPY, which is a *flower child*.

Watch for indicators in the clues and formats that suggest which clue category is being used. Keep your mind open to different definitions of the same word. Look for hidden words (forwards and backwards) in the clue. Practice anagramming. Once you're hooked on cryptic crossword puzzles, you will never be completely satisfied with regular crosswords again.

Strenuous Training

Try your hand at this themed cryptic crossword puzzle.

113. Happy Holidays (Cryptic)
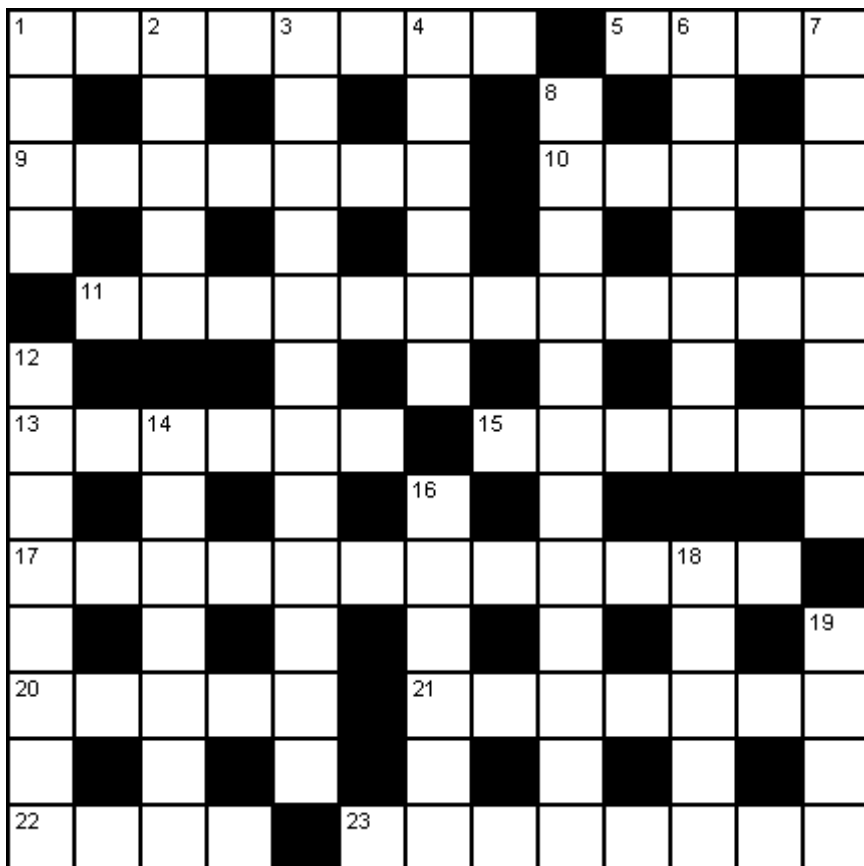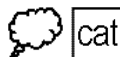
Across

1 Drunken elves taking (hic) sleighs, for example (8)
5 Heavenly sign essential to Christ arrival (4)
9 Amen or a hallelujah surrounding Hanukkah icon (7)
10 Ultimate Christmastime review lets out (5)
11 His gnomes run wild in places for elderly care (7,5)
13 Rolling toys around room like winter weather (6)
15 Require the French part of Christmas tree (6)
17 Xmas 'stuffer' after done stuffing too much stuff (12)
20 Station has an icon of Christmas (5)
21 Nativity scene has a director (7)
22 Kwanzaa initially followed holiday month cards (4)
23 Angry with gift for dad: railroad building block (8)

Down

1 Seductress opening present after 5 AM (4)
2 Heart of Joseph in dutiful religious follower (5)
3 Crazy ads harm city's Yule (9,3)
4 More than ever consuming gas for heating (6)
6 Tried about 2000 decorated Xmas trees (7)
7 Took a nap; wrapping is held off (8)
8 Carol wet and stinking through high school (2,5,5)
12 Took on supernatural power used to embrace endless joy (8)
14 Living in the open sea, distributing cocaine (7)
16 Ex embraced by elf or merrymaker (6)
18 "Silent" follower of yuletide hymn heard damsel's champion (5)
19 Initially the reindeer eat entire evergreen (4)

114. Triviacrostic

Write the answer to each clue, one letter per blank. Then copy each letter to the correspondingly numbered square on the grid. (The letter after the number in each square points to the clue that provides that letter.) The finished grid contains an old TV show introduction. The first letters of the answer words spell a character from the show.

1 T	2 P	3 H	■	4 M	5 C	■	6 U	7 E	8 S	■	9 D	10 B	11 T	12 H
13 Q	■	14 N	15 R	16 U	17 A	■	18 S	19 O	20 B	■	21 U	22 I	23 P	24 J
■	25 Q	26 C	27 N	28 H	■	29 J	30 L	■	31 B	32 H	33 G	34 O	35 P	36 K
■	37 I	38 N	39 E	40 H	41 F	■	42 O	43 D	44 K	■	45 S	46 H	47 K	48 P
49 O	50 F	51 B	52 M	■	53 C	54 N	55 D	56 A	57 R	■	58 Q	59 M	■	60 B
61 E	62 C	63 Q	64 J	■	65 I	66 K	67 R	68 H	■	69 T	70 G	71 B	72 F	■
73 T	74 K	75 C	76 D	77 L	78 A	79 I	80 G	■	81 S	82 M	83 D	84 R	85 E	86 J
■	87 U	■	88 G	■	89 H	90 E	91 M	92 B	■	93 I	94 O	95 A	■	96 L
97 C	98 T	99 N	100 B	■	101 R	■	102 E	■	103 H	104 O	105 Q	106 B	■	107 R
108 N	109 F	110 Q	111 J	112 D	■	113 Q	114 L	115 U	■	116 G	117 C	118 E	119 M	120 D

A. Burns and Allen radio show soap sponsor

__ __ __ __
95 56 78 17

B. First name of woman for whom state of Virginia was named

__ __ __ __ __ __ __ __ __
100 71 10 60 51 31 20 106 92

C. Site of the world's largest naval base

__ __ __ __ __ __ __
75 117 62 5 26 97 53

D. Financially based within the country

__ __ __ __ __ __ __
120 9 112 43 55 83 76

E. Part of a ginger plant where the spice comes from

__ __ __ __ __ __ __
118 7 90 102 61 39 85

F. Hoover and Glen Canyon, for
example

__ __ __ __
72 109 50 41

G. Thorny's (Don Defore's) TV
neighbor

__ __ __ __ __
70 116 88 33 80

H. Passage first navigated by Roald
Amundsen

__ __ __ __ __ __ __ __ __
28 46 32 103 12 89 40 68 3

I. His father's nickname for Ronald
Reagan

__ __ __ __ __
79 22 65 37 93

J. Teen __ (e.g. Davy Jones, Britney
Spears, Donny & Marie)

__ __ __ __ __
29 111 64 24 86

K. Early anesthetic originally called
"sweet oil of vitriol"

__ __ __ __ __
44 36 66 74 47

L. Oodles (of sailors, for example)

__ __ __ __
77 114 96 30

M. GM GPS, communications, and
assistance service

__ __ __ __ __ __
4 52 59 91 82 119

N. __-earth, practical (2 wds.)

__ __ __ __ __ __
99 27 14 54 108 38

O. Amendment forbidding cruel and
unusual punishment

__ __ __ __ __ __
49 94 34 104 42 19

P. Billy Strayhorn jazz standard
"__ Life"

__ __ __ __
23 2 48 35

Q. Two-dimensional insect colony
kept as a toy (2 wds.)

__ __ __ __ __ __ __
105 110 13 113 58 63 25

R. Sani-Flush competitor from
Drackett (now S. C. Johnson)

__ __ __ __ __ __
84 101 57 67 107 15

S. Ohio Art's __ A Sketch

__ __ __ __
8 18 81 45

T. She slapped a cop in Beverly Hills
in 1989

__ __ __ __ __
11 98 69 1 73

U. The last word in fairy tales

__ __ __ __ __
87 21 6 16 115

115. Large Diagramless

a→b 📖
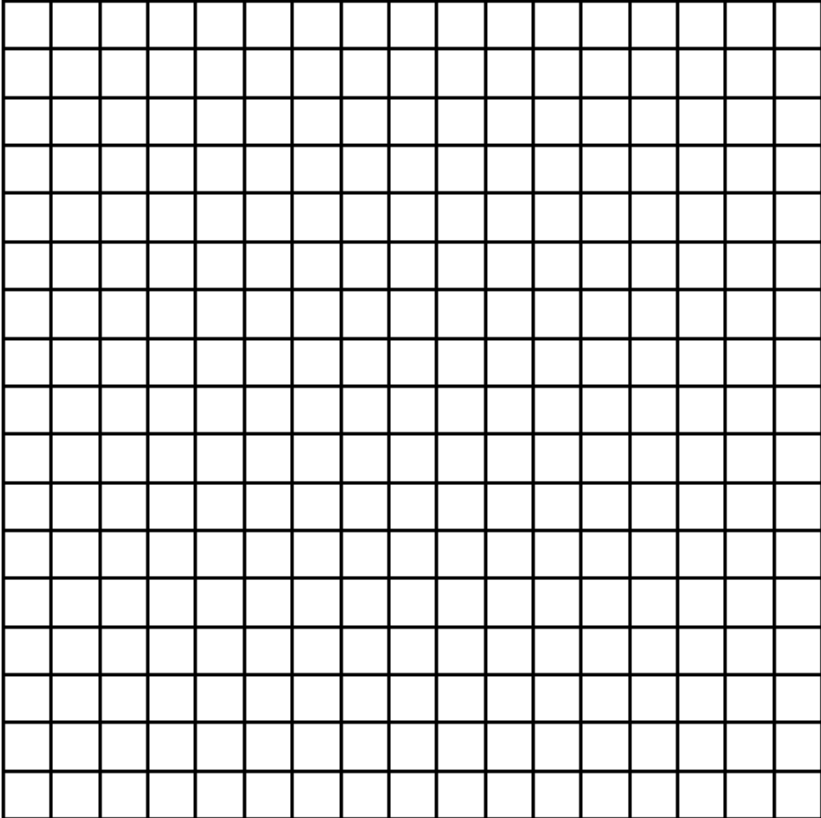
If you want a hint, the answer section will tell you the number of the square where the puzzle starts.

Across

1. West African nation
5. TV network
8. Short-tailed wildcat
12. Revise
14. Govern
16. Mind __ manners
17. Crafters' palm fiber
19. Central point
20. Ancient Peruvian
21. 1000 kilograms
23. See 14 across
25. Sodium hydroxide
27. Consumed
28. Felled tree trunk
29. 'Ead over __ (Cockney in love)
31. PhD (abbr)
33. Left ledger entry
36. Fleet commander
38. Financial professional (abbr)
39. Animal skin
41. Musical shows
44. NYC time zone
47. James Joyce novel
49. Five o'clock __
50. Bond, e.g.
51. Favorite
52. British __, 1811-1820
55. Aromatic herb
57. Idiot
60. Wonka's author
61. __ Fawkes Day
62. Commotion
63. Playing card spot
64. Nimble
67. Mormon leader
70. Pal
72. Close
74. In fact
77. Stereo precursor
78. Donated
79. Sudden flood
80. Clickable symbol
81. Society girl
82. See 45 down

Down

1. Damage
2. Dr. org. (abbr)
3. Departed
4. Data
5. Part of a circle
6. Jefferson's V.P.
7. Evidence in a mystery
8. Prevarication
9. Hither's partner
10. Atomic
11. Irradiated (hyph)
13. TV pioneer __ Shore
15. Deport
18. Opposed to
22. Snakelike fish
24. Obtained
26. Shade tree
30. Maple sweetener (variant)
31. Alamo's Crockett
32. Added to
33. Great tennis serve
34. Health clubs
35. Waistband
37. Depend
39. Amphibian
40. Single
42. View
43. Appear
45. Poi ingredient
46. Paradise
48. Sault __ Marie
50. Slender and graceful
53. Forty winks
54. Golfer __ Rodriguez (hyph)
55. Towboat
56. Hastening
57. Have permission to
58. Scent
59. Dissolute men
61. Street urchin
65. Starring role
66. Roof overhang
68. Back of the neck
69. Joyful
71. Flying saucer
73. Confederate soldier
75. British Inc.
76. Vote for

Challenger Puzzles

WARNING: Very Tough!	RESTRICTED AREA Authorized Personnel Only

116. Carpe Diem
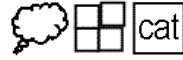
Time to seize the day! It will soon dawn on you that a few of the answers in this puzzle won't fit into the grid. To paraphrase Humpty Dumpty, "Which is to be the master... you or the word?" You must operate on each of these troublesome words as if there were no tomorrow. The resulting entries aren't necessarily valid words. Most of the answers are normal, so enjoy the puzzle. There's no rush. Take a whole week if necessary.
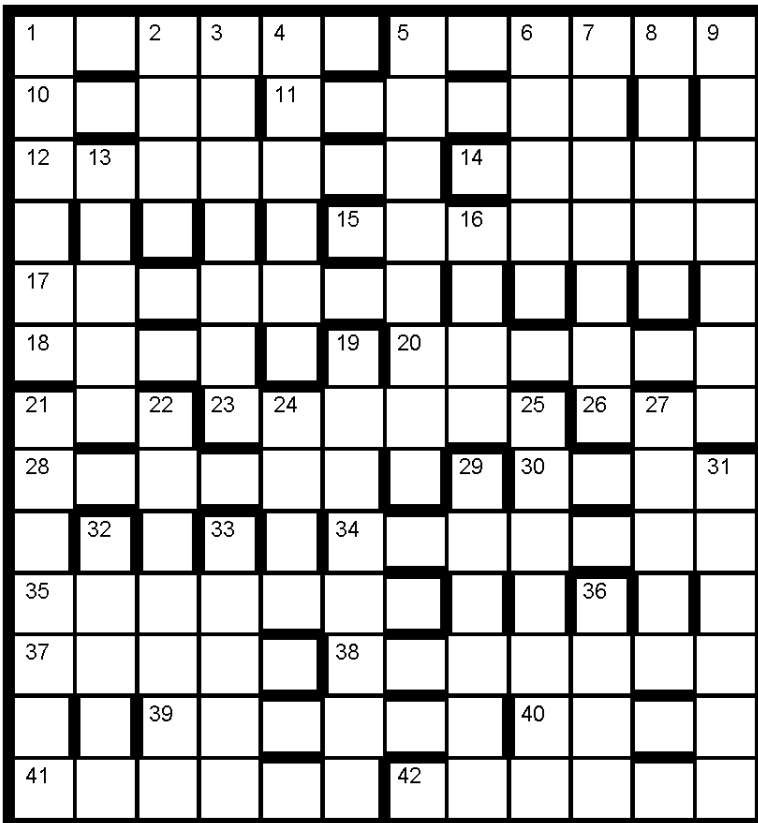
Across
1. Disembodied souls start to suffer hell
5. Amber, for one, transgresses again?
10. I must lie about an inverted wave
11. New York cuts amount at risk, they say

12. So-so ump played with Pogo, for example
14. Electron tube did absorb zero energy
15. Maligner of NATO leaves intolerable mess
17. Father returning, say, tropical fruits
18. Celebrity tells all in review
20. Law involving alien figurine
21. A "Yes" carries voter's agreement
23. Mixed-up Old Sue is equipped with a spirit
26. Immature newt left uncovered
28. Feeling as tension brewed
30. Light brown, as in pie crust
34. Risk taker is more plucky having beginner's luck initially
35. Paronomasia purveyors' pens run wild
37. Hasty after beginning to refuse
38. Old locomotive loses small, hot metal-bearing rock (2 wds)
39. Genuine lady's title and lands
40. Secret gang hides in back lane
41. Shifty clod lays odds with no emotion
42. Place for having fun or hiding in relaxation

Down

1. Blocks housing official's front porches
2. Wildly, Roger succeeds in the morning
3. Expels from pubs after IDs got changed
4. Tests eastern and southern states
5. Negligently, young woman breaks trust
6. More playful messing with fire carries risk
7. Doctor lies to a quarantine
8. Artist models shifting hills of sand
9. Batch contains condiment, milk and juice in ice
13. Gape at your displays of bog fuel
16. I bet horses around champ
19. Avidly men's club follows hurling upset
21. Sterile as Troy in Homeric poem
22. Headless hens ran back from large tangle
24. Faceless spirits leak out slowly
25. Discredits debutante and hunks with nothing upstairs
27. Complimentary Romeo is less inhibited
29. Half-impossible end of excise levy
31. Pressing your gentle heart
32. Was obliged after famous duelist dug tunnel
33. Became passionate, then turned and exploited
36. Sun and moon disturbed wisest man

117. Picture Clues

Here we have a tough crossword that looks easy. Each clue is a rebus of sorts. The answers are typical crossword answers filled one letter per square, but some of the words are proper names or unusual words. A couple of the clues have arrows over the top of a picture; in these cases, reverse the spelling of the pictured word. If you really get desperate, there is a set of cryptic clues and a set of normal clues on the next page.

Across

1. 🫦 t
6. 🥄 Z
11. Y
12. A   E
13. ⬆♠
14.
15. ♂ O
17. n8
18.
19. I
21.
22.   @✓
25. L - D
28. a
29. φ
31. A
33.   r
34. LL z
35.   👂
36. C r z
37.   + NaOH - e

Down

1.
2.   l
3. A'n
4. ψ
5. SLE0
6.
7. HNC
8. no no
9. sp 8
10. y   s

16. ∠ - r + 🔲 - g
20.
21.
22. f U U z
23.
24. Msssspp
25.
26. Fe + C
27.
30. a
32. S

Cryptic Clues

Across

1. Dropped buggy split
6. Criticizes yellow flower
11. Drunks get so turned around
12. Silver gorilla's selfless love
13. One step at a rapid rate
14. In flames, Asia tablelands
15. Wild animal in Philippines
17. When a team arrests "the Great" detective
18. ¾ mile French island
19. I heard reap hooks hang from snowy roofs
21. Old-fashioned models cry "no"
22. In fact, a dancing enthusiast
25. Drug left soprano down
28. Atop some soup once
29. Delaware let English cut out
31. Summer star mixed aspic
33. Jangled nerve at no time
34. Feels ESP holds more than one otherwise
35. Oracle has no curl of a lip
36. Gestapo has ever poetic prophets
37. Playing a lyre too soon

Down

1. Guru swam before me
2. Heard people in fig tree
3. Mindless changing of 9 A
4. Places coil in disarray
5. Author repaired toilets
6. Actress Dawber left map
7. Gag encyclopedia covers bureau
8. In can, a salve of the nose
9. A lot of new tapes
10. Agreements in Hayes estate
16. Burning ID after car crash
20. Burning stick in scene shot
21. Crab disease
22. Female employs igniter cords
23. Some reap plenty of edible fruit
24. No, I see endless racket
25. Discovered clever mechanical advantage
26. Rob mentioned iron alloy
27. Reported milk farm outside of Belfast
30. Neal changed girl's name
32. Fool missed 40% of class

Normal Clues

Across

1. Leaked
6. Milquetoast
11. Skid row sots
12. With mouth wide open
13. Swiftly
14. Flat-topped hills
15. Philippines capital
17. "The Great" detective
18. French for isle
19. Frozen water spears
21. Trite
22. Enthusiast
25. 1960's drug
28. Once __ a time
29. Erase
31. Star in Virgo
33. At no time
34. Following IF-THENs in BASIC
35. Expression of scorn
36. Prophets
37. Premature

Down

1. Hindu teacher
2. Indian fig tree
3. Mindless
4. Centers of activity
5. Nobelist (Lit., 1948)
6. Actress Dawber
7. Administrative division
8. Of the nose
9. Sudden rush
10. Affirmative responses
16. Pungent
20. Fragrance to burn
21. Malignant tumor
22. Igniter cords
23. Edible fruit
24. Sound
25. Mechanical advantage
26. Iron alloy
27. Borough of Belfast
30. Eastern Russian river
32. Fool

Crosswords Bibliography

Crossword puzzles appear in almost every newspaper and magazine you can find. There are also many magazines and books published each year. Here are a few sources I've found especially useful.

Newman, Stanley, and Mark Lasswell. Cruciverbalism, A Crossword Fanatic's Guide to Life in the Grid. New York, Harper, 2006.

Newman, Stanley, and Daniel Stark. The Million Word Crossword Dictionary. New York, Harper, 2006.

Cox, Emily and Henry Rathvon. Random House Guide to Cryptic Crosswords. New York, Times Books, 1995.

Higgs, Barry O. The New York Times Guide to Solving Cryptics, Crosswords, & Anagrams. New York, Quadrangle, 1977.

Simpson, Fraser. 102 Cryptic Crosswords. New York, Sterling, 2008.

Dell Pocket Crossword Puzzles magazine (for more information see www.pennydellpuzzles.com)

Some Noteworthy Web Sites

www3.sympatico.ca/tagies – Theresa Cunningham's great cryptic crosswords

www.puzz.com/crosswordpuzzles.html – Interactive crossword puzzles

www.puzzledepot.com/wordfinder2/crossword.html – A2Z WordFinder: Crossword pattern search utility

www.crossword-compiler.com – crossword making software from Antony Lewis's WordWeb Software

www.doublecrostic.com – Sue Gleason's Double Crostic Puzzle Page (interactive)

www.acrostics.org – Puzzle Baron's interactive acrostic (without the crostic)

www.puzzlecrypt.com – Puzzles with Cryptic Clues by John De Cuevas
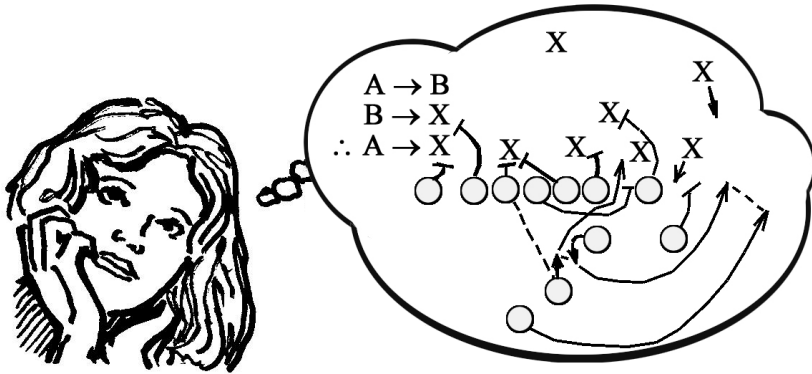
Chapter 7 – Logical and Lateral Thinking

Story

When you think about thinkers, I think you probably think about King Solomon. He is considered by many to be the wisest man who ever lived. Others hesitate to confer this title on anyone with 700 wives. Still – you have to be pretty darn smart to remember that many anniversaries.

One day Solomon was asked to settle a quarrel between two mothers (his wives, perhaps?). One mother (we'll call her Mom A) said that the two mothers lived in the same house and that both had given birth to sons about the same time. Mom A said that the other mother (we'll call her Mom E) had rolled over onto her own baby and killed him. Then Mom E swapped her (deceased) baby for Mom A's (live) baby while Mom A slept. If Mom A was asleep, I'm not sure how she knew this, but no one seems to have asked that question.

Anyhow, Mom A said that Mom E had stolen her son. Mom E denied it. "Did not!" "Did too!" "Did not!" "Did too!" Solomon silenced the two bickering mothers. He was a wise man indeed. He ordered someone to bring him a sword and told the women he would chop the baby in two and give half to each mother. Somehow, my child rearing decisions don't seem so stupid when I see what the wisest man on earth was proposing to do.

"Don't kill my son. Give him to her, but please don't make him into half brothers," Mom A cried. (The baby probably cried, too, but the Bible is silent on that point.) Mom E, in a move that she probably regretted later, said "Go ahead and chop him up."

Solomon realized that Mom A must be the real mother and gave the baby (still in one piece) to her. He charged the other woman with an 802 (stealing another woman's baby without a license). Everyone proclaimed how wise Solomon was. Solomon went on to write many books and songs, but wisely never mentioned this incident in any of them.

Warm-Up Exercises

Puzzle answers begin on

This chapter will consider both logical thinking (Sherlock Holmes style deduction) and lateral thinking (creative, intuitive thinking outside the box). Logic follows strict (left brain) rules; lateral (right brain) thinking lets you create stories and bend the rules.

Logic puzzles have an almost infinite variety of forms. Sudoku (see Chapter 8) and Letter Long Division (see Chapter 5) are essentially logic puzzles. So are cryptograms (Chapter 4) and kriss kross puzzles (Chapter 6). The logic puzzles in this chapter are mixed together with lateral thinking exercises and story-oriented puzzles to avoid left-brain overload.

Most people have seen the liar-and-truth-teller questions. One person always lies; the other person always tells the truth. How can you get a factual answer out of someone when you don't know who is the liar? These puzzles usually involve asking one person what the other person would say. Whether you ask the liar or the truth-teller, you always get a lie. You can then reverse it to learn the truth.

118. What Are the Odds?
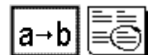
People from Verita always tell the truth, and people from Mendacia always lie. You can't tell them apart by looking at them, and they both speak perfect English without any accent. You come to a crossroads where you meet two men each of whom is either from Verita or Mendacia. They might both be from the same town, or they might both be from different towns.

1. If you ask each of the two men whether he is from Verita, what is the probability that at least one of the two men will say he is from Verita?

2. What is the probability that at least one of the people at the crossroads is not from Verita? Warning: This is tricky.

SOME LOGIC PUZZLES ask you to determine what color hat you are wearing.

Another class of logic problem involves determining what color hat you are wearing without being able to see it. You must base your decision on the actions of other logical people trying to solve the same problem for themselves. Typically, you must ask yourself, "What would the other person do if I had a black hat – or a white hat?" This type of puzzle can be applied to many things other than hats.

Here is a classic logic problem that is actually easier to solve as a lateral thinking puzzle. In the answer, I've included the standard "logical" reasoning and also a faster "outside the box" solution.

119. Spots Before Your Eyes
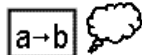
Three excellent, intelligent candidates have applied for a job. The manager can't decide which of these qualified job seekers to choose. He decides to give the job to the person who solves the following problem. The three candidates are shown three black discs and two white discs. The manager will place one of those five discs on the forehead of each candidate. Each candidate will see the other applicants' discs but won't see his own disc. No talking is allowed. The candidate who determines the color of his disc will get the job.

The manager puts a disc on the forehead of each applicant and hides the other two discs. After a little while one of the candidates steps forward and successfully identifies the color of his disc.

How could he determine which color disc he had on his head?

> **Solving Tip #1 – Try a "What-If**." Take a stand and see where it leads. What if this statement is true? What if I take this action?
>
> **Solving Tip #2 – Eliminate things that don't work**. When a "what-if" leads to a "no-way," you can limit your options and pick another "what-if."
>
> **Solving Tip #3 – Develop rules that aid decision making**. Each failed "what-if" can teach us something about the problem. Use your rules to make smart decisions.

There are also many river crossing problems involving cannibals or jealous husbands or hungry animals that must be carefully grouped to prevent disaster. Here's a classic example and a creativity exercise.

120. X-Stream   a→b
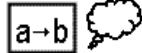
A farmer is traveling with a fox, a duck, and a sack of grain. He comes to a stream with a small row boat on the near bank. The boat is only big enough for the farmer and one of his three objects. He can't leave the duck and the grain alone together because the duck would eat the grain. He can't leave the fox and duck alone together because the fox would eat the duck.

Take the grain first
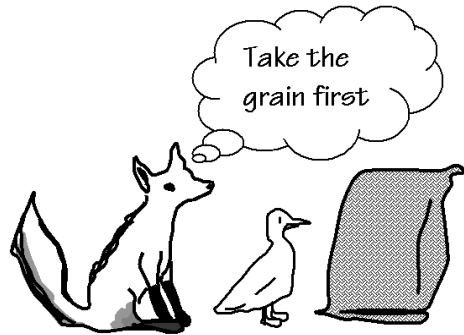
1. How can he transport all three items across the stream in the fewest number of crossings?
2. When you have solved the problem in the usual way, try making it into a lateral thinking puzzle and reduce the number of crossings by thinking more <u>creatively</u>.

River crossings are basically sequential movement puzzles. To try some of the best puzzles anywhere go to Nick Baxter's Sliding Block Puzzle Page (www.johnrausch.com/SlidingBlockPuzzles). But for now, here's another classic example of a sequential movement puzzle.

121. Leap Frog

| 1 | 2 | 3 | 4 | | 5 | 6 | 7 | 8 |
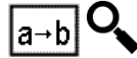
The light-colored (eastbound) frogs only travel east (toward the right edge of the page). The dark-colored (westbound) frogs only travel west (toward the left edge of the page). No frog ever moves backwards. A frog can move forward to an empty lily pad directly in front of it, or a frog can leap over exactly one other frog if there is an empty lily pad on the other side. For example, frog 4 or frog 5 could move to the empty lily pad directly in front of it, or westbound frog 6 could move to the empty lily pad by jumping over frog 5. The goal of the puzzle is to get all westbound frogs west of all the eastbound frogs. In other words, the dark frogs should switch places with the light frogs.

This is surprisingly difficult. At every point only a couple of frogs can move, but, for some reason, I always want to do it wrong. After a few failures, I recognize a basic rule:

> If two frogs are going in the same direction, never move them together when there are frogs in front of them going the other direction.

Obviously, the frogs start out together, but you can't let them *come together* as long as there is "opposing traffic" in front of them. Basically, only frogs 4 and 5 can move at the start. It doesn't matter which one starts, because all of the solutions are symmetrical. Suppose 4 steps forward and 5 jumps 4. If 4 steps forward again, our next move will violate the rule with either two white frogs or two black frogs coming together. So 6 needs to step forward. Here is one solution: 4, 5, 6, 4, 3, 2, 5, 6, 7, 8, 4, 3, 2, 1, 5, 6, 7, 8, 3, 2, 1, 7, 8, 1. Isn't it odd that puzzles always look so easy when the answer is written out like that?

Moderate Workout

Logic on a Grid

Some logic puzzles ask us to sort out an array of data from a smattering of facts. An example should help explain this.

122. The Neighbor Children   a→b ⌘

Four youngsters live in the same neighborhood. They are Agnes, Bonnie, Charles, and Donald. Their four different last names, in no particular order, are Easton, Farmer, Grant, and Harris. From the following clues, determine the first and last name of each child, the child's age, and the type of pet that each child owns.

1. The Harris child is a year older than Bonnie.
2. Charles is allergic to the dog owned by the Farmer teenager next door.
3. Miss Grant is 14 and owns a cat, not the poodle.
4. The youngest child lives across the street from the 12-year-old.
5. The boy who owns the ferret is a year younger than the boxer's owner.

Let's start by constructing a logic puzzle diagram. We know the first and last names from the introduction. The pets are identified in lines 3 and 5. We'll have to work out most of the ages as we go along.

	EASTON	FARMER	GRANT	HARRIS	YOUNGEST		14	TEENAGER	BOXER	CAT	FERRET	POODLE
AGNES												
BONNIE				1								
CHARLES		2	3							3		
DONALD			3							3		
BOXER			3				3					
CAT	3	2	O	3	3	3	O	3				
FERRET		2	3				3					
POODLE			3				3					
YOUNGEST			3	1								
			3									
14	3	3	O	3								
TEENAGER			O	3								

Line 1. Bonnie is not Harris and is not the oldest. Harris is not the youngest. We enter "1" (line number) in each box that we rule out.

Line 2. Charles is not Farmer. Farmer owns a dog (boxer or poodle). Farmer is a teenager. We put "2" in the boxes we eliminate.

Line 3. Grant is a girl (Agnes or Bonnie). Grant owns a cat. Grant is 14. Grant is not Farmer, so Farmer is a different teenager. The diagram above shows what we know so far. We circle the boxes that we know are correct (Grant/cat, Grant/14, cat/14, and Farmer/teen). We put "3" in the boxes that the circles rule out (same row/column).

Line 4. We sort of know ages: youngest, 12, teen (13 or older), 14. Bonnie is a year younger than Harris. Harris isn't Grant or Farmer (the teens) and isn't the youngest, so Harris must be 12. Bonnie must be 11 (one year younger than Harris according to line 1). By elimination on the diagram, we know that Bonnie (age 11) must be Easton. That makes Agnes Grant, Donald Farmer, and Charles Harris. After line 4, our diagram looks like:

	EASTON	FARMER	GRANT	HARRIS	11	12	14	TEENAGER	BOXER	CAT	FERRET	POODLE
AGNES	4	4	●	4	4	4	●	4	4	●	4	4
BONNIE	●	4	4	1	●	4	4	4		4		
CHARLES	4	2	3	●	4	●	4	4		3		
DONALD	4	●	3	4	4	4	4	●		3	4	
BOXER			3					3				
CAT	3	2	●	3	3	3	●	3				
FERRET		2	3					3	4			
POODLE			3					3				
11	●	4	3	1								
12	4	4	3	●								
14	3	3	●	3								
TEENAGER	4	●	3	4								

Line 5. A boy owns the ferret, but Donald Farmer has a dog. So Charles Harris owns the ferret. The boxer's owner is one year older than Charles and must be the Farmer teenager, 13. By a process of elimination, the poodle belongs to Bonnie.

Agnes Grant, 14, owns the cat.
Bonnie Easton, 11, owns the poodle.
Charles Harris, 12, owns the ferret.
Donald Farmer, 13, owns the boxer.

We matched four qualities in this logic puzzle. Some puzzles can have six or more factors on a grid that will barely fit on a page. The facts will sometimes be hidden in the opening paragraph as well as the numbered items. Look for the qualifiers that the designer tries to slip by you. The "Anderson teenager" refers to someone 13 to 19; "Wilson's son" and "he is 18" refer to male children. Look for subtle implications and small details that allow you to infer larger conclusions. Then use the grid to identify cases you can eliminate.

Simplify the problem with a diagram, etc. A baffling puzzle can overwhelm us. Reduce the puzzle to its essentials. If we can represent it both visually and verbally, the puzzle falls under attack from both sides of our brains.

Here are two more logic problems like the ones we saw at the start of the chapter except that these are a bit harder.

123. Jealous Husbands
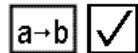
Four married couples are on one bank of a large river. They all wish to get to the opposite bank using a rowboat that can only hold two people at a time. Each husband is extremely jealous. No wife can be in a location with any man unless her husband is also there. Luckily there is an island in the middle of the river. Find a way to get everyone across the river. The only way to get the boat to the island or to the opposite bank is for someone to row it.

If our husbands trusted us, we wouldn't have to row so much.

Try another type of liar/truth-teller puzzle, this one involving signs.

124. Sign Language

Sign 1	Sign 2	Sign 3	Sign 4
At least one of these signs is right.	Exactly one of these signs is wrong.	At least one of these signs is wrong.	Sign 2 is wrong.
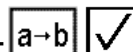
Which of these four signs are right and which are wrong?

Whodunits

Mystery stories generally require logical thinking to figure out who committed a crime and/or how it was done. Full-length novels and short stories often feature mysteries that the reader is challenged to solve along with the characters in the book. The same format can be crafted into a concise puzzle, or mini-mystery. These puzzles sometimes go by a name like "minute mystery" or "whodunit."

You are asked to sort through evidence presented in the puzzle and solve a crime or crime-like situation. These puzzles are usually short (rarely more than two pages). Almost all of them are based on one specific fact that proves the answer. Consider the following example:

125. The Carlton Stern Case
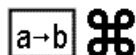
The police had been called when wealthy Carlton Stern was found dead in his home. Homicide detective Carmen Garcia approached the house from the rear, writing some observations on her pad. The glass door to the solarium had been broken from the outside. Shattered glass from the back door was found all over the inside floor, a few potted plants, and a blood-stained pedestal dropped haphazardly just inside the door. Once the glass had been broken, anyone could have entered the home. In the next room Stern lay dead from blunt force trauma.

Stern's body had been found by Consuela Mason (the maid) and Monty Dunham (Stern's nephew) who both entered the room at about the same moment. Stern had been hit twice with a heavy pedestal that had previously supported a small, but valuable, sculpture. The

sculpture is now missing. The murder weapon was the same pedestal Detective Garcia had seen on the floor near the back door.

Mrs. Mason was a delicate woman in her early forties. She was a widow. Her husband had died of cancer six years earlier. She had become Mr. Stern's maid shortly thereafter. She was noticeably shaken by the death of Mr. Stern. She was also concerned about her job now that Mr. Stern was dead.

Monty Dunham had been staying with his uncle for the last few weeks. Since a plane crash claimed the lives of his parents two years earlier, the nephew was Stern's only living relative. Stern had been trying to counsel the 24-year-old about what to do with his life. Stern's will bequeaths a substantial sum to Dunham; the rest goes to various charities and a few other individuals.

Police picked up Kevin Calhoun suspiciously driving in Stern's neighborhood shortly after the crime. Calhoun has a police record of burglaries where he breaks a window, grabs some valuables, and runs. He didn't have the stolen sculpture from the Stern estate when he was taken into custody for questioning. Calhoun had a few art auction brochures and notes in his car.

Who would be your prime suspect and why?

Before I reveal the answer, you may want to consider a few hints for solving mini-mystery puzzles:

1. Never assume that statements made by characters (even police officers) are true. Always assume that statements made by the author are true. Be suspicious when Margaret says, "I was taking a bath when I heard a gun shot." But if the author says that Margaret was taking a bath when she heard a gun shot, accept it as true.
2. Try to determine what could **not** have happened. If there are no footprints in the fresh mud or snow, no one walked there recently. Sherlock Holmes has an old maxim: "Once you eliminate the impossible, whatever remains, no matter how improbable, must be the truth."
3. The criminal's motives rarely play an important role in a whodunit puzzle. Mini-mysteries don't have time to deal with motives; focus on what actually happened.

4. Try to catch someone in a lie. Suspects usually lie to create an alibi or to throw suspicion on others.
5. Look for someone who spills details of the crime that only the perpetrator would know. Ask yourself, "How could he have known that?"
6. Consider timing. The sequence of events is often critical.
7. Some puzzles hinge on "common knowledge" not presented in the puzzle text, such as water freezing below 32º F. Be suspicious when a story includes details that seem a little more specific than necessary.

The murder weapon is a heavy pedestal, probably not something that could be wielded by a "delicate woman" like Mrs. Mason. Although the scene may appear to be a burglary gone awry, a closer examination suggests an inside job. The broken glass was scattered on **top** of the fallen pedestal. If a burglar had broken the glass to gain entry, it would only be **under** the pedestal dropped there after the murder. The nephew had access to the home. He probably broke the glass and hid the sculpture to mislead investigators.

Explain Yourself

There is a class of puzzle that I'll call the "Explain It" puzzle. It presents a seemingly impossible situation that the solver must explain using special case situations. Here is an example:

> Twins were born to the same mother less than an hour apart. In one particular year the younger of the two twins had his birthday on Tuesday, but the older twin had his birthday two days later on Thursday. How can this be?

Here is an answer that accounts for all of the facts in a plausible way. The older twin was born on March 1 aboard a ship. The younger twin (the one born later) was born on February 28, after the ship crossed the International Date Line. But the current year is a leap year, which puts an extra day between February 28 and March 1. You can sometimes develop several reasonable answers for a puzzle of this type.
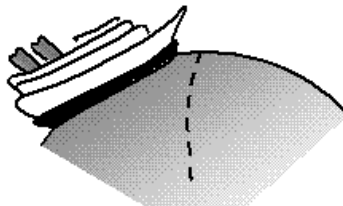
A ***situation puzzle*** (what most people call a ***lateral thinking puzzle***) is a form of "explain it" puzzle. The author presents a situation that doesn't seem to make sense; the solver is asked to create a plausible story explaining the situation. The solver gets very little information and the number of possible answers is usually not unique. A few facts are given, but the solver must fill in the rest of the story. Here is an example:

126. Meadow Murder
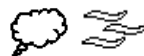
A man in good health dies in a pleasant meadow at least a mile away from any other human, dangerous animal, or machinery. He is murdered without poison, disease, weapon, or explosive. The weather is clear and fair. He is appropriately dressed with boots on his feet and a pack on his back. He clutches a short cord in his hand. How did he die?

There isn't enough information to know anything for sure about how this man died, but you solve the puzzle if you come up with a plausible explanation that matches all the facts. As long as your explanation is reasonable, don't be upset if it doesn't match the "answer." Here is my answer: the man is a skydiver whose parachute (or at least the ripcord) was tampered with.

Most lateral thinking puzzles have far less information and far weirder situations than this example. They are so sketchy that they really require someone who can answer questions if the solvers are going to have half a chance. You not only have to think "outside the box," you don't even get a box!

127. Crash Course

Jeff is traveling very fast. The traffic immediately to his right and left is exactly matching his speed. Suddenly a large bird drops directly into Jeff's path. If Jeff steers right or left, he'll crash into one of the vehicles at his side. The bird is unaware that it is about to be over-taken (and hit at high speed), so it does nothing to avoid the collision. Jeff can't change his speed or stop in time, but he still manages to steer clear of the bird. How does he manage to avoid any collision?

Lateral Thinking

"Lateral thinking" has a broad definition for me. I will use the term to describe any creative, outside-the-box thinking that doesn't follow standard deductive reasoning. It involves imagination and adding details to the problem statement if they seem to be implied by the stated conditions. Thinking laterally creates "what if" situations and looks at things from various perspectives. It also looks for patterns that help make sense of chaos. Lateral thinking would seem to occur mostly in the right hemisphere of the brain.

In essence, a lateral thinking puzzle would allow you to break the rules and add reasonable information that the puzzle left out. This definition would include all situation puzzles as well as creative, outside-the-box approaches to any type of problem.

When you are faced with a lateral thinking puzzle, here are some approaches to consider:

1. Recognize and abandon preconceived ideas. Puzzles often play on stereotypes like fire fighters never being women or 'household residents' always being humans (not pets).
2. Consider alternative meanings for words. Lewis Carroll had a riddle about a boy giving his brother a box, where the box was a punch with his fist. Think of all the definitions for important words in the puzzle.
3. Visualize yourself in the puzzle's situation. Imagine yourself pushing elevator buttons, yachting in the ocean, or startled by someone drawing a gun on you. Let your imagination fill in the details that the puzzle left out.
4. Imagine that the people in the puzzle come from highly unusual backgrounds (circus performers, deep sea divers, arctic explorers, gangsters, French pastry chefs, etc.).
5. Brainstorm with other people about the situation presented. Several brains thinking out loud can create a synergy that breaks out of the rigid, logical limitations we usually impose on ourselves.

Strenuous Training

Do I Recognize a Pattern Here?

A ***pattern recognition*** puzzle is any puzzle that asks you to figure out the sequence of things, to group objects into categories, or to fill in missing pieces. One of the most common types is the next-in-sequence puzzle. You are given a series of symbols (numbers, letters, abstract symbols, etc.) and asked what the next symbol in the sequence would be. Most next-in-sequence puzzles are numeric and involve simple mathematical relationships. Here are a couple of examples:

What would be the next number in each of the following sequences?

$$1 \ 5 \ 4 \ 8 \ 7 \ 11 \ 10$$

$$4 \ 8 \ 5 \ 10 \ 7 \ 14 \ 11$$

In the first example the pattern is established by adding 4 to the first number $(1 + 4 = 5)$ and then subtracting 1 from the next number $(5 - 1 = 4)$. The pattern continues $(4 + 4 = 8$ and $8 - 1 = 7)$. The next number in the sequence would be 14 $(10 + 4)$. In the second example the pattern doubles the first number $(4 \times 2 = 8)$ and then subtracts 3 from the next number $(8 - 3 = 5)$. The next number in the sequence would be 22 (11 doubled). If you came up with different answers that were equally valid, good for you. We can never guarantee that our answer is the only reasonable answer in this type of puzzle.

Here is a classic example (using letters) that works on a different principle:

$$O \ T \ T \ F \ F \ S \ S \ E$$

What is the next letter in the sequence?

This is a good sequence puzzle. It is a sequence everyone knows, but it is foreign enough to be a puzzle. An extra bonus is the way that the letters double up (two T's, two F's, and two S's). These double letters mislead the solver into guessing E as the next letter. The answer we want is N, which stands for nine. The sequence represents the first letters of the numbers 1 (one) through 9 (nine).

Here is another example that is a little nastier:

W I T N L I T

What is the next letter in the sequence?

This one doesn't involve any outside knowledge like the earlier example did. This sequence is built on a special situation that exists within the puzzle itself. Do you recognize the pattern? The question that follows the sequence of letters was used to define the sequence. The first letter of each word in the question is a letter in the sequence. Therefore, "S" is the next letter and the answer to the puzzle.

Another pattern recognition puzzle involves figuring out what certain initials stand for. The puzzles can be unfair when they deal with subjects outside your comfort zone, but they can be fun when they deal with common knowledge. Here are a few examples:

What words do the initials stand for in the following examples?

5280	F in a M
3	M in a Q of a Y
52	C in a D of P C (without J)
99	B of B on the W

The first answer should be fairly obvious to anyone familiar with English measurements. It stands for the number of Feet per Mile. The second answer was intended to be three Months in a Quarter of a Year. Perhaps other answers are possible. The third puzzle is a little harder, but it includes more initials (which is usually more helpful). There are 52 cards in a deck of playing cards, without jokers. The last example is literally "off the wall." It stands for 99 bottles of beer on the wall, lyrics from a well-known song. I think you get the idea.

The last pattern recognition puzzle I will discuss is a ***grouping puzzle***. In this type of puzzle you are asked to group objects from a list or to explain what several things have in common (why they are grouped in a certain way). These can be clever and fun or frustrating and unfair. Sometimes they are both. They are almost always good exercise for your brain. Your right brain does most of the work, and your left brain checks the answers. Here is a typical example of something that might fall into this category:

What unusual characteristic is shared by each of the following words?

<div align="center">

hotshots   intestines   reappear

redder   sees   signings   teammate

</div>

They all have an even number of letters, but that isn't unusual. The first and last are compound words; no help there. Four out of seven end in "s." Two of the words are palindromes (spelled the same forwards and backwards). This observation is actually helpful. We now notice that in each of the words the letters in the first half of the word are repeated (usually in a different order) in the second half. That's it!

There are a few examples of grouping puzzles in this and other chapters. I can't tell you how to solve them except to say that you need to think in different directions until you find a pattern that makes sense. One technique that might help is to write down the thoughts you have that *don't* work. The process of writing out our thoughts seems to give us permission to stop thinking about them. This can free up your mind to pursue different avenues.

128. Word Equations

Make sense of the phrases by determining what each capital letter stands for. A hint is included after each puzzle.

1 W on a U	Notice that "U" doesn't stand for umbrella. If it did, the "a" would be "an."
4 S: S, S, A, and W	The four are listed in the answer. Maybe "A" should be "F."
8 P in our S S (N C P)	Replace "our" with "the" if you prefer. Why only 8? See the parenthetical note.
10 C A in the B of R	This is a United States thing.
13 H in a D of P C	The "H" could have been "C", "D", or "S", but "H" seems easier to me.
30 M in H an H	Notice the "an" in front of "H" and the unusual phrasing ("H an H").
32 B S on a C B	"C" can stand for two different words and still work here.
1969: F M on the M	This is a little different from the others, but it should be easy enough.

129. Grand Opening

You are in charge of arranging a special grand opening for a new store in your town. You'd like to get some radio coverage and maybe a remote broadcast live from your store site. You dig through a stack of cards in your desk drawer and find one that reads:

J JASON, DJ, FM-AM

This looks familiar. What name does the first "J" stand for?

130. Truth or Con Sequences

For each numbered sequence below determine what comes next. In each case I've included a hint that might help if you get stuck.

Example: AEIO
The next letter would be U. These are the vowels in alphabetical order.

1) TWTFS   The next one is actually the first as sequence repeats.
2) IVXLC   The sixth entry is not number 6.
3) ASDFG   Determine the type of sequence.
4) MVEMJS   Most people have never seen the seventh one.
5) WAJMMAJVHTPTFPB   The 16th one. Honest!
6) CAPATGCLVLS   Getting this one would be a sign of brilliance.
7) 8 5 4 9 1 7 6 3 2   It's nothing to do with letters – or is it?

131. Pairs Fashion

Group the following words into five logical pairs:

age   dance   for   ice
rain   sale   sea
spray   tax   use

Then group these words into five logical pairs:

ail   ants   cease   eye
force   prey   reigned
sage   stacks   you

132. Drug Dealer Dead

Detective Jones and his crew were photographing and cataloguing evidence at the crime scene when Lieutenant Smith arrived.

"We haven't touched anything yet. We were waiting for you and the medical examiner," Jones told his boss from Homicide Division.

"A drug deal gone bad?" the Lieutenant asked.

"Could be," Jones answered in his typically noncommittal way.

Smith stepped purposefully around to the far side of the dead body lying face down in a pool of his own blood. He pointed at the victim's left hand still clutching a clear plastic baggie of white powder. Smith said, "The M.E. will check for drugs in his system, but be sure to check this guy's nose and mustache for traces of cocaine before he goes off to the autopsy."

Jones made a note and said, "The neighbors say they heard shots about 9:45, but no one saw anyone entering or leaving the apartment. Of course, that's not surprising. When people around this neighborhood hear shots, everyone heads for cover and doesn't get nosy. There don't seem to be any signs of a struggle or forced entry."

The Medical Examiner arrived and began her grisly work. Detective Jones's crew began bagging and tagging the evidence. Smith took a call on his cell phone and gave some more instructions before heading out the door. "Sweep the place for drugs, weapons, whatever you can find. And get me a copy of the ballistics report on the bullet. Share any info we get with the Narcotics Division," Smith told Jones.

* * *

The next afternoon Smith asked Jones to brief him on the case. Jones said, "The victim's name was Frank Miller. Have you ever heard of him?"

"No, was he a user?" Smith replied.

"We found cocaine in his nose and mustache, and the M.E. says Miller had been using it for months." Jones went on. "Miller was killed by a single gun shot to the chest at short range. Here's the ballistics report, but we haven't found a weapon anywhere in or around the scene. We didn't have to look very hard to find drugs and some cash. There was more coke than a typical user would have,

suggesting that Miller had become a dealer. But if a customer or supplier had shot the guy, you'd expect them to take the drugs and money that we found."

Jones went on to identify three suspected drug suppliers who might have had contact with the victim:

"Andy Anderson is probably off the hook because he was getting a traffic ticket twenty minutes away on the other side of town at the time of the murder. Bobby Baker was drinking and playing darts at Lucky Ed's Tavern according to half a dozen regular patrons. The bar is only two blocks away from Miller's apartment, so I suppose it's possible Baker could have slipped out for a couple of minutes without being noticed. The third suspect is Charlie Carter, who just bought the pawn shop over on Fifth Street."

Jones explained that evidence in Miller's apartment indicated recent contact with Carter and that Carter may have started setting up drug dealers since he moved to town a couple of months earlier.

"Carter says he was home with his wife all night, and she backs him up," Jones continued. "The connection to Carter as a possible supplier has me thinking about a couple of angles. I may have some progress to report in a day or two."

A few days later Jones had cracked the case and made an arrest. Can you follow the clues to his prime suspect?

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133. Single Parent Support Group a→b

A support group for single parents meets every Wednesday. The parents' last names, which are the same as the children's, are Adams, Bush, Carter, Ford, and Tyler. Each parent has only been married once, and none has ever been married to one of the other support group members. There are three women (Betty, Dale, and Pat) and two men (John and Steve). Each parent has one child, each of a different age. There are two girls (Bambi and Sally) and three boys (Fred, Mark and Roger). The children's ages are 12, 13, 14, 16, and 17. Determine the full name of each parent and the first name and age of each of their children.

1. Bush's former spouse is a teacher who has Fred Adams in her class.
2. Mark heard that one of the parents grounded her 14-year-old son.
3. Mr. Carter and the parent of the 17-year-old were introduced to Roger once.
4. Dale Tyler knew Sally's mother until her death last year.
5. Sally is a year older than Dale's child.
6. John's son has piano lessons on Tuesdays.
7. Pat's daughter is not the oldest child.

	ADAMS	BUSH	CARTER	FORD	TYLER	12	13	14	16	17	BARBI	FRED	MARK	ROGER	SALLY
BETTY															
DALE															
JOHN															
PAT															
STEVE															
BARBI															
FRED															
MARK															
ROGER															
SALLY															
12															
13															
14															
16															
17															

Challenger Puzzles

WARNING: Very Tough!	Caution – Proceed at your own risk

134. Fahra Weigh Places

$\boxed{a \rightarrow b}$ ═

Fahra Field is a student at Watson Elementary School in the housing development of Sure-Lock Homes. One day when no one was absent from Fahra's class, everyone got weighed by the school nurse. The total weight of all of the boys in Fahra's class is 698 pounds. The combined weight of all of the girls is 520 pounds. The students are assigned permanent seats in a classroom with several single desks and seven double desks. Circle the letter of the response that best answers each of the following questions.

1. How many classmates does Fahra Field have?

> a. 11   b. 12   c. 13   d. 14   e. 15

2. Which of the following is not true of Fahra's class?

> a. Every girl shares a double desk with a boy.
> b. No two boys share the same double desk.
> c. None of the boys weighs less than the class average.
> d. None of the boys weighs more than 98 pounds.
> e. All boys sit at double desks.

3. Since Fahra was recently ill and weighs 10 pounds less than the average member of her class, how much does Fahra weigh?

> a. 41   b. 62   c. 68   d. 71   e. 82

135. Guess the Number with a Lie   a→b
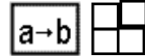
I'll choose an integer from 1 to 16 (inclusive). You ask me seven yes/no questions, and I will answer them all. I am allowed to lie **once** (I'm not required to lie, but I am allowed to). Explain how you can determine the number I am thinking of.

I saw a question like this on the Internet and didn't like the suggested answers because they involved questions about the future. I don't think you should be allowed to ask questions about the future because I won't know if I am lying or not. Such questions are not yes/no questions; they are always "it depends."

Of course, you may arrive at a correct answer that doesn't match mine, but it's also easy to get an answer that doesn't quite work. Be careful, and check to make sure that all circumstances are accounted for before you look at my answer.
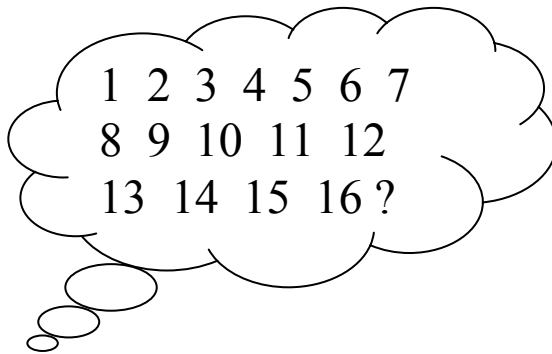
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Bullimore, Tom, Hy Conrad, Derrick Niederman, and Stan Smith. Whodunits, More than 100 Mysteries for You to Solve. New York, Sterling, 2003.

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Harshman, Edward J., Paul Sloane, and Des Machale. Lateral Logician, 300 Mind-Stretching Puzzles. New York, Main Street, 2004.

Summers, George. New Puzzles in Logical Deduction. NewYork, Dover, 1968.

Some Noteworthy Web Sites

www.johnrausch.com/SlidingBlockPuzzles – Nick Baxter's Sliding Block Puzzle Page of interactive classics

www.rinkworks.com/brainfood – Brain Food's (Samuel Stoddard's) collection of logic and situation puzzles

kids.mysterynet.com – You be the sleuth with these children's mysteries
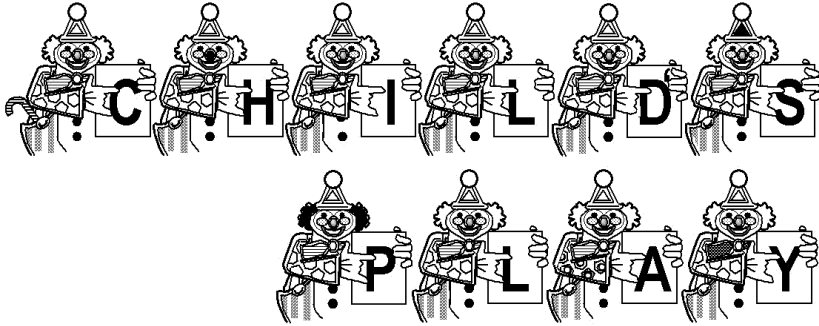
Find the two clowns that are alike. No fair looking at the letters on the cards they hold.

Chapter 8 – Child's Play

Story

For centuries the story of 'Cinderella' has delighted children and adults alike. It has magic! (Like the losing team at the NCAA basketball playoffs, the coach turned into a pumpkin.) It has romance! Cinderella and Prince Charming (a rather presumptuous name, if you ask me) find true love. It has release from bondage! (Well, we're not completely sure about the private lives of royalty living 'happily ever after', but at least Ella doesn't have to scrub floors anymore.)

Analysts of 'Cinderella' say that readers always cheer for the underdog (and the underdog became the coach driver if I remember correctly). What bothers me about the story is how Charming goes about finding his lady love after the ball. Nowadays we would look at the security camera footage and run facial recognition software to track down the elusive beauty. Maybe we'd take a DNA sample from the slipper and run it through the kingdom's database. But the story took place in simpler times.

Prince Charming acts like a ladies' shoe salesman (move over Al Bundy) and slips the slipper on every girl in town. Hmmm. In a way, it's sort of like the chapter title picture. Find the foot that matches the slipper. We can eliminate one girl because she has six toes and another because she has the wrong toenail polish. If the Prince were as smart as he was charming, he'd probably eliminate most girls because they didn't look anything like the girl at the ball.

In the end he manages to find the right girl and verifies that she is the right one when she produces the matching slipper. To his credit, the prince marries Cinderella without a dowry and without a title. Later their story became the basis for several reality TV shows, but glass slippers never really caught on.

Warm-Up Exercises

Puzzle answers
begin on

Children's puzzles tend to have one thing in common: they don't require an in-depth understanding math, vocabulary, science, and other schooling. Puzzles like connect-the-dots or find the differences between two pictures are highly visual and have simple instructions. Even word oriented puzzles, like word searches, don't require an understanding of the words.

I'd categorize children's puzzles into a few basic groupings:
1. Visualization – Connect the dots, paint by numbers
2. Observation – Find hidden objects, identify twins, word search
3. Vocabulary – Word evolution, spot words that start with "S"
4. Reasoning – Sequence puzzles, grouping objects, sudoku

Connect the Dots

As children, most of us were presented with a scramble of numbered dots. The object was to draw straight lines connecting the dots in numerical order. If we did it right, we were rewarded with a line drawing we had done ourselves. It wasn't much of a puzzle compared to the brain-busters covered in most of this book, but it did make a pattern out of chaos. The real challenge was to "see" the picture without actually laying pencil to paper and connecting the dots. In the next puzzle, try to visualize the pictures without actually drawing them.

136. Dots a Double Exposure

Here is one puzzle containing two simple connect-the-dot pictures that overlay each other. Draw straight lines from A to B, B to C, C to D, etc. This will give you one of the two pictures. Then draw straight lines between 1 and 2, 2 and 3, 3 and 4, etc. This will give you the second (overlapping) picture. The hope is that by merging two pictures, you won't be able to guess the final images quite so easily.
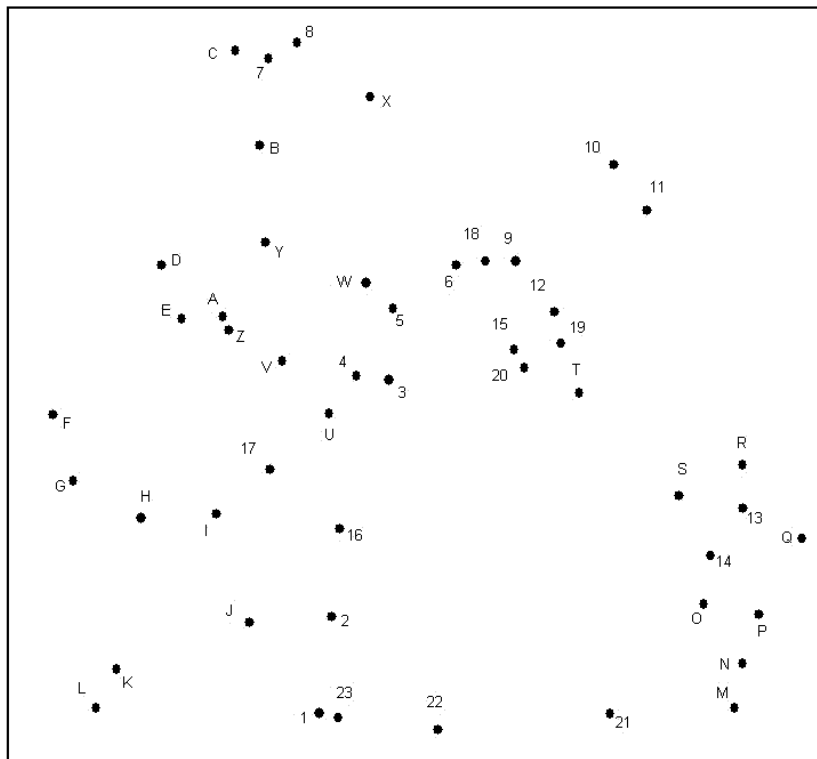
Painting by Numbers

When I was a child, there was a puzzle pastime where you created a picture by coloring in the tiles of a mosaic pattern. You filled in every tile that had a dot (or two) in it; the rest were left white. Some more complicated ones had multiple colors designated by numbers in the tiles. The object was to reveal the picture hidden in the mosaic pattern. I will call these "paint-by-numbers" puzzles.

Like a connect-the-dots, the only "puzzle" in a paint-by-numbers puzzle is to guess what picture will be revealed. The puzzle designer tries to make enough extraneous tiles in the mosaic so that the final picture isn't obvious. The designer also puts the dots or numbers in corners of the tiles so that the solver can't see an overall pattern.

The real value of this type of puzzle is the 'right brain' thinking exercise it gives. Too often this type of visual pattern recognition

begins to atrophy once we leave kindergarten. Professional artists aren't the only people who can benefit from visual thinking exercises.

137. Basic Paint-by-Numbers ⌘ 👁
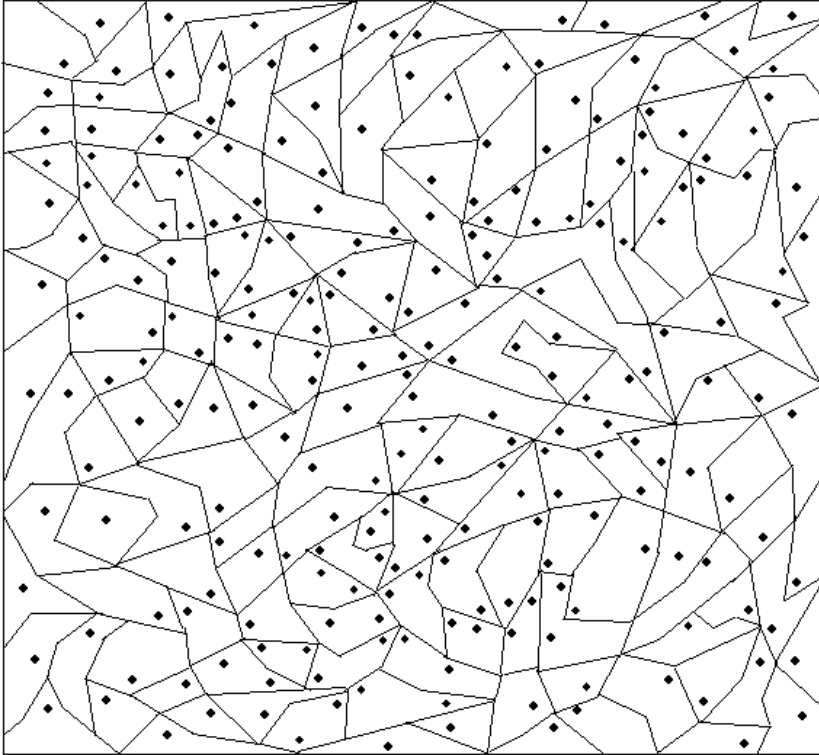
Fill in each area that has **two** dots. Leave the other areas blank.

Some of you will say that the next puzzle is too hard for the Warm-Up section of the chapter. Maybe so, but I thought it should stay with the paint-by-numbers puzzles.

138. Visualize by Numbers ⌘ 👁

If you blacken the areas numbered 1, 2, 3, and 4 in the illustration below, you will see a picture. If you instead blacken the areas numbered 2, 4, 6, and 7, you'll see a different image. And a third picture is revealed if you instead blacken the areas numbered 3, 4, 5,

and 6. Your puzzle is to determine what each of the three pictures looks like without actually coloring in any of the areas. If you feel that you *must* fill in the areas, make photocopies of the puzzle and color those instead. You'll need three different diagrams.
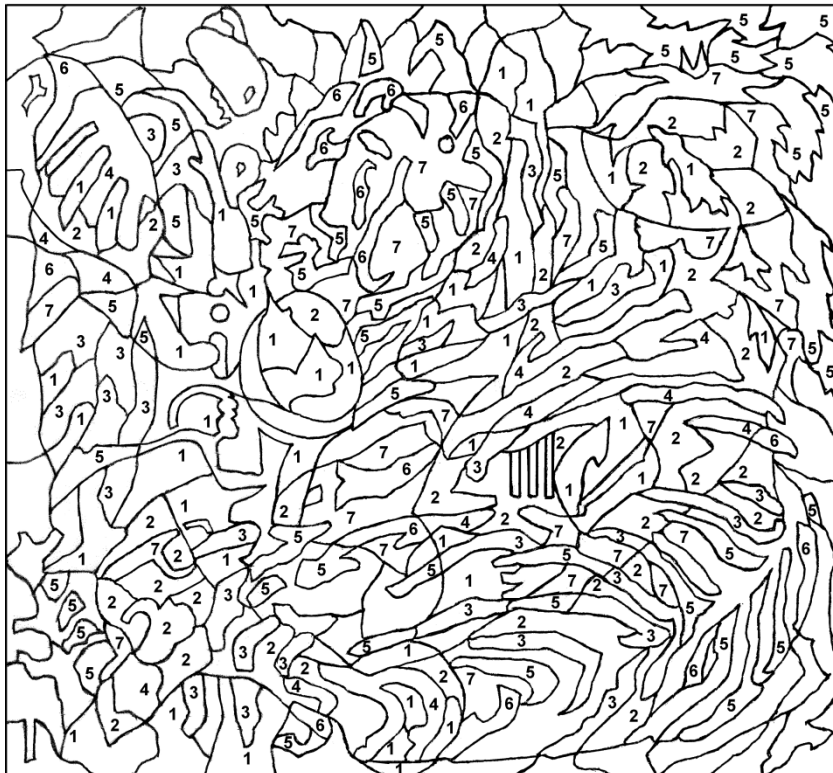
Find Hidden Objects

A hidden object puzzle is a drawing (I'll call it a "cover picture") with several smaller drawings of other objects incorporated into the picture. The hidden objects are always drawn in their entirety but disguised as parts of objects in the cover picture. For example, a hidden fork wouldn't be drawn as a fork on a table, but it could appear as the hair and tail of a mermaid.
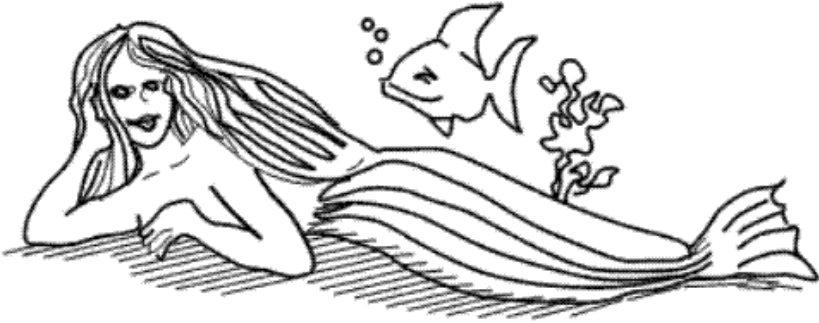
FIND THE FORK hidden in this picture. It's out of proportion compared with the mermaid.

Hidden objects are often rotated at odd angles to fit into the cover picture. The size of a hidden object might have no relation to the size of objects in the cover picture; a hidden yo-yo could be the size of a house, or a house the size of a yo-yo in the drawing. Sometimes the puzzle shows you exactly what the hidden objects look like. When they don't, be sure to keep your mind open to various ways of picturing the same object. A dog, for example, could look like a seated bulldog, a standing poodle, or a running collie.

Look for hidden objects in areas where things appear to be strangely drawn or are very busy and overcrowded. And don't forget to look in the negative space, the space that is not part of an object in the cover picture. Negative space is the space between objects or around objects. A famous optical illusion shows a vase or two faces, depending on what you consider to be negative space. The FedEx logo contains a great use of negative space; there is an arrow pointing to the right hidden between the capital E and the x.
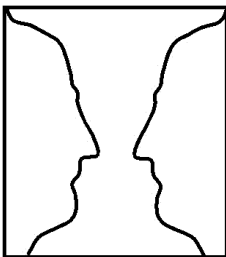
NEGATIVE SPACE (the space between objects) can be used to hide other objects.

One of the best places to find these puzzles is ***Highlights for Children*** magazine. (See www.highlights.com for more information and to subscribe.) There are two ways these puzzles can be presented. The most sporting way (easiest) is to show you exactly what the hidden pictures look like without revealing where they are in the big picture. Even with pictures in front of you, locating them can be harder than you'd expect. The other way is to name the objects using words. This is usually more difficult for the solver.

139. Twice Hidden Objects

Search the picture for hidden drawings. Find all 20 from the list below. Wait a minute! We've hidden the names of the objects in the list, too. For example, the list item "Office Cream Co. next door" contains "ice cream cone" which is one of the hidden objects. Feel free to ignore the spacing, punctuation, and capitalization to find the names. (Picture continues on next page.)

1.   Office Cream Co. next door
2.   Dogs hear sounds
3.   A bellows
4.   Medical kit, empty
5.   High taxes
6.   Help addled brain
7.   Delicate lace
8.   Combination lock
9.   Dappled colors
10. Sacred artwork
11. Assail boa to get away
12. Sing rap, essentially
13. Selfish hooky player
14. Rabbi Tevya
15. Ladybird beetle
16. Taboo M.E. ranger
17. Measure one googol
      ft. eerily
18. Garbage scow boy's
      bootlegging
19. Pauper's hovel
20. Celtic trio has
      sung lasses a song

Moderate Workout

Searching for the Right Word

Word search puzzles have become very popular with both children and adults. You are given a list of words or phrases and asked to locate them in a big matrix of letters. The words can be read across, backwards (right to left), down, up (bottom to top), or in any of the four diagonal directions. The only rule is that you must find all of the letters in the proper sequence with no extraneous letters in between.

Even a very young child can do a word search. You don't even have to know how to read the words as long as you recognize the pattern of

the letters. That makes it a good pastime for children who need to sit still and stay quiet. And I suppose it makes a good pastime for adults who have to sit still and stay quiet, as well.

```
                        M H T Y H R I B L E
   ┌──────────┐         U I L I A C U E R Z
   │  Rhythm  │         E A G D C L N T I N          ┌──────────┐
   └──────────┘         S T O N G I L A N O          │  Align   │
                        U U T E O A L A R R          └──────────┘
   ┌──────────┐         M S A R O N G L O B          ┌──────────┐
   │  Hiatus  │         A T R A N S O N I C          │ Illicit  │
   └──────────┘                                      └──────────┘
```
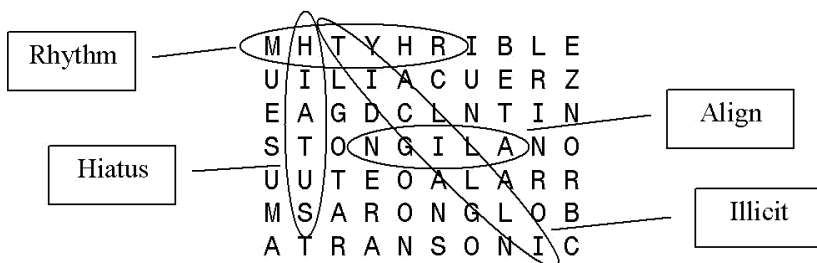
WORD SEARCH PUZZLES often have words with strange letter patterns that seem to be spelled wrong.

Consider these tips for solving word search puzzles:

1. If a word list is provided (and it usually is), familiarize yourself with each word in the list before you start searching. This increases the odds of recognizing a word as you go to work.
2. Scan through the grid and get the obvious words first.
3. Use a highlighter pen to cross off the words on the grid and check off the items on the word list. If the ink leaks through the paper too much, draw a light pencil line through the words. What you are trying to do is to visually recognize what areas of the grid have been used at least once without obliterating the letters.
4. Look for entries with rare letters. Find the letter in the grid and try all directions to see if it is part of the entry you are looking for.
5. Look for long (oversized) entries; these usually have a limited number of places they can hide.
6. Search for the remaining items in the areas of the grid that have the least highlighting.
7. If there are still some missing items, begin a methodical search of all eight directions (or just give up and go to the next puzzle).

General Puzzle Principle **I** **Have fun.** Puzzles are games; they are supposed to be fun. Don't let a puzzle frustrate or depress you. Play with it. Don't take it too seriously. If it's too hard, look up the answer. If you don't like the answer, pencil a warning into the margin so you won't try it again.

140. Catching Some Z's ⌘ cat
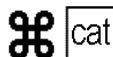
Here is a simple little word search puzzle, but I've added a nasty complication: words can wrap around from one edge to another – as if the puzzle were printed on a ball. For example, notice that the word PUZZLE can be read as the second row's last four letters and first two letters. In a rare moment of mercy, I have refrained from using this wrap-around technique with diagonal entries.

```
R E Z E E B U Q A E
L E U L U Z P U Z Z
Z O B A F R I A A O
T U J Z R I M R B O
U Z K A I A Z T P N
L C R A Z E E Z I S
K Q U I Z Z E S Y A
O Z N Z D O Y O R R
O G Z A K O O Z A B
```

Word List:

ADZE	AMAZING	AZALEA	BAZAAR	BAZOOKA
BEEZER	BOOZE	BOZO	BUZZ	CRAZE
FIZZY	FRIZZ	JAZZY	KAZOO	KLUTZ
MAZE	PRIZE	PUZZLE	QUARTZ	QUIZZES
SIZE	SNOOZE	ZEBRA	ZORRO	ZULU

What's the Difference?
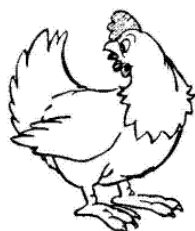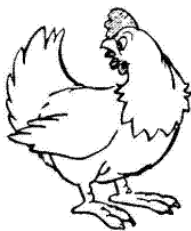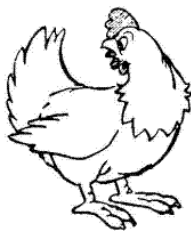
ACEE   GRACIE   STACY   TRACEY

FIND THE TWINS – Which two chickens are the same? Which two chickens are slightly different?

An observation puzzle involves finding differences between pictures. At first glance, two or more pictures appear to be identical, but you begin to find differences on closer examination. This puzzle has two basic types: 1) identify the differences, and 2) find the "twins." In

both cases you are really looking for what is different from one picture to another. These are purely exercises in observation.

I must admit that I find these puzzles fun. I particularly like to find the two pictures out of several that are the exact matches. Consider the simple example on the previous page. There are four chickens. They are all looking backwards (probably wondering why they crossed the road). Which two are the same?

The differences are often hidden in the spacing between two lines, in the absence of a particular object, or in numbers of repeated elements. In this case, count the tail feathers and the toes of each hen to identify that Gracie and Stacy are the twins.

With the rise of photo retouch software, spot-the-differences puzzles are often two photographs with slight differences. The solver must identify several devious changes. There are entire books of these puzzles to build your observation skills and prepare you for a career in crime scene investigation.

141. What Has Changed?

Find at least 9 differences between the two drawings shown below.
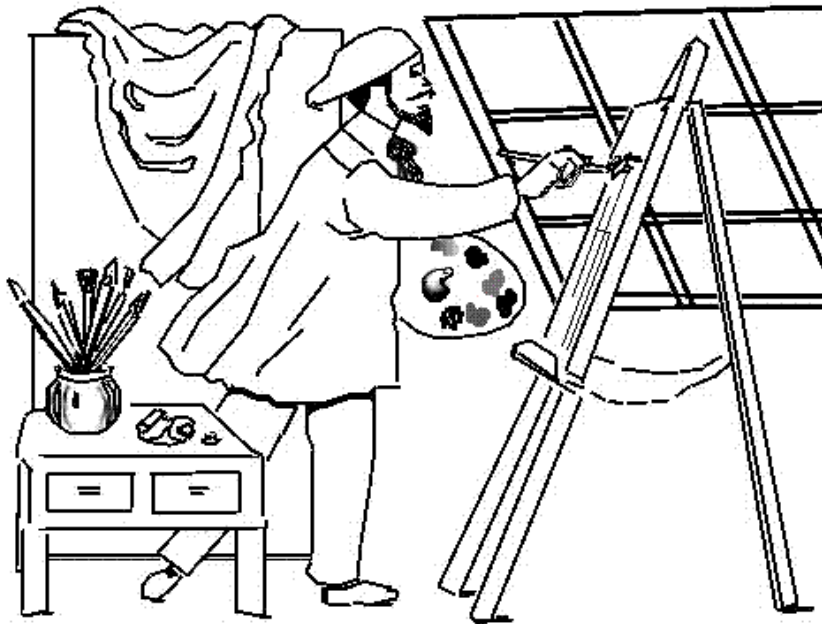
Fill Me In

Another type of puzzle relies on vocabulary and spelling. In a fill-in puzzle, the solver is presented with a skeleton crisscross of squares. Some of the squares are already filled in; others are left blank. The object is to fill in the blank squares with letters to form valid words in the Across and Down directions. Of course, the designer deliberately picks words that are ambiguous and hard to recognize.

A FILL-IN PUZZLE asks you to supply the missing letters to form words.

Tips for solving fill-in puzzles:

1. Use words that are appropriate to the audience (e.g., a children's puzzle wouldn't use a word like OROTUND).
2. Make a quick scan of the entire puzzle and start with the unambiguous answers.
3. Then work on the words with the fewest choices.
4. Always consider the cross words before accepting a word, even tentatively.
5. Avoid simple plurals or verb forms ending in "S" (e.g., GOOFY is more likely than GOOFS).
6. Avoid risqué words (e.g., FACT and FAST are more likely than any other word).
7. Avoid situations where multiple words are possible and can't be resolved with cross words.

The answer to the sample puzzle is Across: Guess, ego, fact, any; Down: Zebra, goofy, epic, sum.

142. Mystery of the Lost Letters ⌘ 📖

Fill each blank square with a letter to form valid words whenever two or more squares form a line across or down. No proper names, capitalized words, or foreign words are allowed. You will need more than the typical child's vocabulary to solve this mystery.

L	E		■	M	O	R	E		■
■		D	■	U	■	■		O	■
■	S			T	E		■	R	■	T
B			■		■	E			E	
	■	L		N	■	N	■	E	■	
U	■	■	■		R		S	T	■	V
N	■		■	■		■		■		E
	E	B	R	I		■	L	I	L	
■		B	■		P	■	F	■	
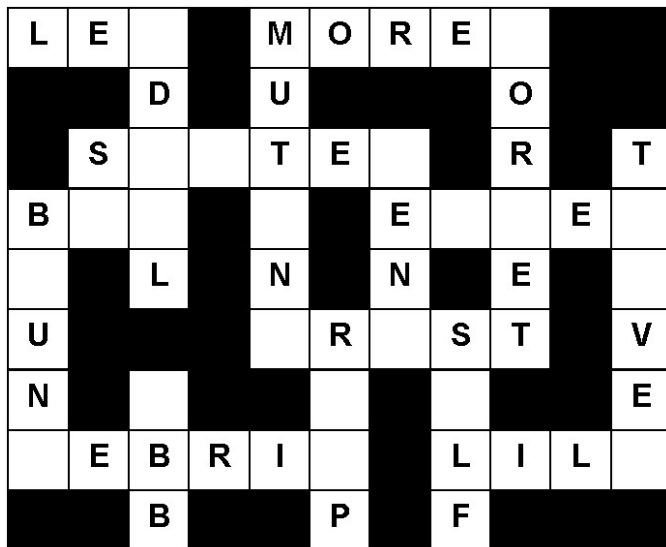
Strenuous Training

Sudoku

In the early years of this century, the world seems to have gone crazy for *sudoku*. I admit that I enjoy these puzzles, too. In case you haven't seen a sudoku puzzle, here is a brief explanation: A 9×9 grid of squares (nine rows of nine columns) is subdivided into nine 3×3 blocks. The object of the game is to fill the grid with numbers so that every row, column, and 3×3 block has exactly one of the digits 1 through 9. Each puzzle starts with some numbers already filled in. Solvers use logic to complete the grid.

Here are three basic methods I use to solve sudoku puzzles:
1. Pick a digit and try to figure out where it goes in each block.
2. Pick a block, row, or column and try to figure out how the nine digits fit in.
3. Pick a square and try to figure out which digit goes there.

5		2		8			4	1
8					5		6	9
			4	7	8			
4		1	5					
	6		4		3		5	
				6	9			4
		6	3	5				
1	4		9					2
9	8			2		6		3

Let's solve the example puzzle above. I notice that there are a lot of 6's already filled in, so let's see if we can fill in the other 6's.

Method 1. Pick a digit and try to place it in grid.

Mentally cross off rows, columns, and blocks that already have 6's in them. Any block, row, or column that has only one open square can be filled with a 6. In this puzzle, we can fill in all of the 6's using this technique. Sometimes this method leads to quick answers.

5	X	2	◯	8	X	X	4	1
8	X	X	X	X	5	X	◇6	9
◯	X	X		4	7	8	X	X
4	X	1	5	X	X	X	X	◯
X	◇6	X	4	X	3	X	5	X
X	X	X	X	X	◇6	9	X	4
X	X	◇6	3	5	X	X	X	X
1	4	X	9	◯	X	X	X	2
9	8	X	X	2	X	◇6	X	3

MENTALLY PUT AN X in each box that can't be a 6.

Try the same technique with 4's. Again, you can finish off the 4's. 8's take a little more work. There are only three empty squares in the bottom center block. There is already an 8 in the bottom row, so the square on the bottom row can't be an 8. Therefore, one of the squares in the sixth column must be an 8. We have narrowed it down to two squares, but, more importantly, we can mentally eliminate this column when we look at the block above this one. We can put an 8 in the lower left square of that center block. Almost miraculously, we can continue this approach and fill in all of the 8's (left grid below).

5		2	6	8			4	1
8		4			5		6	9
6				4	7	8		
4		1	5				8	6
	6	8	4		3		5	
			8		6	9		4
		6	3	5		4		8
1	4		9	6	8			2
9	8			2	4	6		3

5	3	2	6	8	9		4	1
8		4		3	5		6	9
6		9		4	7	8	3	
4	9	1	5			3	8	6
	6	8	4	9	3		5	
3			8		6	9		4
	6	3	5		4	9	8
1	4	3	9	6	8			2
9	8			2	4	6		3

We use the same technique to fill in the 9's and then the 3's. The grid on the right is the result. We might be able to continue this technique, but let's look at another method.

Method 2. Pick a block, row, or column and fit the nine digits into it.

The top row has only one open square; it must be 7. The second row has three open squares, but only the one on the left can be a 7; the other two blocks already have 7's. The upper left block now has one open square; it must be 1. Next, we'll try the third method.

Left grid (with 7 circled in R1C7, and 7, 1 circled in the left column of the second and third rows):

5	3	2	6	8	9	(7)	4	1
8	(7)	4		3	5		6	9
6	(1)	9		4	7	8	3	
4	9	1	5			3	8	6
	6	8	4	9	3		5	
3			8		6	9		4
		6	3	5		4	9	8
1	4	3	9	6	8			2
9	8			2	4	6		3

Right grid (with 5 circled in R3C9, 7 circled in R5C9, and 5, 7 circled in R8C7–8):

5	3	2	6	8	9	7	4	1
8	7	4		3	5		6	9
6	1	9		4	7	8	3	(5)
4	9	1	5			3	8	6
	6	8	4	9	3		5	(7)
3			8		6	9		4
		6	3	5		4	9	8
1	4	3	9	6	8	(5)	(7)	2
9	8			2	4	6		3

Method 3. Pick a square and try to fill in a digit.

Pick a promising square: the square in the middle of the right column. There are only two numbers missing from that column (5 and 7). This square must be 7, because there is already a 5 in that middle block.

Completed grid:

5	3	2	6	8	9	7	4	1
8	7	4	1	3	5	2	6	9
6	1	9	2	4	7	8	3	5
4	9	1	5	7	2	3	8	6
2	6	8	4	9	3	1	5	7
3	5	7	8	1	6	9	2	4
7	2	6	3	5	1	4	9	8
1	4	3	9	6	8	5	7	2
9	8	5	7	2	4	6	1	3

Pick another square: the center square in the lower right block. There are only two numbers missing from that row (5 and 7). This square must be 7, because there is already a 5 in that column. Using method 2, we can also complete the column and row in these two examples. Now we can use all three methods (whichever is easiest in each case) to complete the puzzle.

You'll have to refine these techniques for tougher sudoku puzzles. For example, when applying method 1, you might only be able to limit a number to one of two squares within a block. This may lead to eliminating a row or column in other blocks. If you know that two squares within a block are each either 7 or 8, you may be able to apply method 2 without knowing which is the 7 and which is the 8.

143. Won through Nine   a→b

Here's your chance to try a really tough sudoku puzzle.

4		2						7
		1	9		3			
				8				6
8		9	3					
			4	5	8			
					2	6		3
3				7				
		5			9	4		
2						1		5

Word Evolution

A **word evolution** puzzle gives you a starting word and an ending word; your job is to mutate the starting word, one letter at a time, to form the ending word. Each time you change a letter, you must form a new word. Here's an example:

CALM to WILD (3)

The number in parentheses indicates the number of new words you will form along the way. Here are a few hints for solving these puzzles:

1. Work from both directions. In the example puzzle you could change CALM to BALM, PALM, CALF, and CALL; you can also change WILD to GILD, MILD, WELD, WIND, WILE, WILL, WILT, and WILY. Working from both directions lets you look for common letters that bring the sides closer together.
2. Consider changing each letter in the word. Notice that WILD could have each of its four letters changed to form a new word.
3. Pay close attention to the number of new words. It will tell you if you must go straight to a letter in the target word or whether you have some "slack" (you can change to a letter that isn't in the target word). In our example, you must change three letters to go from CALM to WILD. With three intermediate words, you are allowed to change four letters; so you can change one letter to anything you like as long as that letter isn't the common letter, L.
4. Start from the direction that has fewer choices: in this case, CALM. There is no direct way to get to WILD, so you will have to change to a letter that isn't in WILD. CALL is the obvious choice to get to WILD via WALL and WILL.

Therefore, an answer to this puzzle is **CALM** – CALL – WALL – WILL – **WILD**. Often there are multiple solutions to this type of puzzle. Give yourself extra credit if you find more than one way to make the transformation.

When you get to more challenging word evolution puzzles, you will find it valuable to consider patterns of vowels and consonants. For example, changing BID to ASK requires you to move the vowel from position two to position one. This means that at least one of the intermediate words will have two vowels. An answer to this puzzle would be: **BID** – AID – AIM – ARM – ARK – **ASK**.

144. Make a Wish Become True

Change one letter in the first word to form a new word. Then continue forming words by changing one letter in each new word until you form the target word. The number in parentheses indicates the maximum number of intermediate words you are allowed to form before getting to the target word. For example, CUP to TEA (3) = **CUP** – PUP – PEP – PEA – **TEA**. Give yourself bonus points if you can evolve to the target word with fewer intermediate words.

TRY to WIN (3)
KISS to HUGS (3)
EWE to RAM (4)
ROCK to ROLL (4)
SLIP to FALL (4)
PIES to CAKE (4)
FOOL to WISE (5)
THINK to BRAIN (6)
OLD to NEW (7)
WISH TO TRUE (7)
FROWN TO SMILE (8)

A-letter-ation

One of the more challenging puzzles for kids asks them to look at a picture and find all of the objects that start with a certain letter. For example, find 20 things that start with the letter M. The child's vocabulary is put to the test. Right and left brain functions come into play. Children must observe, identify, name, spell, and categorize objects pictured until they tally enough words to meet or beat the number set in the puzzle.

As discussed in the rebus chapter, you begin by identifying the picture. This time, however, you have the freedom to pick synonyms that start with the right letter. If you are really a fan of this kind of puzzle, you'll have a thesaurus and a dictionary open to the appropriate letter.

Grouping/Categories

Puzzles can ask you to group a set of pictures or words into like categories. These puzzles are discussed in Chapter 7, but children's puzzle books often have a few of these. Kids are usually expected to do something like grouping plants into one group and animals into another. By now you should know that this book wouldn't be that easy. Get ready for a tough grouping puzzle in the challenger section.

Challenger Puzzles

WARNING: Very Tough!	Choking hazard for children 103 and younger

145. Group Therapy

Categorize each of the fifteen pictures into one of five groups. Each group will have exactly three pictures with something in common. Each picture will be in only one group.

146. "S" Is for Starters

For starters, search the following 2-page illustration and find 20 things that start with the letter "S." Once you've finished that warm
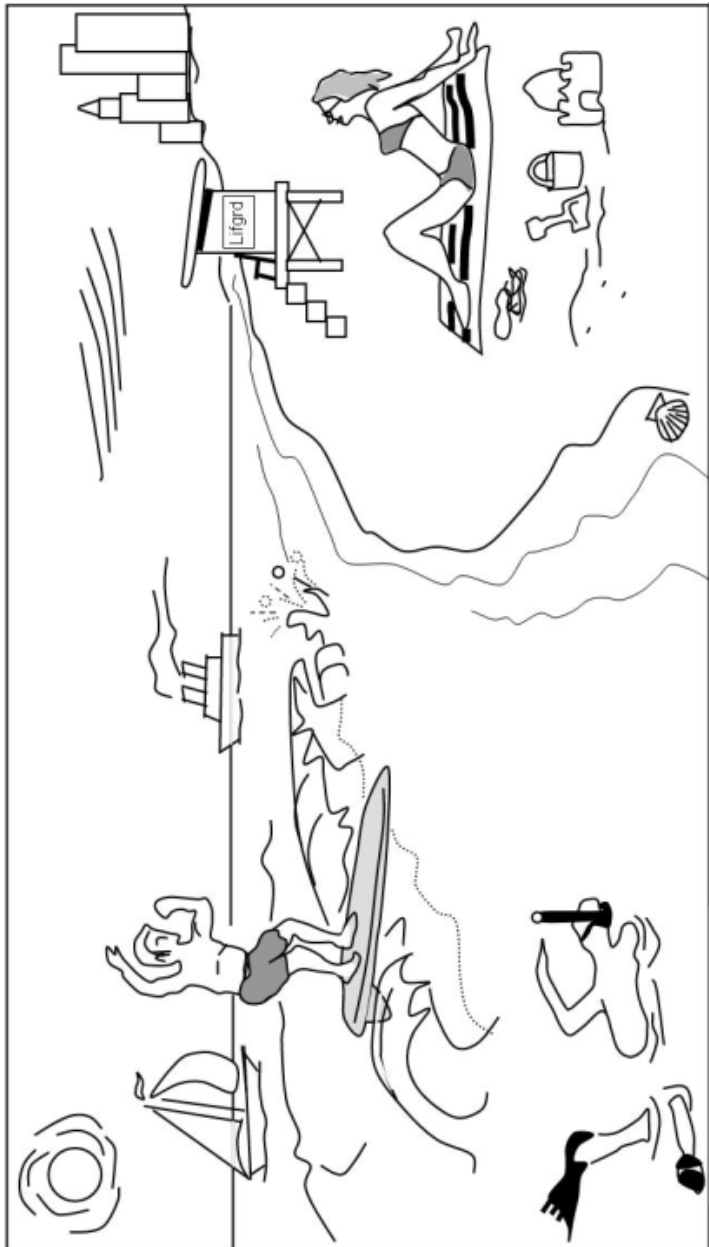
up, double it and find 40 <u>more</u> things that start with the letter "S." When you've found 60, go back and find 60 more. Then you can try to top our list of over 150 things that start with the letter "S."

AUGUST

SUNDAY	MONDAY			THURSDAY	FRIDAY	SATURDAY
1	2	3			6	7 Buy a SOFA?
8	9	10			13 Surgery	14 sō´fə
15	16	17			0	21
22 "Say it with flowers"	23	24				28
29	30 75% chance of sleet/snow @#⊗/✳!	31				

To the greatest ... & dad
Sam Steph Suzie

$$2^2 - 1 = 3$$

$$+60 \over 63$$

$$+7 \over 70$$

$$\Sigma$$

SEPTEMBER
1 2 3
5 6 7 8 9 10
12 13 14 15 16 17
19 20 21 22 23 24
26 27 28 29 30

JULY
1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31

Child's Play Bibliography

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Dedopulos, Tim. <u>The Photo Puzzle Challenge</u>. London, Carlton Publishing Group, 2008.

Fox, Robin. <u>Photo Tricks: 100 Spot-the-Difference Challenges</u>. New York, Sterling Innovation, 2009.

Kalvitis, David. <u>Greatest Dot-to-Dot Super Challenge!</u> (Books 5, 6, and 7). Rochester, NY, Monkeying Around, 2007-8.

Tallarico, Tony J. <u>Spot-the-Differences Across the USA</u>. New York, Dover, 2008.

<u>Hidden Pictures Playground</u>, a series of "books" (magazines) published by Highlights (see www.highlights.com)

Some Noteworthy Web Sites

www.websudoku.com – Gideon Greenspan and Rachel Lee's free interactive sudoku game site

www.conceptispuzzles.com – terrific source for innovative puzzles

www.wuzzlesandpuzzles.com – Teachers' puzzle site including word evolution, mazes, mad gabs, and more

www.enchantedlearning.com/wordladder – Enchanted Learning's word evolution (word ladder) puzzles

thinks.com/puzzles/doublets.htm – Hillclimb Media's word evolution (doublets) puzzles

thinks.com – Hillclimb Media's puzzle and game site

www.highlights.com – ***Highlights for Children*** magazine, a great source for hidden object puzzles

www.highlights.com/puzzlemania-home – ***Puzzlemania*** magazine of puzzles for kids 7 and up

Answers ⁻ Answers ⁻ Answers ⁻ Answers

Don't be afraid to look up an answer. Our goal is to improve our minds. Doing research allows us to learn something new. Our brains develop as we learn, and the new facts provide more building blocks for our creativity to play with.

Chapter 1 – Mazes

1. ...Whose Fleas Were White As Snow - Answer

The answer is explained in the chapter text.

2. An Arrow Escape - Answer

Here is what the maze looks like without the arrowheads. Without the distractions, we can quickly negotiate the maze.
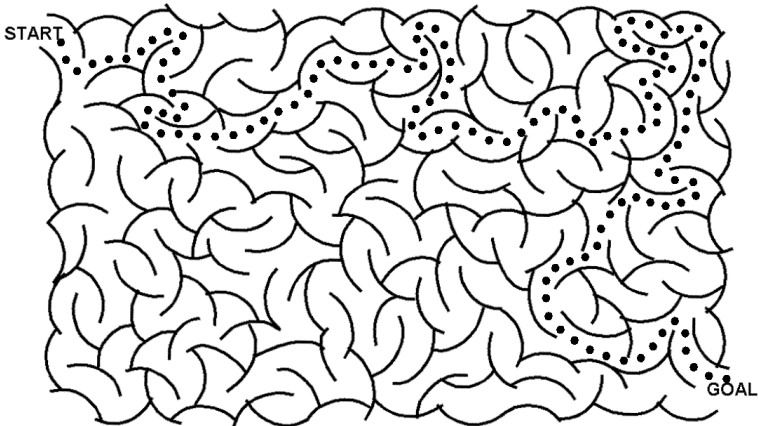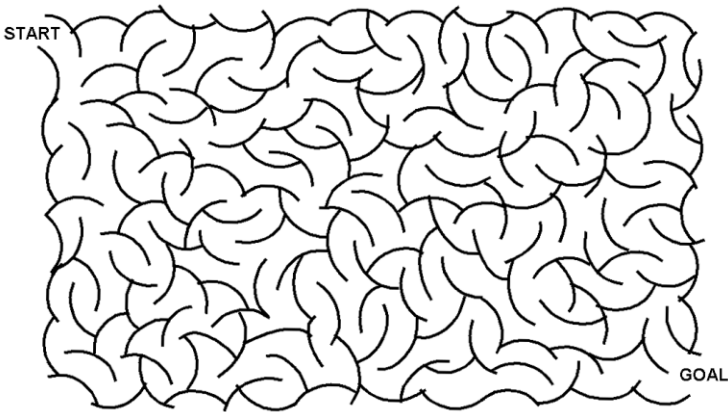
3. <u>Olympic Targets - Answer</u>

The arrow at "start" subtly points you in the wrong direction. The concentric circles make it difficult to see that the entire upper half of the puzzle is a dead end.
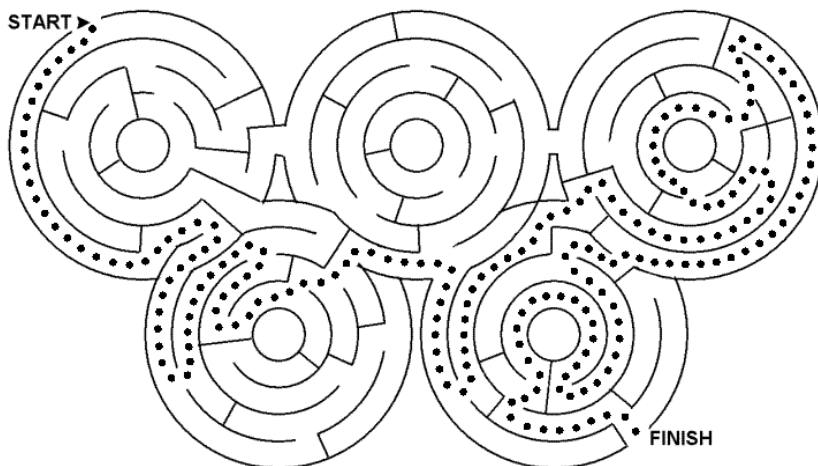
4. <u>Watership Down and Back - Answer</u>

Your mind has to "see" the path as it weaves under other paths. Otherwise, this is a very easy maze.
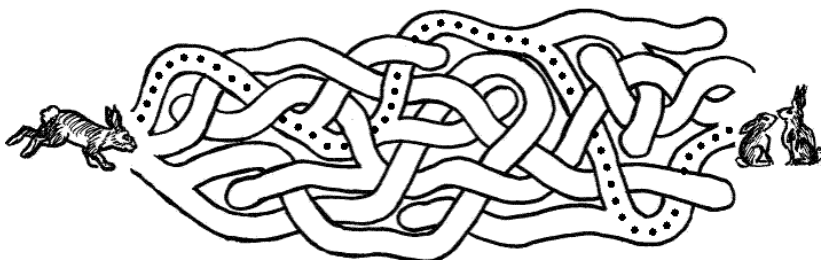
5. <u>Strings Attached - Answer</u>

The ball of string attaches to Kite 2. Kite 1 attaches to Kite 3.

6. <u>Symbolism - Answer</u>

The following diagram uses heavy lines to show all possible paths. Now it becomes obvious how to go from the right (east) side to the bottom (south) side.
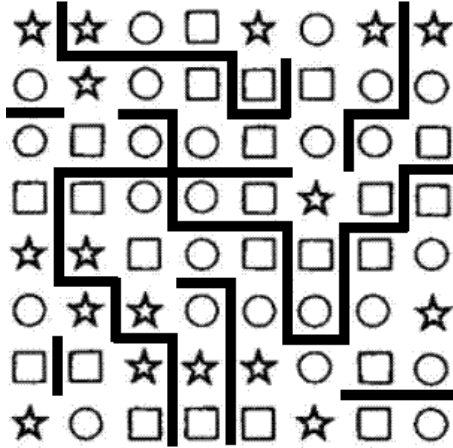
7. Functions of Three - Answer

When all of the possible connections have been calculated and drawn in heavy lines, we have a better chance of seeing our way through the maze. The correct path crosses the incorrect path and later crosses itself, as well. Go straight down to the 5, then to the 15, and then diagonally up to the right three steps. Make an arc from 7 to 10 to 30 to 27 to 24. Then zigzag to 21, 7, 10, 13, and 16. Continuing diagonally down to the left, we go to 13, 10 and 7 before we double back to 4. The last few steps take us to 12, 36, 33, 11, 14, and 42.
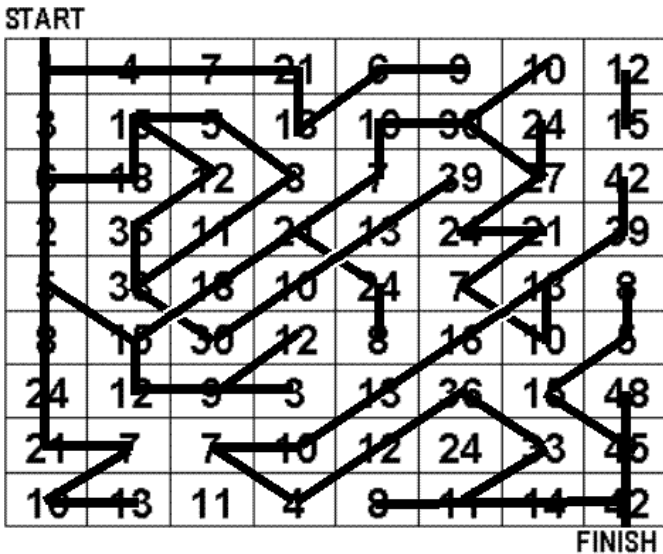
8. <u>Surreal Estate - Answer</u>

Want fast relief from this nagging back acre of confused property owners? Assuming that we cannot persuade the developer to change the gate assignments, what are the possible routes of each driveway going to look like? Ignoring the maze lines in the estate yard for a moment, we can see by trial and error that any solution is going to require the passage of at least two different paths between one of the houses and the outer wall. Close examination reveals that only the Roman Palace allows two paths between it and the outside wall.

We also see that the Charles Mansion path must be the outer one, but eventually we must conclude that this path cannot go behind Sharon Estate without blocking Sharon's path. The best way to tackle this puzzle is to start mapping each driveway from both ends; it simplifies the problem and reduces the number of choices. At Sharon's first decision point, she must go right, or she will prevent Roman from getting to his home.

Therefore, we have determined that the maze requires Sharon to go outside of the Roman Palace then to the outside of Charles Mansion, and ultimately around Sharon Estate. Roman, however, need only make two lefts, a right, and continue straight to get to his house. Charles turns right, continues straight, turns left, right, and finally left.
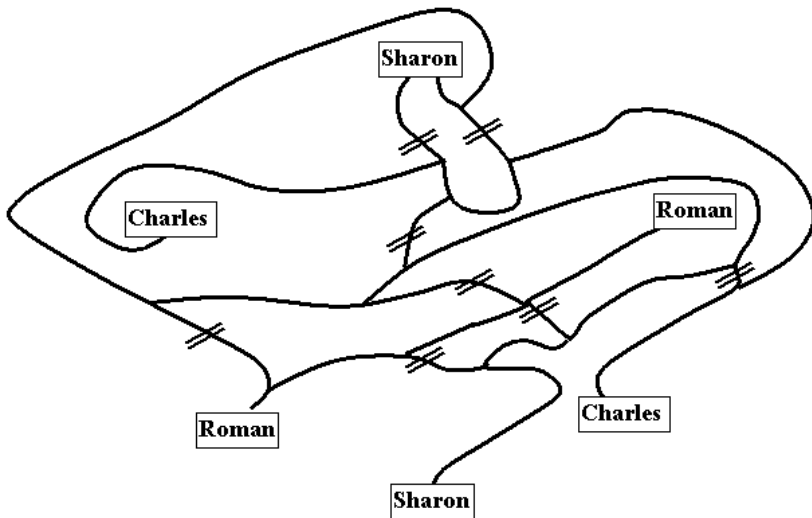
9. <u>St. Valentine's Day Massacre - Answer</u>

Diagram this maze in the same way we did in the previous puzzle and determine which corridors can't be traveled. Notice that the "e" and the "n" will need to be encountered twice, from different directions. Here are the text directions through the maze. I'll skip showing a diagram answer, so you won't see it while looking for another answer.

To spell out the word "Valentine": Veer right at the first opportunity and continue to the letter "V." Take the lower of the exits from the "V" up to the top of the heart. A hairpin turn to the right brings us to "A," and a sharp left leads to "L." A left at the next decision point takes us to "E." The upper right-hand exit from the "E" goes to "N," and continuing to apply the Left-Hand Rule brings us to "T." The upper exit from "T" leads to "I." Leaving "I" from the side exit, we should make a gentle arc through three portals to the letter "N." Dropping through the lower exit of "N" will return us to "E." Use the left lower exit from "E," go straight past three intersections, and finally jog to the left.

10. <u>Roundhouses - Answer</u>

This puzzle comes with an "Aha!" moment. What if we didn't have to worry about the turning of those pesky roundhouses? If the circles didn't turn, we could solve the maze in short order. The "Aha!" comes when we realize that we can control the turning of the circles. The instructions state that "*every time* you enter a path through one of the roundhouses..." the path will change from north-south to east-west orientation, or vice versa. This means that all you have to do is go out of and then come back into the circle to change the way it points.

Here is a solution to the maze: Find your way to the roundhouse in the upper left-hand corner. Enter it and exit in either direction (north or south). Immediately re-enter the same roundhouse and exit to the east. Find your way to the roundhouse in the lower left-hand corner. Enter it and exit in either direction (east or west). Immediately re-enter the same roundhouse and exit to the south. Make your way to the exit.

11. <u>One Black Knight - Answer</u>

The first move must be to QB4 (between the black and white pawns) because any other move would allow White the chance to capture the knight immediately (if White is allowed a turn). Obviously the black

knight cannot land on any square already occupied by a black piece. The second move will only allow K5 or a return to the original QR3 square. At move three, there are two possible directions; so, let's work backwards from the goal for a while.

Working backwards, all squares that are one knight's move away from the "X" are guarded by white. Have we proven the puzzle to be impossible? Not yet. Can we capture any of the pieces guarding these squares? Suppose the bishop could be captured (and thereby removed from the board). If so, we might attack the "X" square from KB7. But if we capture the bishop, we lose our knight to the white knight. And we would never remove the protecting knight without being attacked on the preceding move. Similarly, the pieces on the left side of the board all protect each other. Therefore, the puzzle appears to be impossible unless we are missing some trick.

The key to the puzzle is the white pawn in the center of the board. If it can be captured and the knight can move off the square, the black bishop at KN2 will **check** the white king. This "discovered check" would force White to act against the threatening bishop instead of the knight (if White were allowed to move). White cannot attack the black knight since its move must be to escape check. To remove the key pawn and complete the puzzle, the knight's moves are:

1. QR3 to QB4
2. QB4 to K5
3. K5 to KN4
4. KN4 to KR6
5. KR6 to KB5
6. KB5 to KN3
7. KN3 to K4 (Pawn capture)
8. K4 to Q6 (Discovered check)
9. Q6 to QB8 (Mission accomplished)

12. <u>Block Party - Answer</u>

Let's start by investigating the limits of the puzzle. Clearly we'll need to cross the moat. The proximity of the walls and other blocks prevents you from ever pushing blocks A, B, E, and G. Blocks I, K, L, M, P, T, X, Y, and Z can't move for the same reason. Pushing block C south traps it in a corner. Pushing it north traps us until we

push it east (through the doorway). We can't do anything more with block C for the moment.

Blocks D, F, and H have a small trap in store for us. We can push D and H west to get them out of the way, but pushing F south into the moat won't let us cross. Block J stands in our way. But if we push F north, we can then push H into the moat and cross west of block J.

Next we push block O south to enter the southeast section. The only thing we can do here is to push block W west and then push block S north into the moat. Crossing the moat on block S, we can now push block C south into the moat. This lets us enter the southwest area. We're making progress.

Blocks U and V have limited mobility. A quick analysis shows us that moving them doesn't really do us any good. We need to start clearing the traffic jam of blocks north of the exit. We push block N east, then push block Q south, and then push block R east (to where S once sat). We are now free to push block W south two squares and exit the maze.

This maze requires visual thinking and remembering where you had moved each block. As blocks sank into the moat, you were thinking three-dimensionally. Left-brain functions came into play as you analyzed your movement options at each step. You got quite a workout.

13. Two Door Hard Top - Answer

On a photocopy or a tracing paper overlay of the maze, begin by running through all the chambers that can be reached from the entrance without opening any doors. Then line through all chambers that are accessible from the exit without opening any doors. Now we could try every path to find one connecting the two darkened sections, but there might be a simpler way. The maze designer probably has only one correct path. If we find an intermediate path that can only be entered from one door on each side, we'll probably have the solution. For example, all the doors along the left side of the shaded area open to the same passageway. We can rule out these non-unique solutions.

Open the door between the fourth and fifth chambers from the right edge on the ninth row down from the top. This passage connects easily to the door between the fifth and sixth chambers from the left edge on the eighth row up from the bottom.
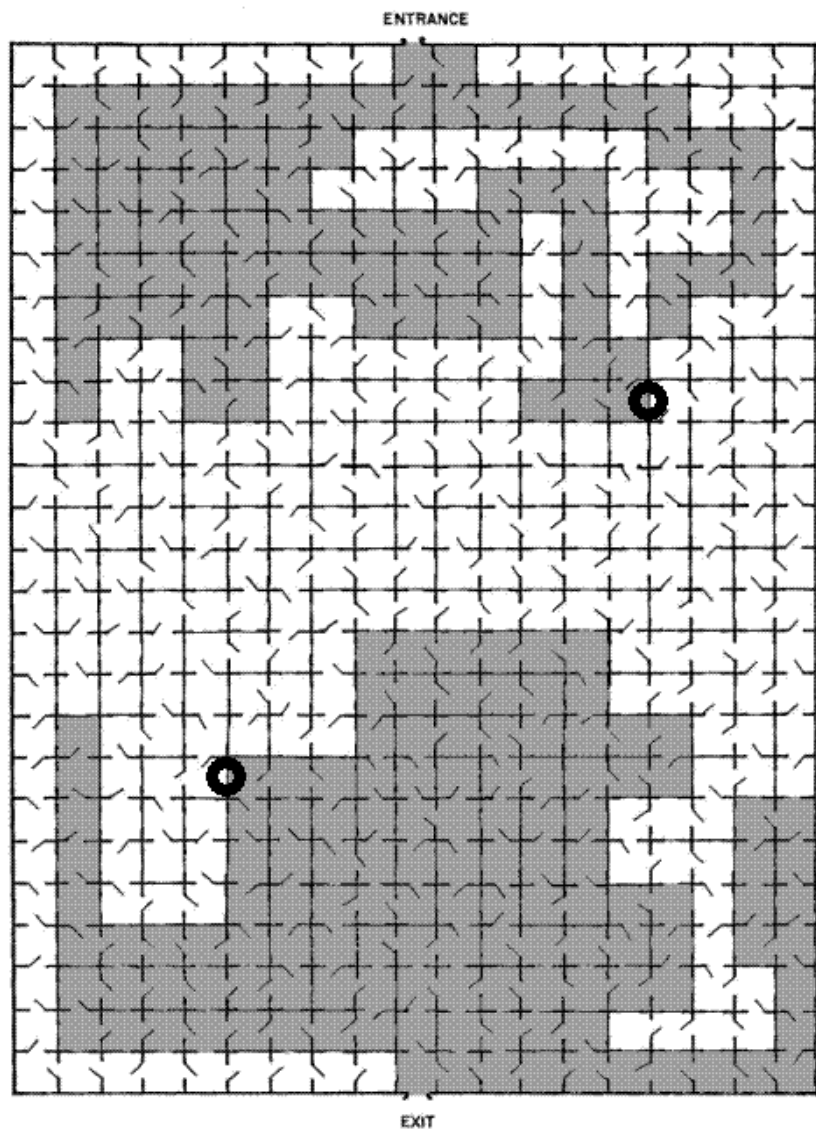
14. <u>Stop Watch – Answer</u>

Here's a diagram of Stop Watch moves. The shortest path is shown in bold face type.

1. Moving toward the bottom of the clock face early in the game proves fruitless, as you might expect.
2. At 12:35 you encounter a major trap! You must be sure to set the hour hand about half way between the 12 and the 1. Many people place it on the 12, which keeps them from reaching 9:00.
3. Note that the Left-Hand Rule places you on an endless loop between 2:20 and 5:00.
4. The right-hand rule takes a direct path to 12:45 and then dies a horrible death at 2:00, instead of diving into the center to 9:15.
5. The puzzle forces you into the center. You wind around in the center, encountering almost all of the time notations there. On several occasions you even cross your own correct path. You might begin to worry as your movement gets more restricted toward the center.
6. At 12:00 the puzzle is wide open. You weave out to 6:20 by avoiding all time notations along the way.
7. 7:15 is obviously the exit time, but note how difficult it is to work backwards.
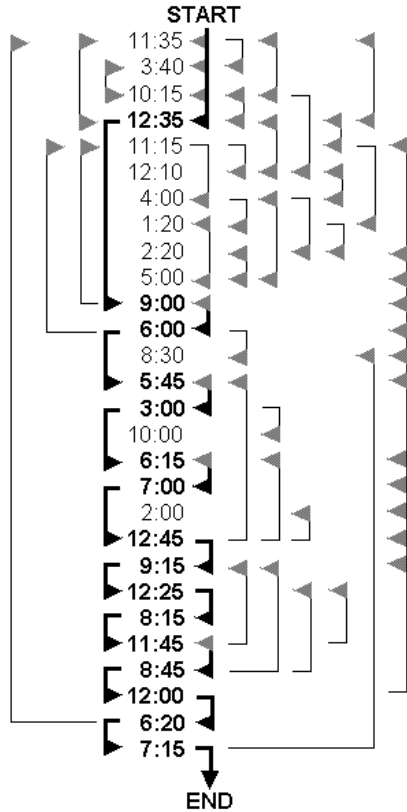
Bonus question: How many time notations can you visit on a single trip into the Stop Watch?

Answer: There are three "dead ends" (2:00, 8:30, and 10:00). Obviously, only one of them can be visited before you are trapped. It turns out that all the other times can be visited on one trip. Therefore, the answer is twenty-six (all but two).

Answers

Chapter 2 – Riddles

15. Alexander – Answer

See the chapter text for a complete explanation.

16. 50/50 – Answer

What is the word for a female pig? What is the word for a male deer? Add 50 to 50 and get 100. So the answer is 100 sows and bucks. If we take a little liberty with the sound of this phrase, it becomes one hundred thousand bucks.

17. I'm Lost – Answer

See the chapter text for a complete explanation.

18. Out for a Spin – Answer

See the chapter text for the answer. Let the visual thinking in your right brain help you see the answer in the shape of the poem.

19. Clearly – Answer

As the chapter text says, this puzzle is an acrostic. Read the first letter of each line to get the word charity. Of course, the poem also points to the same answer.

20. To the Wood – Answer

What would you look for after you got it? Perhaps it is something undesirable that you got by accident. Perhaps it is something you are trying to remove and discard. When you can't find it, you bring it home as something unwanted. "The wood" could refer to a forest, but it might also refer to a plank of lumber. What could you get from wood that would be hard to find? The answer is a splinter. It would be hard to find in your hand, so you would carry it home.

21. So Hard – Answer

Let's identify some key words: cushion, eye, hard to find, resist, punching, clothing, and strands. Think of unusual definitions/usages for the words cushion and eye? Can you relate these words to clothing and strands of thread? What is a famous old adage about something that is very hard to find? The associative function of your right brain, your memory recall, and your command of vocabulary should lead you to a needle (...in a haystack). Reread the riddle and see how

everything fits. You remove the needle from the pin cushion and thread it through the eye. Without a thimble you may hurt your hand as you slip it into clothing. The title also provides a hint with a homophone for the word "sew."

22. Can't Burn – Answer

If I can't burn, how can fire destroy me? By the heat? By the light? Even stranger, how can fire create me? Am I a disaster? In a weird sort of way a fire can both destroy and create peace. The second stanza implies that I am something with physical dimensions - probably ruling out concepts like peace or a disaster. I can move or remain still. At last I tell you that I can be seen as the hands of a clock. Clock hands can be made of metal (formed with fire but doesn't burn). The problem is that there aren't any as big as an ocean. Think of a sundial. A shadow forms the "hand of the clock." Shadows can dance and be all different sizes. They are created by light and destroyed by light.

23. Lord Byron's Riddle – Answer

The answer is not in the following words: youth, manhood, age, fool, sage, earth, sun, moon, sky, noon, sorrow, gloom, and tomb. The answer is found in the following words: infancy, history's page, morning, evening, air, sickness, pain, wit, wisdom, sin, and vain.

The best clues come when the author tells us that "I'm midway suspended in air" and "I'm the heart of all sin." As stated in the chapter text, the answer is the letter "I."

24. Letter-by-Letter Tool – Answer

See the chapter text for a complete explanation.

25. Pictorial Charades – Answer

a. The whole is the wall (part of a fortification). ① is a male sheep. ② is the place where someone separates their hair. Rampart is the answer.

b. The whole is a ruffled species of flower. ① is an automobile. ② is a country (not specifically the U.S.A.). Carnation is the answer.

c. The whole is the blaring trumpets announcing a celebrity's arrival. ① is a celebrity's admirer. ② is the money paid to a taxi driver. Fanfare is the answer.

d. The whole is to cut off the end of something. ① is a mongrel or despised dog. ② is the end of a dog. Curtail is the answer.

e. The whole is a beast of burden (carrying Sancho Panza, in this case). ① is a title of respect for a Spanish gentleman (the man of La Mancha). ② is the tool used to unlock a door. Donkey is the answer.

f. The whole is the network of wooden boards making up the hull of some ships. ① is a blueprint or strategy for building something. ② is a monarch. Planking is the answer.

26. Spelling Charades – Answer

a. The whole is the blacktop on the road. ① is a venomous snake. ② is to come to a complete stop. Asphalt is the answer.

b. The whole is a gash or cut in one's flesh. ① is used to tie a boot or shoe. ② is a packaged serving of army food. Laceration is the answer.

27. One-Line Charades - Answer

1. a word for *dads* + a word for *sample* = *pie*. The answer is pastry (pas+try).
2. a word for *guys* + a word for *cuss* = *tuxedos, etc*. The answer is menswear (men+swear).
3. a word for *has got to* + a word for *hurt* = *milk on your lip*. The answer is mustache (must+ache).
4. a word for *ardent request* + a word for *certain* = *delight*. The answer is pleasure (plea+sure).
5. a word for *bum* + a word for *calculator display* = *stomped on*. The answer is trampled (tramp+LED).
6. a word for *prisoner* + a word for *testimonial* = *give*. The answer is contribute (con+tribute).
7. a word for *wait* + an abbreviation meaning *that is* = *unmentionable* (a noun). The answer is lingerie (linger+ie).
8. a word for *fog* + a word for *corrosion* = *suspect*. The answer is mistrust (mist+rust).
9. a Roman numeral for *100* + a word for *Internet addresses* = *locks*. The answer is curls (C+URLs). Locks refers to locks of hair.
10. an abbreviation for *Monday* + a word for *before long* = *seasonal rain*. The answer is monsoon (Mon+soon).
11. a word for *allow* + a word for *entry* + an abbreviation for *yes* = *with deadly force*. The answer is lethally (let+hall+Y).

12. a word for *etiquette authority* + an abbreviation for *page* + a word for *1 = table*. The answer is postpone (post+p+one).
13. a word for *rodent* + the word *if* + an abbreviation for *that is* + an abbreviation for *satisfactory = approves*. The answer is ratifies (rat+if+ie+s).
14. a word for *former spouse* + a word for *dogs* + a word for *me* + the word *on = trip*. The answer is excursion (ex+curs+I+on).
15. a word for *staffs* + an abbreviation for *incomplete* + the word *on* + an abbreviation for *southern = plantation homes*. The answer is mansions (mans+I+on+S).

28. Playful Rascal – Answer

See the chapter text for a complete explanation.

29. Time and Space – Answer

The first part of this charade is a word meaning "the present time."
The second part is a word meaning "the present place."
The whole is a lack of place.
Combine now and here, and you get nowhere.

30. Few Can Reveal – Answer

This is a letter-level charade forming a six-letter word. Here are the letters:

RYE	found in R~~HYM~~E and VERY OBSCURE
IM	found in ~~TIME~~ not TO ENDURE
DD	found in D~~ECIDE~~ not EASY CHOICE
DD	
L	found in L~~OVE~~ not VOICE
NRE	found in ~~CONCRETE~~ and UNREAL

The whole is an enigma, so the answer must be riddle.

31. Same Time – Answer

This is a three-part charade: 1) a word meaning swindle, 2) a word meaning mutt, and 3) a word meaning payment to a landowner. The whole is a word meaning "at the same time." A swindle is a con. A mutt is a cur. A payment is a rent. The whole is concurrent.

32. Scalpel, Please – Answer

See the chapter text for a complete explanation.

33. Scarlet Plankton – Answer

See the chapter text for a complete explanation.

34. Gallery – Answer

The illustration was not intended to help you solve the puzzle. If you tried to include it in the answer, please know that it is irrelevant. To solve this riddle, you'll need to expand your definition of artist beyond a painter. Start by thinking of theatrical artists and what they "draw" (again, think of another meaning for the word "draw"). The answer is something composed *of* people not composed *by* people. Continue to look for alternate meanings of the words used in the poem. Please try to solve this one without reading any further. You will enjoy that "aha!" feeling if you do.

Here is the full explanation of the answer. Theatrical artists draw a crowd. Crowds are, at times, unlawful. Crowds are composed of people. Artistic types (performers) get a hand (applause) from a crowd. Crowds are temporary, where people sit or stand. A party's host can assemble a crowd. A host is another word for crowd. A crowd cannot be created in solitude. A gallery (as at a golf tournament) is a crowd of people. So, crowd is the answer.

35. How Like a Dove – Answer

The entire word is like a dove that flies. It could even fly over the first syllable, which appears to be an animal (omnivore). The animal is later eaten by humans. The second is a very long unit of time. The syllables are pig and eon, so the whole is pigeon.

36. Low Finance – Answer

"I" is the Roman numeral for one.
Inserting "ONE" into "MY" makes the word "MONEY".
A dollar (bill) is a one.
Take any from one, and nothing remains.
Take "NE" from "ONE" and "O" remains.
So the answer is one.

37. Rev. Spooner's Conundrums – Answer

    1. One is a dog food; the other is a fog dude.
    2. One is a sad ballad; the other is a bad salad.
    3. One is a master plan; the other is a plaster man.
    4. One is a blushing crow; the other is a crushing blow.

5. One has guns blazing; the other has buns glazing.
6. One is pouring rain; the other is roaring pain.
7. One is a pack of lies; the other is a lack of pies.
8. One is getting low; the other is letting go.

38. Wax and Wane - Answer

This riddle is called "Wax and Wane" because the answer is a series of words that get progressively larger and then smaller by one letter at a time.

A	little article
AN	article twice the size
TAN	light brown
STAN	Laurel of 'Laurel and Hardy'
STAIN	spot
STRAIN	stress
TRAIN	instruct
RAIN	cats and dogs
RAN	fled
RA	Egyptian sun god
A	top grade

39. Home – Answer

The symbol of a warm, loving home is a hearth.
Curtailed, hearth becomes heart, the center of love and emotion.
Curtailed, heart becomes hear, a way to sense the world.
Cut "hear" in half, and "he" is all that is left.

40. Beats Me – Answer

To "take heart" is to have courage.
If you "break your heart," it still beats.
If you "lose your heart," it sends you reeling.
If I "touch your heart," you feel the feeling.
If someone "steals your heart," they win your love.
What's known "by heart" you will remember.

41. Play with Me – Answer

When actors refer to "left," they mean the audience's right.
Theater people refer to downstage and upstage instead of front or back.

When a stage is "dark," it means that no show is being presented. But lights can be blazing on a "dark" stage because the actors are rehearsing.

A stage "rail" is a horizontal batten (or pipe) that supports curtains, scenery, or lights.

A stage "leg" is a small curtain at the edge of the stage used to mask the wing.

A stage "wing" is the area offstage to the right or left of center stage.

The audience comes to hear the performers, not the stage.

The theater (the stage) attracts performers, but can be the source of stage fright.

Stage "hands" tend to stay backstage, out of sight.

When a play is presented, the audience members buy tickets.

Shakespeare said "all the world's a stage," and many people have repeated it.

The riddle's title refers to a play performed with a stage.

42. Sound Reasoning – Answer

This poem is designed to grate on your sensibilities. Something is wrong with it – up until the final couplet. Let's consider each hint.

Title: I have to do with "sound" and am sometimes paired with "reason".

I am something very useful when writing love poetry.

Songwriters typically obey my rules when writing lyrics.

I am referred to as masculine (stress on the last syllable) or feminine (stress on the next-to-last syllable).

I affect almost every line of a song or poem.

The final couplet is the only one in the poem that actually rhymes.

The words that complete the other lines have the same spelling, but not the same sound.

The answer to the riddle is "rhyme."

43. Friend to Friend - Answer

Watch out! This is different from the other riddles we've seen. Think outside the box and then think farther outside the box. The capital (letter) of Sweden = "S." Put "S" at the first and last positions of our answer. Then put "MILE" in the middle and get smiles as the answer. Adam and Eve must have worn and exchanged smiles in perfect Eden.

44. Impress Me – Answer

The first letter is in "positive" but not in "source." This leaves P, I, T, V, and E.
The second letter is in "fingers" but not in "nails." This leaves F, G, E, and R.
The third letter is in "publishing" but not in "only books.' This leaves P, U, I, H, and G.
The fourth letter is in "paintings," "salons," and "nooks." This leaves only N and S.
The fifth letter is in "feet" and in "fresh dirt." This leaves F, E, and T.

The puzzle becomes much easier if you realize that each line of the poem refers to a different definition for the 'whole' word. The 'whole' is the word 'print.' Here is how the hints apply.

A print is a photographic positive - with a negative as its source.
A fingerprint isn't found on the nail, of course.
Publishing deals with print.
An art print might be found among paintings in salons and nooks.
Dirty feet leave prints.
The plural of 'print' is 'prints,' which sounds like 'prince.'

45. I Drive the Hands of Time – Answer

A spring drives the hands of a clock.
The spring season is a time of renewal when the climate changes.
A spring is a source of water, too.
Beds often have springs.
A jack-in-the-box goes up because of a spring.
To spring is to leap.
Spring begins in March.

46. Four-Part Charade – Answer

As the title states, there are four parts to this charade.
An omen, or that which indicates a fact, is a "sign."
A supposition, or expression of condition, is "if."
Me is the objective form of the word "I."
A contraction for "unable" is "cant" (can't).
The whole "significant" = full of meaning, important.

47. Easy Match – Answer

This type of riddle is what I call a ***definition blitz***. It confuses and overwhelms us with many different definitions for the same word. The real problem is that the poem doesn't have any meaning as a whole. To make any sense of the riddle we need to isolate the many synonyms it has for its single-word answer. What one word has all of the following definitions?

A good example, fair, delicate, wanton, dizzy, happy, flighty, bright, nimble, form of energy, land, happen, strike suddenly, come up less than normal, soft, way in which a thing is seen, a window, uncomplicated meaning, knowledge, animate, not intense, not hard, not weighted, not serious, expression, unstressed, crumbly, and easy to digest. Even the title has two definitions: easy and match.

A good example is like a beacon. A fair complexion means that one has light colored skin or hair. A nimble person is light on his feet. To "land" is to light on the ground. Knowledge brings facts to light. By now, you probably see that "light" is the answer.

Answers

Chapter 3 – Discovering the Rebus

48, Basic Rebus – Answer

The first six puzzles in this chapter are explained in the chapter text.

49. Rebuses *a la Concentration*

50. Boxed Rebus – Pictures - Answer

51. Boxed Rebus – Words - Answer

52. Boxed Rebus – Homophones - Answer

53. Boxed Rebus – More Tricks - Answer

54. Boxed Rebus – On Your Own - Answer

The words "trip fare" form a circle. The answer is "round trip fare."
Deep at the bottom of the box is a space and "probe." The answer is "deep space probe."
The words "a fuss" are raised up. The answer is "raise a fuss."
The symbol represents "sum." "The rain" is formed into a bow. "Sum where" is over "the rain" bow; the answer is "somewhere over the rainbow."
"Dressed" is written up, and "nowhere" is packed 'to go.' The answer is "All dressed up and nowhere to go."

55. Boxed Rebus – Getting Tougher - Answer

We see a letter, a symbol for per, and "fect." The answer is "letter perfect."
A syringe (needle) is inside the letter "A" followed by a stack of "hay." The answer is "needle in a haystack."
The symbol represents the word "man." All four seasons are listed at the end. The answer is formed as "a man for all seasons." The hint refers to the Robert Bolt play about Sir Thomas <u>More</u>.
The word "just" is inside the word "the." The word "time" has a nick notched out of it. The answer is "just in the nick of time."

56. Tangled in Your Shorts – Answer

1. Wise, or too wise (two Y's)
2. Tennis (ten S)
3. Empty, or mount
4. Decay

5.   Use, or to use (2 U's)
6.   Decency (D cent C)
7.   Forequarters (four quarters)
8.   Expound (X pound)
9.   Piper (pi per)
10. Rosy (rho Z)
11. Denote (D note)
12. Beaten (B ten)
13. Exotic (X aught tick)
14. Decipher (D cipher)
15. Naughty (naught E)
16. Sizeable (psi's a bull)
17. Crabby (crab E)
18. Ramble (ram bull)
19. Expense (X pence)
20. Effete (F feet)
21. Excuse (X Q's)
22. Enlighten (N lye ten)
23. Along
24. Irony (iron E)
25. Caper (K per)
26. Alfalfa (alpha alpha)
27. Arctic (arc tick)
28. Naturally (natural E)
29. Pointless
30. Restless
31. Sometimes (sum times)
32. Morsel (Morse Code for L)
33. Oolong Tea
34. Defeat any enemies you have (D feet N E N M E's U half)
35. Resistance led to assault and battery (resistance lead two A salt and battery)
36. Some Europeans are romantic (Sum U rho P N's R rho man tick)

57. Boxed Rebus - Reprise - Answer

"Hook" is way off to the left. "Cut" is in the upper right-hand corner. Therefore, we see "a left hook and a right upper cut."
The numeral "4" is broken into three pieces. The answer is "go for broke."
"EZ" stands for "easy." "As" is falling off of a "log." The answer is "easy as falling off a log."

"A^2" is pronounced "A squared." The insects are ants. The answer is "a square dance."

58. Boxed Rebus – Tougher Still - Answer

We see a fly by the backside of a pair of pants. The answer is "fly by the seat your pants."

Eye is pronounced "I." The girl is singing. That makes "I sing" or "icing." The icing is on a cake of soap. The answer is "icing on the cake."

Three colors are flying through a mountain pass. The answer is "pass with flying colors." The hint refers to something that is easy (a breeze).

The crayon has a picture of a rose where the name of the color usually appears. It is coloring some drinking glasses. The answer is "rose-colored glasses."

59. Maximized Pictures - Answers

1. Bird + sofa + feather + f+lock + two + gather = Birds of a feather flock together.
2. Idol + hands + R + thud + devils + tools = Idle hands are the devil's tools.
3. Ace + sing + gull + pick + chairs + worth + 1,000 words = A single picture's worth a thousand words. "Worth" is Mary Worth, a character from old Sunday newspaper comics.
4. Weigh + knit + rein + sit + pores = When it rains it pours.
5. Fools + Russian + w+hare + angel + sphere + toot + red = Fools rush in where angels fear to tread.
6. Pride + ghost + beef + oar + ruff + awl = Pride goes (goeth) before a fall.
7. Gnome + Anacin + eye + Landon + two hymns + elf = No man is an island unto himself.

60. Howdunit? - Answer

The pictured people are Ann Landers (her pose in the long-running advice column) and Ted Kennedy (U.S. Senator and political figure). Knowing that, let's consider the rebus. Ann inn+shoe+r+ants inn+vest+i+gate+oar four a three store+E f+wrench mu+Z+m k+west+shun+d A k+rim+inn+awl f+rum pear+S "who" add+mitt+Ted burglar+eye+sing t+hat mu+Z+m A f+ewe knights B+four. N+tar+ring Ann nun+guard+dead, O+pen, first floor door, the burglar two+k awl sail+a+bull R+tickles without bee+ing

note+ice+d. "How" can the burg+lar's store+E bee true w+hen awl g+round level doors R lock+d and guard+dead?

Correcting the spelling, the problem reduces to:
"An insurance investigator for a three-story French museum questioned a criminal from Paris who admitted burglarizing that museum a few nights before. Entering an unguarded, open, first-floor door, the burglar took all saleable articles without being noticed. How can the burglar's story be true when all ground-level doors are locked and guarded?"

The rebus is solved, but the puzzle remains. The answer to the problem lies in the French custom of referring to the "first floor" as the first story <u>above</u> ground level. Americans start counting at the ground floor and can be confused by the burglar's statements.

61. <u>Cartoon Rebuses – Answer</u>

Singer and Dancer (7,7) - Key words might be: car, sun, ray, hot, tree, jack, cell, call, card, sweat, my, tire, is. "Jack" and "call" appear to be particularly obvious. Limit your search to people with "jack" in their names who are known for dancing as well as singing. The best bet seems to be combining "sun" with "jack". The answer is Michael Jackson (MY+CALL+JACK+SUN).

Book and Movie (4,2,3,5) - Key words might be: hat, rings, dove, tie, roses, the, lore, tells, us, that. "Rings" and "lore" appear to be particularly obvious. The pattern of small words in the answer suggests titles like: "Call of the Wild" (only four letters in the last word) or "Wind in the Willows" (too many letters in the last word). "Dove" allows us to create "...d of ". The answer is Lord of the Rings (LORE+DOVE+THE+RINGS).

Canadian Place Name (8) - Key words might be: cat, man, knit, purl, ball, yarn, vest, oh, is, hard, bah. "Bah", "oh", and "knit" appear to be particularly obvious. Why was it called a "place name" instead of a city or province? Maybe it's the name of a lake or mountain range. Why isn't the clue more specific? The answer is this: There are so few provinces in Canada that a clue like "Canadian Province" would make the puzzle too easy. The answer is Manitoba (MAN+KNIT+OH+BAH).

U.S. City (8,7) - Key words might be: bed, collar, arm, leg, head, spring, cast, add, it, up, I, owe. "Cast", "add", and "springs" appear to be particularly obvious. Very few cities are as long as 8 and 7 letters.

Long city names include: Rancho Santa Margarita, Truth or Consequences, Chancellorsville, Mooselookmeguntic, Chickasawhatchee, Winchester-on-the-Severn. None of these are any help. "Springs" could be the second word. A Google search of cities ending in "springs" reveals the answer on the first page: The answer is Colorado Springs (COLLAR+ADD+OWE+SPRINGS).

European Capital City (8) - Key words might be: horn, tail, key, door, sin, all, hope, hell, you, here. "Key" and "sin" appear to be particularly obvious. European countries with 8-letter capital cities are: Belgium (Brussels), Bosnia and Herzegovina (Sarajevo), Finland (Helsinki), Hungary (Budapest), Moldova (Chisinau), and Serbia (Belgrade). The answer is Helsinki (HELL+SIN+KEY).

Singer/Actress (7) - Key words might be: mud, boy, hose, mess, stain, uh, it, on, me. "Mud" and "uh" appear to be particularly obvious. Very few celebrities go by only one name: Ashanti, Beyonce, Brandy, Charo, Cher, Jewel, Madonna, Oprah, Pink, Sade, Shakira, and Vanity. The answer is Madonna (MUD+ON+UH).

62. <u>Letter Arithmetic Rebuses - Answer</u>

1. Coin + toys + ham – moon + well – sew =
    C~~OIN~~TOY~~S~~HAM~~W~~ELL = city hall
2. Gull + five + first + tray – fifty + veils – i =
    GULL~~FIVE~~FIRST~~TRAY~~VE~~I~~LS = Gulliver's Travels
3. Saw + hen + pint + hoe – soap + cob + four + seal + golf – golf +
    hump – lamp + mane – b + vents =
    SA~~W~~HEN~~P~~INT~~HO~~E~~COB~~FOURSEAL~~GOLF~~HUM~~P~~MANEVEN
    TS = When in the course of human events (the beginning of the
    American Declaration of Independence)
4. Fold + blow + three + taxi – bride + yell + cow – cat + brim +
    stack – ax + rope – stem + toad – top =
    FOL~~D~~BLOWTH~~REE~~TAXI~~Y~~ELL~~C~~OWBRIM~~STA~~CKROPE~~TO~~A
    D = follow the yellow brick road (from ***The Wizard of Oz***)

Note: The third puzzle was first-delete. You can see this by noting that the picture for "golf" appears as an add word and is followed immediately by "golf" as a subtract word. If the puzzle were last-delete, the pictures would just cancel each other out and make no contribution to the final answer.

63. Boxed Rebus – Final Set - Answer

Someone is driving "me" to "k" with "dr" inside of it. "Dr" in "k" makes "drink." The answer is "drive me to drink." The hint refers to a designated driver who drives you to and from drinking.

"0" is nothing. "222" are twos. The body parts pictured are knees. "@" is "at." Nothing twos knees at makes the answer "nothing to sneeze at."

"×" is like at the bottom of a romantic letter, and "make" is going up. The answer is "kiss and make up."

The word that is circling in the picture is "making." The answer is "making ends meet."

Pronounce the three letters "B", "U", "T." "Is" sits on "ly." The letters "sk" are in "deep." B-U-T becomes "beauty" followed by "only" followed by "sk" in deep." The answer is "beauty is only skin deep."

This rebus uses the Greek letter psi, some lenses, the chemical symbol for gold, and "N." Strung together, they are "Psi lenses gold N." The answer is "silence is golden."

Four "services" are above and beyond the rest of the message. "The" is followed by a crow's speech balloon. Then comes "love" and "do" "T." The phonetic answer is "Four services above and beyond the caw love do T." The answer is "for services above and beyond the call of duty." The hint refers to the fact that these are words said during a ceremony where someone is being decorated for distinguished service.

64. <u>World Literature 10 - Answer</u>

1. William Shakespeare's comedy play, *Twelfth Night*. Arrow points to the twelfth chess knight.
2. Pulitzer prize-winning novel in 1937 by Margaret Mitchell, *Gone with the Wind*. G (on) e (with) the w (in) d.
3. Pulitzer prize-winning novel in 1960 by Allen Drury, *Advise and Consent*. Add vise and c (on) cent.
4. Mark Twain's 1869 European adventures, (*The*) *Innocents Abroad*. "N" "O" cents "A" (broad).
5. Pulitzer prize-winning novel in 1952 by Herman Wouk, *The Caine Mutiny*. The cane mu (Greek letter) tin (chemical element symbol) "E."

6. Jules Verne's 1874 story of castaways on (*The*) *Mysterious Island*. Mister "E" "S" "I" l+and.
7. Pulitzer prize-winning novel in 1945 by John Hersey, *A Bell for Adano*. Abe "L" four add (on) "O."
8. Ernest Hemingway's 1929 novel A Farewell to Arms. (Musical notes) A, fa, re well two arms.
9. Aldous Huxley's satirical novel in 1932, *Brave New World*. (American Indian) brave new world (botanical symbol for western hemisphere).
10. From 1860, Charles Dickens's *Great Expectations*. (Great) "X" (specked) "A" ti (on) s.

65. <u>Hall of Fame - Answer</u>

The best way to identify the pictures is to recognize them from your personal experience. I doubt that there are many people on earth who could do that. Another approach is to show the pictures to friends and ask their opinions. The more people you include, the better chance you have of success. Also remember that you don't need to identify every face to start guessing what the message is.

Hints to the identities of the famous people (left to right, top to bottom):
1. The first person rose to celebrity status as a movie actor in the 1990's. He was born in London. Most of his fame has come from his work in romantic comedies. He has played opposite leading ladies like Andie MacDowell, Julia Roberts, Renée Zellweger, Sandra Bullock, and Drew Barrymore.
2. The second person first made a name for herself in movies as a teenager in the 1980's. Her acting career accelerated in the early 2000's when she won the Oscar for best supporting actress in 2001. She has played opposite leading men like David Bowie, Russell Crowe, and Leonardo DiCaprio.
3. The third person was a popular singer and actress in the mid-twentieth century. Many of her songs became hits. She starred on screen with Frank Sinatra, Clark Gable, Rock Hudson, and James Garner, to name a few. She even sang in an Alfred Hitchcock movie, winning the Oscar for best song in 1956.
4. The fourth person was a newspaper editor and politician in nineteenth century America. He is often attributed (perhaps incorrectly) with the quotation "Go west, young man." He ran for President but was soundly defeated by Grant.

5. The fifth person is another twentieth century movie star. He is arguably one of the greatest actors in the history of film, appearing in more of the AFI Top 100 Movies than anyone else. One of those movies airs on television every Christmas.
6. The sixth person was a twentieth century politician in America. He graduated from Stanford University and went to work as an engineer. He entered politics after WWI. The 1929 stock market crash happened during his presidency.
7. The seventh person founded a magazine publishing company in the 1950's. He promoted a man-about-town lifestyle. He also published some calendars.
8. The eighth person was an eighteenth century German philosopher. He wrote several famous "critiques" of pure reason, practical reason, and judgment. He is associated with metaphysics and epistemology.
9. The ninth person was an American actress (and sex symbol) who succeeded in both Vaudeville and motion pictures. She is known for her many suggestive and witty quotations. She starred with leading men like Cary Grant, Randolph Scott, and W.C. Fields.
10. The tenth person is an actress who became famous in the 1950's. She starred opposite William Holden, Jack Lemmon, Frank Sinatra, and the fifth person on this hall of fame rebus. She graced the cover of *Time Magazine* and also appeared in the magazine of the seventh person on this list.
11. The eleventh person is a fictional character created by Charles Lutwidge Dodgson (who wrote under a different name). She is holding a bottle with a tag. We are looking for the missing word on that tag.

Once you think you have identified a fair percentage of the people:
1. Try to guess which name (given name or surname) was intended. If you can think of a more prominent and recognizable person with the same last name, this puzzle is probably looking for the person's first name. Shorter names are more likely than longer names because they are generally easier for the creator to use.
2. String all of the guesses together into a continuous stream of words. Use "uh" once or twice where there is a word you haven't yet figured out.
3. Pronounce each syllable with equal stress in a monotone voice.
4. When one syllable ends with a sound that the next syllable starts with, consider slurring them together into a single sound.

5. If no answer suggests itself, try saying it with a British accent, a Brooklyn accent, a Southern accent, etc.
6. If you think you have found any fragment of the answer, look up that phrase to find sayings that contain it. Then see if you can make the other pictures/words fit the saying.

Here are the names that we were looking for: Hugh Grant, Jennifer Connelly, Doris Day, Horace Greeley, James (Jimmy) Stewart, Herbert Hoover, Hugh Hefner, Immanuel Kant, Mae West, Kim Novak, and "drink" (the missing word from the bottle in *Alice in Wonderland*). Let's choose "Hugh" as the first word, because Ulysses Grant and Cary Grant are probably more easily recognized. There are probably a few other Jennifers we could have chosen, so let's choose "Connelly" next. "Day" is simpler and shorter than Doris. Either name might work for Horace Greeley; "Horace" is one letter shorter. Jimmy or James is shorter than Stewart, but "Stewart" happens to be the answer in this case. Herbert Hoover is another toss-up. "Hoover" is perhaps more logical, but "Herbert" is correct in this particular case. "Hugh" is shorter than "Hefner" and has that "you" sound. "Kant" is shorter and probably more usable than "Immanuel." "Mae" is shorter than West. "Kim" is shorter than Novak. Here is the string of syllables I was looking for: hue-kahn-uh-lee-day-hoh-russ-stoo-wahrt-her-burt-hue-kahnt-may-kim-drink

"May-kim-drink" sounds like "make him drink." If we look this up in Google, we find the adage "You can lead a horse to water, but you can't make him drink." We have to take some liberties with a few of the sounds, but this proverb seems to be our answer. The string of "lee-day-hoh-russ-stoo" is very much like "lead a horse to." We have our answer.

66. Building the Word – Answer

Look up "megalithic structure" in www.thefreedictionary.com or in Wikipedia, and you'll find the words "dolmen" and "cromlech" to be synonyms. We'll have to look at letters being subtracted to decide which is correct. The next picture is a balloon-shaped mushroom with a mosaic look to it. A search of mushroom pictures suggests a few possible names: agaric, blewit, cep, morel, morchella, porcino, and puffball. Remember that this is a subtracted word, so each of its letters must appear in the first word. "Morel" is contained in "cromlech." What looks like a "mosaic" pattern in the picture could

actually be cavities in the surface. I think we've found the second word.

Look up Egyptian gods on Google, and find the one with the head of a jackal. It is Anubis. Look up "Japanese gateway" in a search engine, and you'll quickly find the word "torii." Look up "wooden shoe," and a thesaurus will suggest the word "sabot" or possibly "clog." "Sabot" can be subtracted from our accumulated letters, but "clog" cannot.

At last we've come to an easy one, a door. The simplicity of the artwork suggests that we aren't looking for some esoteric synonym. Let's use "door." The "III" is three I's, not a Roman numeral three. We can subtract three I's, but we can't subtract "three."

Without the wings extended it's hard for anyone to identify a bird like this. It looks like a vulture, but we don't have the letters to do the subtraction. A list of similar-looking birds leads us to "condor." We are down to the most obscure word in the puzzle. It is particularly hard to find because of an accent mark over the first e. If we look up "spire" in Wikipedia, we're advised to also see "Flèche." It shows us a steeple on Norte Dame that looks like the picture. The next two subtractions ("eel" and "f") confirm that we have the right word.

Here is the detailed analysis:

Cromlech	CROMLECH
– Morel	C~~ROMLE~~CH
+ Anubis	CCHANUBIS
+ Torii	CCHANUBISTORII
– Sabot	CCHAN~~UBISTO~~RII
+ Door	CCHNUIRIIDOOR
– III	CCHNU~~IRII~~DOOR
– Condor	~~CC~~H~~N~~UR~~DOOR~~
+ Flèche	CHURFLECHE
– Eel	CHURF~~LECHE~~
– F	CHUR~~F~~CH

So, the answer is "church." I made a feeble attempt to hint at the final answer by a common theme in the pictures selected. Many of the tougher words had a religious connection: torii, flèche, Anubis, and even cromlech. The title of the puzzle might also provide a hint; a church is a "building", and "the Word" is associated with Christian gospel.

Answers

Chapter 4 – Disguised Writing

67. <u>Positive/Negative Text – Answer</u>

See the chapter text for a complete explanation.

68. <u>Animal Hides – Answer</u>

Give yourself 50 bonus points if you found some that I missed.
1. ape gorilla: **<u>A pe</u>**ar made I**<u>gor ill a</u>**t lunch.
2. beaver, lion: Descri**be a ver**y cute gir**l I on**ce dated.
3. goat koala: Have a **go at** pachin**ko, a la**dy's game.
4. alpaca ass cassowary: What made the **alpac*as so* wary**?
5. mouse bear frog: Eski**mo use**d to **be a r**are kind o**f rog**ue.
6. bison buffalo: Bo**b is on** TV to re**buff a lo**ver.
7. ostrich hyena: He's alm**ost rich** wit**h yen a**nd dollars.
8. jackal whale: Hi**jack a l**uxury liner belo**w Hale**akala.
9. cat shrimp impala: Exe**c at**e *shr**imp a la*** king.
10. teal ewe eland bear: S**teal** j*ew**el and** gra**b ear**rings.
11. dingo hog hedgehog: Stan**ding o**n the nort**h edge? *Hog***wash!
12. cow owl tortoise: Magi**c *owl*** is men**tor to Ise**ngard.
13. ocelot otter ram: Jim Cr**oce *lotter*y** winner is f**ram**ed.
14. seal shrew zebra: Mental exerci**se al**ways develops a **shrew**d, large-si**ze bra**in.
15. llama camel dog: Wi**ll a ma**n who **came l**ate **do g**ood work?
16. bat ant tiger germ mina (variant of myna) wallaby: **Bat**he pl*ant I germ*ina**ted in rene**wal lab y**esterday.
17. wasp asp mole lemur emu jaguar: I kne**w a sp**y *mo**le mur***dered by nin**ja guar**ds.
18. fox: Life is like a bo**x of** chocolates.
19. elephant: Use his foo**t? Nah, Pele** uses his head.
20. cheetah: What do you **hate, eh? C**rashing?

69. <u>Camouflaged Birds – Answer</u>
1. grouse, swift: Some people **grouse** about **swift** action.
2. goose, eagle: Clean up that **goo se**eping down until the ar**ea gle**ams.
3. swallow, falcon: Pig**s wallow** in of**fal con**stantly.
4. swan, finch: Goat**s wan**der of**f in ch**illy weather.

5. kingfisher, flamingo: Coo**king fish er**ased the odor of **flaming o**nions.
6. owl, pigeon: Men, n**ow l**ong dead, domesticated the **pig eon**s ago.
7. raven, magpie: I got cob**ra ven**om fro**m a GP (i.e**., family doctor).
8. oriole, condor: I'm flying t**o Rio, le**aving on the se**cond or** third.
9. toucan, canary, mallard: Give the *tou**can a ry**e* cracker with ani**mal lard**.
10. drake, gander, parakeet: Hol**d rake** or similar thin**g and er**roneously dro**p a rake, et**c.
11. pheasant, dove, crane: What a catastro**phe as ant**s swarme**d over** our picni**c - ran e**verywhere!
12. kiwi, emu, robin: Loo**k, I wi**ll remove th**em u**ntil ze**ro bin**ary digits remain.
13. wren, cardinal, lark, pelican: No**w ren**owned *Cardina**l Ark**in* will read a gos**pel I can** relate to.
14. gull, chick, chicken, cock, cockatiel, rook: A **gull**ible, rusti***c hick* en**tered to cold***cock a tiel*ess c**rook**.
15. penguin, guinea fowl, owl, crow, jay: There, among groves of as**pen, *guin*ea *fowl* crow**ded around **Jay**.

70. Bananas Splits – Answer

Here are the phrases with the proper spacing, punctuation, and capitalization.

1. So, physician, heal thyself.
2. There are none so blind as those who will not see.
3. Come to where the flavor is.
4. Strike while the iron is hot.
5. Is a new house often set on wood supports in steadfast reinforcement?

71. The Mondegreen Cipher – Answer

1. Call a spade a spade.
2. Marry in haste; repent at leisure.
3. Two's company; three's a crowd.
4. I'll be home for Christmas.
5. My love knows no bounds of time or space.

72. <u>A Rag Man Solved this Puzzle (anagram) – Answer</u>

1. Poser	10. Silence	19. Safer	28. Pointer
2. Dealer	11. Pares	20. Sheet	29. Credit
3. Shears	12. Steak	21. Recaps	30. Strafe
4. Rifle	13. Tires	22. Ideas	31. Pleats
5. Stain	14. Pest	23. Inks	32. Snipe
6. Night	15. Ache	24. Denied	33. Fringes
7. Strap	16. Elbow	25. Garnets	34. Idolatry
8. Tones	17. Design	26. Tough	
9. Luster	18. Diet	27. Triangle	

73. <u>Double Exposures – Answer</u>

1. Paste, tapes
2. Steer, trees
3. Danger, garden
4. Teacher, cheater
5. Reward, drawer
6. Petal, plate, pleat

74. <u>Just Desserts – Answer</u>

Explained in the chapter text.

75. <u>Gargled in Tarnsmission – Answer</u>

1. *Feast* should be *fast*. Drop the "e". Waist not. Want not.
2. *Wings* should be *winds*. Change "g" to "d." Without wings, he would fall like a brick.
3. *Tarp* should be *trap*. Switch "a" and "r." James is a devious deer.
4. *Coma* should be *comb*. Change "a" to "b." It lost its teeth to gum disease.
5. *Sings* should be *signs*. Switch "n" and "g." Signing refers to sign language.
6. *Nosiness* should be *noisiness*. Add an "i." Gossip is OK unless you shout it.
7. *Painted* should be *printed*. Change "a" to "r." Walter is typesetter, not an art critic.
8. *Needless* should be *needles*. Drop an "s." A sewer is someone who sews.
9. *Witness* should be *witless*. Change the "n" to "l." The lawyer's client adopted a foolish position.
10. *Mission* should be *omission*. Add an "o." His lack of understanding was a problem.

76. <u>Office Gear – Answer</u>

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Cipher Alphabet:  ABCDE FGHIJ KLMNO PQRST UVWXY
Original Message: FSQPB JLADW TGOKI VXCEH NYRUM
    STAPLER            MICROWAVE OVEN
    CLOCK WATCHER      BROWN BAG LUNCH
    TELEPHONE          CUBICLE
    MOUSEPAD           KEYBOARD
    DESK DRAWERS       XEROX PAPER
    COFFEE MUG         CALENDAR
    MICROSOFT WINDOWS  FAX MACHINE
```

77. <u>Two One-Liners One – Answer</u>

Let's start with the small words. The single letter G probably stands for A or I, most likely A because of where the word appears in the sentence. The three-letter word after the comma is likely to be AND or BUT. If G stands for A, ZJB isn't AND. If these guesses are right, we would expect G and B to appear frequently because they represent A and T. Both are common in the cipher text and appear in places we would expect to see them. Let's try substituting A and BUT for G and ZJB.

The second line has L'E. If this is normal speech, the word is likely to be I'M (or I'D). The third word on the first line is a two-letter word starting with B. It could be BE or BY, but the cipher has Y as the second letter. A cipher doesn't substitute a Y for a Y. The Y must stand for E. Y is a very common letter in the cipher, so this looks right.

H*ette*IK T*a*A *be* K*ea*H*ew* O*it*R *a* Q*i*KK*, but* NAHV
T*u*SS*e*IO*a*I*e** H*et*K VN*u* K*ea*H O*it*R *a bu*IS.
I'm H*au*UR*i*AU *a*HH *t*R*e* O*a*V *t*N *t*R*e ba*AQ. OR*ea t*R*e*V K*ee*
*m*V S*a*VTR*e*TQ*, t*R*e te*HH*e*IK H*au*UR *t*NN.

The word BRY appears three times in the second line. It has the format T_E. Let's guess that R stands for H. The two-letter word BN starts with a T; it is probably TO. The first line has a three-letter word with the pattern _OU. V stands for Y.

H*ette*IK T*a*A *be* K*ea*H*ew* O*ith a* Q*i*KK*, but o*AH*y*
T*u*SS*e*IO*a*I*e** H*et*K *you* K*ea*H O*ith a bu*IS.
I'm H*au*UH*i*AU *a*HH *the* O*ay to the ba*AQ. O*he*A *they* K*ee*
my S*ay*THE*t*Q*, the te*HH*e*IK H*au*UH *too.*

The words THEY, MY, and TOO confirm that our guesses were correct. The word OLBR has the pattern _ITH; it is probably WITH. The next to last word on the second line has the pattern _AU_H. This word is almost certainly LAUGH.

*Lette*ɪᴋ ᴛᴀ*a be* ᴋ*eale*ᴡ *with a* Qɪᴋᴋ*, but o*ᴀ*ly*
*Tu*ꜱꜱ*e*ɪᴡᴀɪ*e* let*ᴋ *you* ᴋ*eal with a bu*ɪꜱ*.*
*I'm laughi*ᴀ*g all the way to the ba*ᴀQ*. whe*ᴀ *they* ᴋ*ee*
my ꜱ*ay*ᴛʜᴇᴛQ*, the telle*ɪᴋ *laugh too.*

Look at the second line as a complete thought:

I'm laughi_g all the way to the ba__. When they _ee my _ay_he__, the tell__ laugh too.

You may recognize the entire joke, but everyone will at least see LAUGHING and BANK. Now the first line looks like:

Lette__ _a_ be _eale_ with a _i__, but only Tu__e_wa_e* let_ you _eal with a bu__.

We see that the word LET_ is probably LETS. The S fits wonderfully into both lines. LETTE_S should be LETTERS. We are almost done.

Letters ᴛ*an be seale*ᴡ *with a* Q*iss, but only*
*Tu*ꜱꜱ*erware* lets you seal with a bur*ꜱ*.*
I'm laughing all the way to the bank. When they see
my ꜱ*ay*ᴛʜᴇᴛ*k, the tellers laugh too.*

The first line seems to start: *Letters can be sealed with a kiss....* This would make the unknown word in the second line _AYCHECK. Now we can complete both lines.

Letters can be sealed with a kiss, but only Tupperware lets you seal with a burp.

I'm laughing all the way to the bank. When they see my paycheck, the tellers laugh too.

```
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
N T - - M - A L R U S I - O W - K H P C G Y D - E B
```

78. Two One-Liners Two – Answer

The letters with the highest frequency in the cipher are I and E. In normal speech these would stand for common letters like E and T.

The word EJI appears three times in this small sample. If I stands for E and E stands for T, this common word becomes THE. If this is correct, the word JI stands for HE and EJIL stands for THEN, THEY, or THEM.

Before we decide that our guess about THE is correct, let's look at the two small words O and OE. If E stands for T, OE could be either IT or AT. Because the OE appears at the end of two different sentences, it is more likely to be IT. Let's take a chance that EJI = THE and OE = IT. Substituting for these four letters we get:

*The*L H*is*ht P*iYe* MT*t*D TVR RXSD. *He* BFX*te the* KF*e*VGK*ti*TP, UG*t* D*he* SX*t he*F MPTGD*e i*Vt*x* it. *the* R*e*Z*i*P WTR*e* W*e* RX *it. He* BTDV'*t* TM*t*GTPPL KF*e*D*e*V*t* T*t* *the ti*W*e,* UG*t I* YVXB *he* BTD F*e*DKXVD*i*UP*e.*

The word TE has the format _T and must be AT if our guess about IT was correct. This results in the phrase AT THE TI_E. TIDE, TIKE, TILE, TIME, TINE, and TIRE are possible answers. TIME seems to be the best choice. If W stands for M, the word ME appears in the second line. This tends to confirm our decision. The word in the first line with the pattern _HE can't be THE, so it must be SHE. So far:

*The*L H*is*ht P*iYe* M*ats a*VR RXS*s. He* BFX*te the* KF*e*VGK*tia*P, UG*t she* SX*t he*F MP*a*G*se i*Vt*x* it. *The* R*e*Z*i*P *ma*R*e* *me* RX *it. He* B*as*v'*t a*M*t*G*a*PPL KF*ese*V*t at the time,* UG*t I* YVXB *he* B*as* F*es*KXV*si*UP*e.*

Two words after SHE is a word with the pattern HE_. This is probably HER. We know that the first word on the first line isn't THEM (it doesn't end in M). It is either THEN or THEY. Because the rest of the line refers to HE and SHE, let's choose THEY. The word with the apostrophe on the second line probably ends in N'T. It is either HASN'T or WASN'T, but it can't be HASN'T (J stands for H), so let's try WASN'T.

They H*is*ht P*iYe* M*ats an*R RXS*s. He wr*X*te the* K*ren*GK*tia*P, UG*t she* SX*t her* MP*a*G*se int*X *it. The* R*e*Z*i*P *ma*R*e* *me* RX *it. He wasn't a*M*t*G*a*PP*y* K*resent at the time,* UG*t I* Y*n*X*w he was res*KX*nsi*UP*e.*

Other words that pop out at us are WROTE (it can't be WRITE), INTO, PRESENT, and RESPONSIBLE. In addition, the second word on the first line almost certainly has a G as the middle letter (_IGHT).

They Hight li*ye* M*ats an*R R*ogs. He wrote the pren*G*ptial, b*G*t she got her* M*la*G*se into it.*

The R*e*Z*il ma*R*e me* R*o it. He wasn't a*M*t*G*ally present at the time, b*G*t I* Y*now he was responsible.*

G must stand for U, making B_T into BUT. Y must stand for K, making KNOW and LIKE. The three words at the end of the first sentence have the pattern: _ATS AN_ _OGS. That should remind you of CATS AND DOGS. Finally, we guess the last two unknown letters.

They fight like cats and dogs. He wrote the prenuptial, but she got her clause into it.

The devil made me do it. He wasn't actually present at the time, but I know he was responsible.

```
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
- W - S T R U F E H P Y C - I L - D G A B N M O K V
```

79. Two One-Liners Three – Answer

We've seen it several times now: a three-letter word after a comma in the middle of a sentence is usually BUT. X and R are one-letter words, probably A and I or I and A. If BUT is right, R is more likely to stand for I than A. We know this from the first word in the first line. Let's see if these assignments make sense.

N*itti*FO *t*NM *b*BBTU *i*U K*i*FM, *but* UBBFMS BS I*at*MS *a* VBIIMOM U*tu*ZMF*t* Y*i*II ESB*bab*IG N*a*CM *t*B SM*a*Z *t*NMD.
I Y*a*U EI*a*G*i*FO N*i*ON-U*ta*TMU E*a*EMS-U*t*BFM-*a*FZ-UV*i*UUBSU - D*a*T*i*FO DBFMG N*a*FZ BCMS K*i*U*t*.

M is a frequent letter, especially at the end of words. If M stands for E, the second word in the first line is probably THE. If this is true, the first word is almost certainly HITTING. Let's see how these substitutions work.

*Hitting the b*BBTU *i*U K*ine, but* UBB*ne*S BS I*ate*S *a* VBII*ege* U*tu*Z*ent* Y*i*II ESB*bab*IG *ha*C*e t*B S*ea*Z *the*D.

I ʏaU EIaɢing high-UtaTeU EaEes-UtBne-anz-UViUUBSU - DaTing DBneɢ hanz BCes KiUt.

JB has the pattern T_, so B stands for O. HAN_ and AN_ end with the same letter, undoubtedly D. The two-letter word I_ could be IF or IS, not IN or IT. Because the unknown letter appears at the end of other words, let's guess IS.

*Hitting the booᴛs is ᴋine, but soones os Iates a VoIIege student ʏiII ESobabIɢ haCe to sead theᴅ.
I ʏas EIaɢing high-staTes EaEes-stone-and-sVissoss - DaTing Doneɢ hand oCes Kist.*

In the first line there is a phrase: SOONE_ O_ _ATE_, where the final letter is the same in all three words. It must be SOONER OR LATER. The word before STUDENT follows the pattern _O_ _EGE; it is COLLEGE. We're getting close to a solution.

*Hitting the booᴛs is ᴋine, but sooner or later a college student ʏill Erobabiɢ haCe to read theᴅ.
I ʏas EIaɢing high-staTes EaEer-stone-and-scissors - DaTing Doneɢ hand oCer Kist.*

The words that come to mind now are BOOKS, WILL, HAVE, THEM, and OVER. The hyphenated phase is surely PAPER-STONE-AND-SCISSORS.

*Hitting the books is ᴋine, but sooner or later a college student will probablɢ have to read them.
I was plaɢing high-stakes paper-stone-and-scissors - making moneɢ hand over ᴋist.*

The G stands for Y (PLAYING, MONEY). The K stands for F (FINE, FIST). The final answer is:

Hitting the books is fine, but sooner or later a college student will probably have to read them.

I was playing high-stakes paper-stone-and-scissors - making money hand over fist.

```
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
- O V M P N Y B L T F - E H G - U I R K S C - A W D
```

80. <u>Roots – Answer</u>

1. Cephal(o) = head; dyad = two; ess = to be; melior = better; hen(o) = one; capit = head. Two heads are better than one.
2. Non = not; plor(e) = cry; hyper = over; galactic = milk. Don't cry over upset (spilt) milk.
3. Plut(o) = wealth; latry = worship; rhiz = root; omni = all; cac(e) = bad; Worship of wealth is the root of all evil.
4. Mono = one; ornith = bird; im = in; manu(al) = hand; ess(e) = to be; par(e) = equal; di = two; avi(an) = bird; en = in; shrub = bush. One bird in hand is equal to two birds in bushes.

81. <u>Bring Home the Bacon - Answer</u>

All this talk about Bacon has got to suggest that this is a Baconian cipher. Bacon used a five-character binary (ones and zeros) method to represent each letter. He used five zeros to represent the letter A, four zeros and a one to represent B, etc. In this puzzle zeros are represented by cans; ones are represented by boxes.

00000 = a	00101 = f	01010 = l	01111 = q	10100 = w
00001 = b	00110 = g	01011 = m	10000 = r	10101 = x
00010 = c	00111 = h	01100 = n	10001 = s	10110 = y
00011 = d	01000 = i-j	01101 = o	10010 = t	10111 = z
00100 = e	01001 = k	01110 = p	10011 = u-v	

This follows Francis Bacon's original mapping of letters (including combining letters in two cases). The first set of five items (upper left shelf) is can-box-can-box-can (01010). This translates to L. In a similar way each letter can be determined.

The deciphered message is:

LOOKINTHEREFRIGERATEDMEATSECTION

And we can put in the proper spacing to read:

Look in the refrigerated meat section.

82. <u>Inflated Bill (Or Is It George?) - Answer</u>

The blow-up of George Washington is not a perfect inflation of a dollar bill. A question runs from temple to temple across his forehead. It is written in Morse Code (International Code to be precise). The

dots and dashes ask which president's picture appears on a ten dollar bill? A useless hint then follows: "It ain't Washington!"

The person pictured on a saw-buck is Alexander Hamilton, but he was never President (of the United States, at least). So, if you said that there was no correct answer – give yourself ten silver dollars!

83. <u>Amplitude Modulation - Answer</u>

The first thing for you to recognize about this puzzle is that the graph represents letters. One way to guess this is to count about twenty-six marks on the vertical axis – one for each letter in the alphabet. Then, reading the graph from left to right, you get the alphabet position for each letter in the message. The deciphered line reads, "First last letter each word." With a little imagination you can see the point.

If you read only the first and last letters of each word in the text below the graph, you find the real question. The message decodes to:

> EACHDAYATNINEFIFTYAMINSPARTANBURGSCA
> FOURLETTERWORDMAKESWAVESWHATISTHISWORD

Now you must divide and punctuate the question properly – no easy job! It becomes:

> Each day at nine fifty AM in Spartanburg SC, a
> four-letter word makes waves. What is this WORD?

The key to this problem is the meaning of "AM." I have supplied that answer in the title of the puzzle. There are two ways to broadcast radio waves: 1) Amplitude Modulation, or AM, and 2) Frequency Modulation, or FM. Spartanburg, South Carolina has a radio station that "makes waves" at 950 kilohertz on the AM band. What are its four call letters?

Next, consult a radio advertisers' guide to stations in the United States (or just look up Spartanburg, SC radio stations in Google). The "spot" guide (notice the hint in the introduction to the puzzle) will tell you that the radio station in question is WORD. It all falls into place, doesn't it? The answer to the question "What is this WORD?" is a *radio station*.

84. <u>Jigsaw Message 1 – Answer</u>

The evil twist to this puzzle is that the message reads downward instead of straight across the page. All you need to do to reveal the message is to switch the pieces that have the same shapes. The

vertical rectangles "TU" and "AI" change places, and the L-shaped pieces change places. The resulting message tells you to make a left turn onto Main Street.

## 85. Jigsaw Message 2 – Answer

This puzzle has two evil twists. The two linear pieces need to be rotated before you reassemble the square. The shorter piece ("OO") is turned 90 degrees. The longer piece ("SNI") is turned upside-down to become "INS." The "L" moves to the upper left-hand corner. The "K" goes to the upper right-hand corner. The "OO" takes the center of the top line. The other pieces fit together and tell us to look into coal bins.

86. Jigsaw Message 3 – Answer

English doesn't have a common four-letter word that contains "YW." It certainly doesn't have one that can be formed with the pieces given. Instead, let the "Y" be the last letter of one word and "W" be the first letter of another. This means the solution won't be a square. We try several words starting with "W", but only 'with' seems to work. The word below 'with' has the pattern G _ _ D, and 'gold' fits nicely. By turning the "IH" upside-down and combining it with "DE" we get 'hide.' That leaves 'ruby' as the second word. Our instructions tell us to hide the ruby with the gold. We have a 'shape' outside the 'box.'

84.

T	L	O	M
U	E	N	A
R	F	T	I
N	T	O	N

85.

L	O	O	K
I	N	T	O
C	O	A	L
B	I	N	S

86.

H	I	D	E

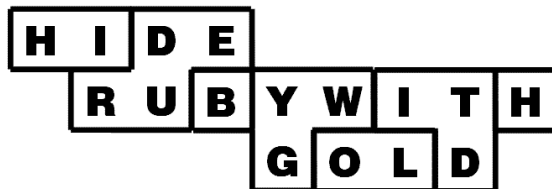| R	U	B	Y	W	I	T	H

G	O	L	D
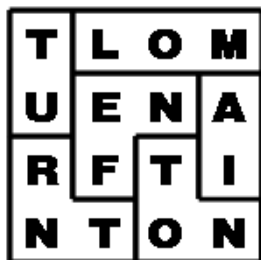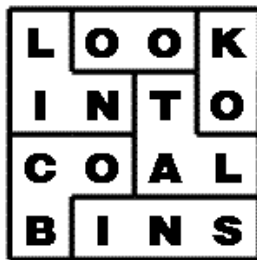
Answers

Chapter 5 – Math and Science Puzzles

87. Back to Square One – Answer

The answer is explained in the chapter text.

88. Line Dancing - Answer

The answer is explained in the chapter text.

89. The Five Little Pigs –Answer

The five enclosed areas don't have to be the same size; they only need to be separate. Place the new square diagonally inside the larger square. The result is four triangular areas and one square area. Each pig (represented by a star) has its own private enclosure.
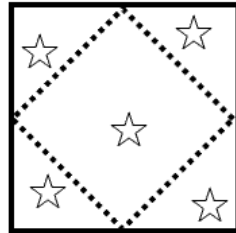
90. Circular Logic - Answer

We could use the Pythagorean theorem to calculate the length of the rectangle's diagonal, but we don't know the length of OA. We know the rectangle is inscribed in a circle, so we could use trigonometry tables to calculate OA as 6.245. The diagonal AB = the square root of (5 squared + 6.245 squared). Instead, we should recognize that both diagonals of a rectangle are the same length. The other diagonal is obviously a radius of the circle. Therefore, the length of AB is 8. The "aha" moment turns a *problem* into a puzzle.

91. Cut the Chain - Answer

You need to cut two links (at positions 4 and 11). This leaves lengths of 3, 6, and 12.
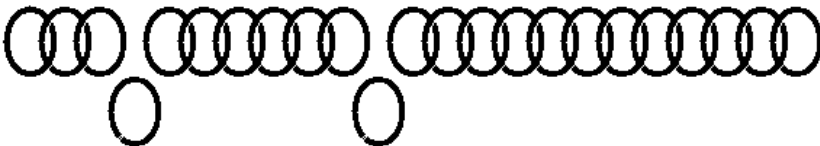
For example, if you wanted to pay 8 links, you could give the 6-link chain plus the 2 broken links. If you need to pay 15 links, you could use the 12-link chain and the 3-link chain.

Here is an added challenge: How long a chain could you start with if you were allowed to cut three rings? Hint: It is much longer than 23.

92. Sonic vs Shadow - Answer

The light source is the Sun. Its rays are, for all practical purposes, parallel because it is so far away (93 million miles). Therefore, the shadow cast by the plane is the same as the shadow cast when the plane is on the ground. 231 feet is the answer.

93. pHoneyMoons – Answer

Crescent moon: The position of the stars is the problem. The star inside the arc of the crescent moon would never be visible. The moon is actually a full circle; it only appears to be a sliver because most of the moon is in shadow. The star can't be in front of the moon.

Half moon: A half moon can't have its dark half angled down toward the horizon. That would mean that the sun is high in the sky, which would never happen at night. A full moon halfway into an eclipse might have its dark side near the horizon, but the shadow would be curved like it is in the shooting star picture.

Shooting star: A shooting star (meteor) is caused by an object burning up in the earth's atmosphere. This phenomenon is much closer than the moon. It would never appear to be going behind the moon.

Big Dipper: There are two reasons why this couldn't happen; both require some knowledge of the Big Dipper constellation. First, the moon is drawn much too large compared with the constellation of stars. Second, the moon would never appear that far north. The moon and planets move in a range (called 'the ecliptic') near the celestial equator. The Big Dipper is much farther north, near the North Star.

94. Mean Speed - Answer

Explained in the chapter text.

95. 5 × 5 × 5 - Answer

Explained in the chapter text.

96. Matchstick Math 1 - Answer

Explained in the chapter text.

97. <u>Carpet Cut - Answer</u>

The diagonal lines might lead us to think that the answer involves a diagonal cut, but one straight diagonal cut won't work. We're going to have to cut at right angles if we expect to put the pieces back together properly. What if we try cutting off one third of the length and stacking it on top of the remaining two thirds? That's clearly wrong; we'd have to cut the smaller piece into two blocks to make that work.

Sometimes a wrong answer can give us some insight into a workable solution. What if we made a vertical cut two thirds of the way across the width but stopped cutting when we got to the middle? Then we could change the direction of our cutting and go horizontally across that center oval. Finally, we change to the vertical direction again and cut downward to form a stair-step pattern. We now have two pieces: one L-shaped and the other shaped like a 7.

Oh no! If we raise the "7" and put it on top of the "L," the diagonal lines don't match properly. To salvage this solution we need to cut our stair-step pattern from the other side. If we cut a " ⌐" and a "⌐" instead of an "L" and a "7," the patterns of the two pieces line up when we put them together as a square.
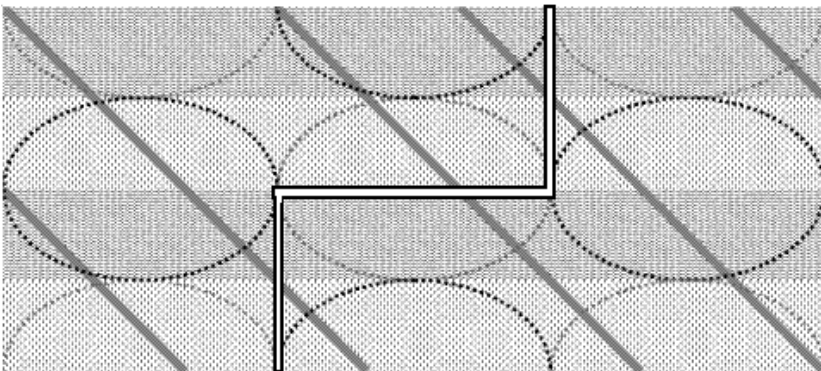
98. <u>The Germ of Truth - Answer</u>

Dr. Von Brain covers the dish containing germ A with **both** shower caps nested into each other. When that incubation is done, he has one cap contaminated with A on one side and clean on the other. He also has another cap that is contaminated with A, B, and C (from the oven) on one side and clean on the other side. He turns the first cap inside-

out to cover the B germ with a clean surface. He uses the second cap to cover the C germ with a clean surface. Mission accomplished!

A, B, & C   **A, B, & C**

A

A

A
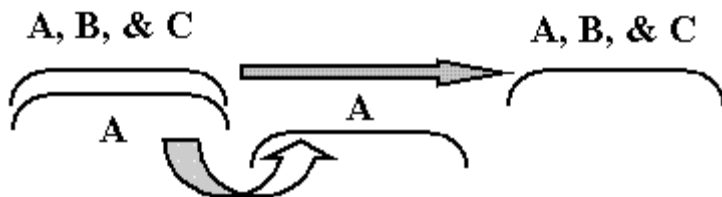
99. <u>Matchstick Math 2 - Answer</u>

1. LXII = X / V → L / II = XXV; move the "\" from the first "X" to cross the division sign ("/") on the right [swapping the X and /]
2. XII = III – II → I × I = III – II; move the first "I" to the left of the "X"; then look at "X" as "×" instead of "10"
3. LXXIII = IX + X → LX/III = IX + XI; move the "\" from the second "X"; rotate it and make the last "X" into "XI"
4. L + XXI = VI → L + XXI = 71; move the left side of the "V" up and rotate it so the "–" and the "/I" look like an Arabic "71"

100. <u>Water Marks – Answer</u>

Part 1 – I was able to mark the cans in 10 moves. Did you do better?
Fill the 7-liter can from the faucet.
Fill the 3-liter can from the 7-liter can. Mark "4" on the 7-liter.
        Discard water from 3-liter can (doesn't count as a move)
Fill the 3-liter can from the 7-liter can. Mark "1" on the 7-liter.
        Discard water from 3-liter can (doesn't count as a move)
Pour from the 7-liter can to 3-liter can. Mark "1" on the 3-liter.
        Discard water from 3-liter can (doesn't count as a move)
Fill the 7-liter can from the faucet.
Fill 3-liter can to its "1" mark from 7-liter. Mark "6" on the 7-liter.
        Discard water from 3-liter can (doesn't count as a move)
Fill 3-liter can to its "1" mark from 7-liter. Mark "5" on the 7-liter.
Fill the 3-liter can from the 7-liter can. Mark "3" on the 7-liter.
        Discard water from 3-liter can (doesn't count as a move)
Fill 3-liter can to its "1" mark from 7-liter. Mark "2" on the 7-liter.
        Discard water from 3-liter can (doesn't count as a move)
Pour from the 7-liter can to 3-liter can. Mark "2" on the 3-liter.

Part 2 – I lost only 3 liters while marking the cans. Did you do better?
Fill the 3-liter can from the faucet.
Pour from the 3-liter can to 7-liter can. Mark "3" on the 7-liter.

Fill the 3-liter can from the faucet.
Pour from the 3-liter can to 7-liter can. Mark "6" on the 7-liter.
Top off the 7-liter can from the faucet.
Fill the 3-liter can from the 7-liter can. Mark "4" on the 7-liter.
Fill 7-liter can to its "6" mark from 3-liter. Mark "1" on the 3-liter.
          Discard the 1 liter from 3-liter can (1 liter lost so far)
Fill 3-liter can to its "1" mark from 7-liter. Mark "5" on the 7-liter.
          Discard the 1 liter from 3-liter can (2 liters lost so far)
Fill the 3-liter can from the 7-liter can. Mark "2" on the 7-liter.
Fill 7-liter can to its "3" mark from 3-liter. Mark "2" on the 3-liter.
Fill 7-liter can to its "4" mark from 3-liter.
          Discard the 1 liter from 3-liter can (3 liters lost so far)
Fill the 3-liter can from the 7-liter can. Mark "1" on the 7-liter.

101. <u>Murphy Goldberg - Answer</u>

The ball will roll down the plank, but there is no reason for it to turn and fall into the bucket. One way to fix this is to build barriers that restrict the ball to the desired path. There are other ways, too. When the rope lifts the hook and lets the wheel turn, the wheel will stop turning after half a turn. The dowel that the hook was holding will hit the rope and stop the wheel from turning. Not enough rope will unwind to close the switch. Cut off most of the dowel and wind the rope closer to the end of the center dowel.

The batteries aren't installed in the case, so no electricity will get to the motor. Properly install the batteries. When the motor reels in the cord and pulls the plug from the toilet tank, the water will spout up – but not high enough to reach the sponge. You'll need to raise the tank or lower the sponge, or both. Also be sure that the cork in the boat is almost ready to fall out, or the increased weight in the sponge won't be enough to remove the cork.

When the boat sinks and takes the weights with it, the water level in the cylinder will drop, not rise. The boat is displacing water equal to the weight of the steel. When steel falls into the water, it displaces a smaller volume, and the level of the water drops. You could install a switch that turns on when the water level drops. Fountains and ponds sometimes have such switches to add water when levels drop.

At Number 5, the batteries are installed but turned sideways. Again no electricity will reach the motor. Install the batteries correctly. When the motor tries to turn the first gear, it will fail. The small gear above the first gear will try to turn clockwise, but so will the larger

gear to the right. All three gears will lock up and fail to turn. Remove the smaller gear, and it should work. The gears and pulleys will release the hook.

The pitcher won't hold 3 gallons of water because the spout's opening is too low. You can pour 3 gallons into the pitcher, but half of it will pour out the spout, even with the pitcher on level ground. When you tip this pitcher, some of the water will stay in the bottom, too. Get a pitcher that is more like a coffee urn, with a spigot at the very bottom. Release the spigot when you are ready to fill the empty cylinder.

The last set of batteries are finally installed correctly, but one of the wires isn't attached to the motor. Even when the motor is turned on, it won't turn very far. The four-bar mechanism that "waves the flag" won't let the wheel turn. The bars on the left and top have a combined length that is longer than the other two bars. This means that the mechanism will lock up after less than a quarter turn. Remove the four-bar or fix it to have the same proportions as the illustration in the chapter text.

I'm sorry to report this, but if the mice were locked in a hermetically sealed box, they suffocated a while ago. Be sure you have air holes so our little buddies can breathe.

102. <u>Our Product Makes the Difference – Answer</u>

Since the numbers must be different, we can't set both equal to zero. If both numbers are positive integers (like 1 and 2), the product will always be greater than the difference. If there is an answer, it looks like we'll have to use negative numbers. If both x and y are negative, the result is always the same as if they were both positive. Suppose x is negative and y is positive. The equation is basically equivalent to positive integers where $x \times y = x + y$.

Unfortunately, there is only one case where positive integers make the equation true: $x = 2$ and $y = 2$. But the two numbers can't be the same. Wait! The numbers aren't the same. We made x a negative number and left y a positive number. The solution is $x = -2$ and $y = 2$.

103. <u>Thirty "Four Fives" – Answer</u>

In addition to the four basic operators (+, -, ×, and /), here are some techniques I needed to use:
Combine two 5's into 55.
Use a decimal point to form .5 or 5.5.
Use a factorial sign to form 5! This means $5 \times 4 \times 3 \times 2 \times 1$, or 120.

Num	Formula	Num	Formula

Num Formula

1. 55 / 55
2. (5 / 5) + (5 / 5)
3. (5 + 5 + 5) / 5
4. ((5 × 5) - 5) / 5
5. 5 + (5 × (5 - 5))
6. ((5 × 5) + 5) / 5
7. 5 + ((5 + 5) / 5)
8. (5 − (5 / 5)) / .5
9. 5 + 5 - (5 / 5)
10. (55 - 5) / 5
11. 5 + 5 + (5 / 5)
12. (55 + 5) / 5
13. .5 + (.5 × 5 × 5)
14. 5 + (5 - .5) / .5
15. (5 × 5) - (5 + 5)
16. (55 / 5) + 5

Num Formula

17. (5! / (5 + 5)) + 5
   5! = 5 factorial =
   5 × 4 × 3 × 2 × 1 = 120
18. ((5 - .5) / .5) / .5
19. (5 + 5 - .5) / .5
20. 5 + 5 + 5 + 5
21. (5.5 + 5) / .5
22. (55 / 5) / .5
23. .5 + ((5 - .5) × 5)
24. (5 × 5) - (5 / 5)
25. 5 × 5 + (5 - 5)
26. (5 × 5) + (5 / 5)
27. (5.5 × 5) - .5
28. (5.5 × 5) + .5
29. (5! + (5 × 5)) / 5
30. (5 + 5 + 5) / .5

Many other answers are possible.

104. **Balance of Flour - Answer**

To understand the following chart, here are a couple of examples explained:

- To measure 1 kg, I start by balancing the 2 kg weight against 2 kg of flour. I use w1 (weigh 1) to represent the 2 kg of flour.
  Then I split the 2 kg of flour between the two pans until there is a balance of 1 kg on each side (w2 represents 1 kg of flour).
  I use one of the w2 weights as my 1 kg sample (the answer).
- To measure 3 kg, I put the 5 kg weight on one side and the 2 kg weight + 3 kg of flour (w1) on the other side. We use w1 as our 3 kg sample.
- To measure 22 kg, I split the full 50 kg bag into two pans of 25 kg (w1). Then I put the 5 kg weight in one pan and the 2 kg weight in the other pan and remove flour from the first pan until both sides balance at 27 kg. The 22 kg in the first pan is our answer.

- To measure 24 kg, I put the 2kg weight in the first pan and then split the full 50 kg bag among the two pans until they balance. There will be 24 kg of flour in the first pan.
- To measure any weight from 26 to 50, simply measure the flour for 50 minus the desired weight and use the leftover flour as your answer. For example, to get 40 kg, measure 10 kg and use all of the flour except the 10 kg.

```
 #        First           Second
kg     Weighing          Weighing        Answer
--    ----   ----       ------   ----     ----
 1    2        w1       w2=split w1       w2
 2    2        w1                         w1
 3    5      2+w1                         w1
 4    2        w1       2+w1     w2       w2
 5    5        w1                         w1
 6    5      2+w1       w1       w2       w1+w2
 7    5+2     w1                          w1
 8    5        w1       5+w1     2+w2     w2
 9    5+2     w1       2+w1     w2       w2
10    5        w1       5+w1     w2       w2
11    2        w1       2+5+w1   w2       w1+w2
12    5        w1       5+2      w2       w1+w2
13    5        w1       5+w1     2+w2     w1+w2
14    5+2     w1       5+2+w1   w2       w2
15    5        w1       5+w1     w2       w1+w2
16    5+2     w1       2+w1     w2       w1+w2
17    5        w1       5+2+w1   w2       w1+w2
18    w1=split 50       5+2+w2   w1       w2
19    5+2     w1       5+w1     w2       w1+w2
20    w1=split 50       5+w2     w1       w2
21    5+2     w1       5+2+w1   w2       w1+w2
22    w1=split 50       5+w2     2+w1     w2
23    w1=split 50       w2+2     w1       w2
24    2+w1   w2, where w1+w2= 50          w1
25    w1=split 50                         w1
26-50 are just the flour left over from the 50
kg bag in examples 24-1.
```
Other answers are possible.

105. <u>Letter Long Division - Answer</u>

Obviously, C = 1, because C × ABC = ABC.
A, C, D, E, and H are not zero because they begin numbers as the leftmost digit.

In the third multiplication, B × C = B, then B × B = xH (a number that ends in H). B could be any number from 2 through 9. B × B could equal 4, 9, 16, 25, 36, 49, 64, 81. Therefore H = 4, 5, 6, or 9

>If H = 4, B = 2 or 8   If H = 6, B = 4 or 6
>If H = 5, B = 5   If H = 9, B = 3 or 7

H can't equal B, so we can eliminate a couple of cases.

>If H = 4, B = 2 or 8   If H = 9, B = 3 or 7
>If H = 6, B = 4

In the second subtraction (HIG − ABC = ECH), the smallest value that H can be is 5 (if A and E are 2 and 3). Therefore we can eliminate the cases where H = 4.

In the first subtraction (DEF − ABC = HI), notice that we are borrowing 1 from D to add ten to E (or E − 1 if we are borrowing from E).

If H = 6 and B = 4, then E = 0 or 1. Both are impossible as we saw earlier. Therefore, H = 9.

In the last subtraction, G − 1 = 9. We must borrow from I, and G = 0. Here's where we are so far:

```
          11B
        ------
  AB1 ) DEF0B
         AB1
         ---
          9I0
          AB1
          ---
          E19B
          E19B
```

In the second subtraction, (I – 1) – B = 1. We know from before that B = 3 or 7. If B = 7, then I = 9. But that can't be, because H = 9. Therefore, B = 3 and I = 5.

```
           113
        ------
   A31 ) DEF03
         A31
         ---
         950
         A31
         ---
         E193
         E193
```

The first subtraction shows us F = 6 and E = 2. That means A = 7 because 9 – A = 2.

We have to borrow from D in the first subtraction, so D = A + 1 = 8.

```
           113
        ------
   731 ) 82603
         731
         ---
         950
         731
         ---
         2193
         2193
```

106. <u>Say When - Answer</u>

The 18th century is the 1700's. What is the first year of a century? The first century started in year 1, not year 0. The 18th century started in 1701, not 1700. Now we know the year. What was New Year's Day?

England converted from the Julian calendar to the Gregorian calendar in 1752. Before that, England began its new year on March 25. When the calendar was changed in England, the Julian calendar was eleven days behind the actual solar year. So the day after September 2, 1752, was September 14, 1752. Therefore, March 25, 1701, fell on a Tuesday.

Answers

Chapter 6 – Crosswords

107. <u>Woven Words – Answer</u>

The method for solving the puzzle is explained in the chapter text. Here is the completed grid.

T	A	B	L	E		S	A	S	H	
U			A				I		Y	E	S
R	A	T	S			L			D		A
R			T	O	O	T	H		R		L
E				N				T	A	R	T
T	R	E	S	S		S					E
	A			E		U	N	T	O	L	D
	T	I	L	T	E	D			O	
	I		A			D		R	O	U	T
R	O	A	S	T		E	R	A			O
A			E			N		I			U
Y	E	A	R	N			A	L	T	A	R

108. <u>Star Crossed – Answer</u>
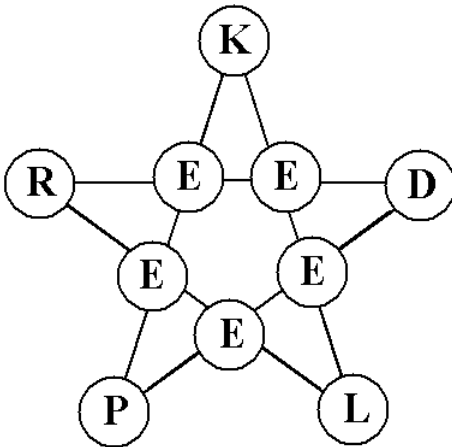
109. <u>Word Square – Answer</u>

R	E	P	L	Y
I	G	L	O	O
F	R	A	U	D
T	E	N	S	E
S	T	E	E	L

110. <u>Musical Medleys – Answer</u>

Theme entries combine names of two Broadway musicals.

```
A T O M   G R A S P   S L E D
L O P E   A O R T A   C O Z Y
T O A D   L A P E L   A C R E
O K L A H O M A M M A M I A
    L A P S     E S P
Q U E L L S   B A T S   C P A
U N T I E   T I N T   S H I N
A C H O R U S L I O N K I N G
C L A N   N A G S   A I D E S
K E N   W E R E   R I P E S T
      S O D     C O A L
    T H E K I N G A N D A I D A
E R I E   B E A R D   N O I R
G I L D   L E N T O   E W E S
O P T S   E D G E S   S A T E
```

111. <u>11 × 11 Diagramless – Answer</u>

```
  B A B E   T E A M
A R D O R   R A B A T
C A D R E   E R A S E
E V E R   W A N T O N
  E R O D E D   E N D
      W E A L D
C P A   F R E E Z E
A U G U R Y   T E L L
S P I R O   C A B L E
K I L N S   A I R E D
  L E S T   P L A N
```

112. <u>Carousel – Answer</u>

O	R	G	A	N		H	A	R	P		B	O	T	H
P	I	A	N	O		O	B	O	E		O	H	I	O
E	D	I	T	S		M	E	T	R	O	N	O	M	E
N	E	T		E	Y	E	D			U	S	H	E	R
		W	O	E	S		A	L	T	A				
R	A	D	I	U	S		O	C	A	R	I	N	A	S
I	N	E	R	T		A	R	U	D	E		E	M	U
S	T	A	Y		S	L	A	T	S		L	I	A	R
K	I	T		T	I	T	L	E		B	U	G	L	E
S	C	H	E	R	Z	O	S		L	A	T	H	E	R
		C	U	E	S		R	I	S	E				
A	B	O	H	M		O	E	D	S		E	F	F
S	A	X	O	P	H	O	N	E		O	P	E	R	A
K	N	E	E		U	S	E	D		O	I	L	E	D
S	E	N	D		B	A	S	S		N	E	S	T	S

113. <u>Happy Holidays – Answer</u>

Across

1. VEHICLES (HIC in ELVES anagram = *sleighs, for example*)
5. STAR (*heavenly sign* hidden in 'chri<u>ST AR</u>rival')
9. MENORAH (*Hanukkah icon* in 'a<u>MEN OR A H</u>allelujah')
10. EMITS (last part of (*ultimate*) christma<u>STIME</u> reversed (*review*))
11. NURSING HOMES (anagram of HIS GNOMES RUN makes *places for elderly care*)
13. STORMY (*rolling toys* = STOY holding RM (for room) means *like winter weather*)
15. NEEDLE (NEED (*require*) + LE (*the French*) = Xmas tree part)
17. OVERSTOCKING (*stuffing too much stuff* formed by OVER (*done*) + STOCKING (*Xmas 'stuffer'*))
20. SANTA (STA *has* AN) makes *icon of Christmas*)
21. MANAGER (MANGER (*Nativity scene*) has A forming *director*)
22. DECK (DEC (*holiday month*) + K (*Kwanzaa initially*) = *cards*)
23. CROSSTIE (CROSS (*angry*) + TIE (*gift for dad*) = *railroad building block*)

Down
1. VAMP (VAM (*5 AM*) + P (*Present's opening*) forms *seductress*)
2. HINDU (*religious follower* hidden in 'josepH IN DUtiful')
3. CHRISTMAS DAY (anagram of ADS HARM CITYS; answer means *yule*)
4. ETHANE (*gas for heating* hidden in 'morE THAN Ever')
6. TRIMMED (TRIED *about* MM (2000) = *decorated Xmas trees*)
7. RESISTED (wrap IS in RESTED (*took a nap*) and get *held off*)
8. WE THREE KINGS (WET + REEKING (*stinking*) in HS (*high school*) is a *carol*)
12. ESPOUSED (ESP (*supernatural power*) + O (*endless jOy*) + USED = *took on*)
14. OCEANIC (anagram COCAINE to form *living in the open sea*)
16. FORMER (*ex* hidden in 'elF OR MERrymaker')
18. NIGHT (homophone of knight (*damsel's champion*) is last word in Silent NIGHT)
19. TREE (*evergreen* = first letters of 'The Reindeer Eat Entire')

114. Triviacrostic – Answer

A. SWAN	H. NORTHWEST	O. EIGHTH
B. ELIZABETH	I. DUTCH	P. LUSH
C. NORFOLK	J. IDOLS	Q. ANT FARM
D. ONSHORE	K. ETHER	R. VANISH
E. RHIZOME	L. GOBS	S. ETCH
F. DAMS	M. ONSTAR	T. GABOR
G. OZZIE	N. DOWN TO	U. AFTER

The quotation is the introductory theme from the 1950's Disney TV series ***Zorro*** starring Guy Williams. "Out of the night when the full moon is bright, comes the horseman known as Zorro. This bold renegade craves a 'Z' with his blade, a 'Z' that stands for Zorro." The acrostic formed by the first letters: "Senor Don Diego De La Vega."

115. Large Diagramless – Answer

1 Across begins in the eleventh square on the top row.

Brain Trainer

```
                        M A L I
A B C     L Y N X   A M E N D
R U L E   Y O U R   R A F F I A
C R U X   I N C A     T O N N E
  R E I G N   L Y E     A T E
    L O G   E E L S   D P H I L
A S S E T   A D M I R A L
C P A     F U R     R E V U E S
E A S T E R N     U L Y S S E S
  S H A D O W   S P Y   P E T
    R E G E N C Y   T H Y M E
M O R O N   D A H L   G U Y
A D O     P I P   A G I L E
Y O U N G   C H U M   N E A R
  R E A L L Y   H I F I   G A V E
    S P A T E   I C O N   D E B
    E D D A
```

116. <u>Carpe Diem – Answer</u>

```
S H A D E S R E S I N S
T A M I S T E A K S U H
O P O S S U M D I O D E
O E K B A L I B E L E R
P A P A Y A S I R A S B
S T A R S H S T A T T E
A Y E S O U L E D E F T
S E N I O N Y I E C R U
E B S E Z G A M B L E R
P U N N E R S P U S E G
T R A S H I R O N O R E
I R R E A L M S K L A N
C O L D L Y R E S O R T
```

To make the answers fit into the grid remove the three-letter day-of-the-week abbreviations (Mon, Tue, Wed, etc.) whenever they occur.

Across

1. SHADES [Suffer + HADES]
5. RESINS [RE-SINS coined word]
10. TSUNAMI [I M(AN)UST, full reversal] - SUNday
11. STEAKS [STAKES homophone]
12. OPOSSUM [SOSO UMP anag.]
14. DIODE [DI(O)D + E]
15. LIBELER [IntoLERaBLE - NATO anagram]
17. PAPAYAS [PAPA + SAY reversal]
18. STAR [RATS reversal]
20. STATUETTE [STATU(ET)TE] - TUEsday
21. AYE [hidden]
23. SOULED [OLD SUE anagram]
26. EFT [lEFT - L]
28. SENSATION [AS TENSION anagram] - SATurday
30. ECRU [hidden]
34. GAMBLER [GAM(Beginner's + Luck)ER]
35. PUNNERS [PENS RUN anag.]
37. TRASH [To + RASH]
38. IRON ORE [IRON HORSE - S,H]
39. REALMS [REAL + MS]
40. KLAN [hidden]
41. COLDLY [CLOD anagram +LaYs odd letters]
42. RESORT [RES(OR)T]

Down

1. STOOPS [STO(Official)PS]
2. AMOK [AM + OK]
3. DISBARS [IDS anagram + BARS]
4. ESSAYS [E + S + SAYS]
5. REMISSLY [RE(MISS)LY]
6. FRISKIER [RISK in FIRE anagram] - FRIday
7. ISOLATE [LIES TO A anagram]
8. NUDES [DUNES anagram]
9. SHERBET [S(HERB)ET]
13. PEATY [hidden]
16. BITE [I BET anagram]
19. HUNGRILY [HURLING anagram + Y]
21. ASEPTIC [AS + EP(T)IC]
22. ENSNARL [hENS + RAN reversal + L]
24. OOZE [bOOZE]
25. DEBUNKS [DEB + hUNKS]
27. FREER [FREE + R]
29. IMPOSE [IMPOSsible + excisE]
31. URGENT [hidden]
32. BURROWED [BURR + OWED] - WEDnesday
33. ENTHUSED [THEN anagram + USED] - THUrsday
36. SOLOMON [SOL + MOON anagram] - MONday

117. <u>Picture Clues – Answer</u>

Here is how each rebus forms an answer:

Across

1. LIPS reversal + T
6. PAN + Z
11. Y + NOSE
12. A gap E
13. UP ACE
14. MACE + SAWS
15. MAN + NIL + A
17. n + EIGHT
18. ISLE
19. I + SICKLES
21. CORE + KNEE
22. FAN + AT + TIC
25. L less D
28. a + PAWN
29. DELETE
31. SPIKE A
33. NEV + ER
34. L's + z
35. SUN + EAR
36. C + rz
37. EAR LYE – E

Down

1. SWAMI
2. PEEP + L
3. IN + A + n
4. low PSI
5. TEE + S + L + E + ought
6. MAP reversal
7. H + N + C
8. NAYS + AWL
9. SP + EIGHT
10. Y + ESE + S
16. ARC - R + GRID - G
20. IN CENTS
21. CANCER (Astrol.)
22. F + U's + z
23. APPLE
24. NO I's
25. LEVER
26. Iron + Carbon = STEEL
27. DAIRY
30. LEAN A
32. S

Cryptic clues:

Across

1. SPILT [SPLIT anag.]
6. PANSY {PANS+Y]
11. WINOS [WIN+SO reversal]
12. AGAPE [AG+APE]
13. APACE [A+PACE]
14. MESAS [hidden]
15. MANILA [ANIMAL anag.]
17. NATE [hidden]
18. ILE [¾ MILE]
19. ICICLES [I+SICKLES homophone]
21. CORNY [CRY NO anag.]
22. FANATIC [IN FACT A anag.]
25. LSD [L+S+D]
28. UPON [hidden]
29. DELETE [DE+LET+E]
31. SPICA [ASPIC anag.]
33. NEVER [NERVE anag.]
34. ELSES [hidden]
35. SNEER [S(N)EER]
36. SEERS [S(E'ER)S]
37. EARLY [A LYRE anag.]

S	P	I	L	T		P	A	N	S	Y
W	I	N	O	S		A	G	A	P	E
A	P	A	C	E		M	E	S	A	S
M	A	N	I	L	A		N	A	T	E
I	L	E		I	C	I	C	L	E	S
		C	O	R	N	Y				
F	A	N	A	T	I	C		L	S	D
U	P	O	N		D	E	L	E	T	E
S	P	I	C	A		N	E	V	E	R
E	L	S	E	S		S	N	E	E	R
S	E	E	R	S		E	A	R	L	Y

Down

1. SWAMI [SWAM+I]
2. PIPAL [PEOPLE homophone]
3. INANE [NINE A anag.]
4. LOCI [COIL anag.]
5. T S ELIOT [TOILETS anag.]
6. PAM [MAP reversl]
7. AGENCY [hidden]
8. NASAL [hidden]
9. SPATE [TAPES anag.]
10. YESES [hidden]
16. ACRID [CAR anag.+ID]
20. INCENSE [IN+SCENE anagram]
21. CANCER [2 defs.]
22. FUSES [F+USES]
23. APPLE [hidden]
24. NOISE [NO+I+SEe-E]
25. LEVER [cLEVER-C]
26. STEEL [STEAL homophone]
27. DERRY [DAIRY homophone]
30. LENA [NEAL anag.]
32. ASS [clASS-40%]

Answers

Chapter 7 – Logical and Lateral Thinking

118. What Are the Odds? - Answer

1. People from Verita and from Mendacia will both say they are from Verita, so the probability is 100%.

2. Oops, sorry, this is a trick question. *You* are at the crossroads, and you are not from Verita, so we know for sure that at least one person is not from Verita. Again, the probability is 100%.

119. Spots Before Your Eyes - Answer

1. Classic answer using logic: If anyone saw two white discs, the person would know immediately that he had a black disc because there are only two white discs. But no one claimed the job immediately, so there are at least two black discs used. If anyone saw one white disc, he would know that he had a black disc because we previously determined that there were at least two black discs. Because no one claimed the job quickly, we know that all three people have a black disc. But how long do you wait for the other people to work out the logic? If they are thinking like you, they may announce first. If they aren't thinking like you, your logic is flawed.

2. Non-standard solution: You should know that you will be given a black disc as soon as the problem is stated. All three candidates must get the same color, or the competition isn't fair. Only by giving each candidate a black disc can the challenges be equal for all candidates. Making an unfair competition would defeat the purpose of the test and would open the manager to a discrimination law suit.

120. X Stream - Answer

- The Classic Logic Answer:

1. Farmer leaves fox and grain on bank A and rows duck to bank B.
2. Farmer leaves duck on bank B and rows back to bank A.
3. Farmer leaves grain on bank A and rows fox to bank B.
4. Farmer leaves fox on bank B and rows duck back to bank A.
5. Farmer leaves duck on Bank A and rows grain to bank B.
6. Farmer leaves fox and grain on Bank B and rows back to bank A.
7. Farmer rows duck to bank B.

The best score is seven crossings

Symbolically, the classic answer might look like the diagram on the right:

```
F G      D-->
F G      <--      D
  G      F-->      D
  G      <--D      F
D        G-->      F
D        <--      F G
         D-->      F G
```

- Lateral Thinking Answers:

a. Farmers and foxes are natural enemies. Why would a farmer be traveling with a fox? Two scenarios come to mind: 1) the fox was caught in a trap that the farmer set, 2) the fox will become a stole for the farmer's wife. Either way, the farmer doesn't want the fox alive. If he kills the fox now, he removes the fox-duck-together constraint. He can now get all three items across in five crossings.

```
F G      D-->
F G      <--      D
  G      F-->      D
  G      <--      D F
         G-->      D F
```

b. The classic solution implies that the farmer has rope to tether the animals while the farmer is rowing across the stream. If so, why doesn't he tie the fox and duck to different trees and keep them away from their food? This approach results in five crossings, too.

c. Ducks are fine swimmers. If he has the duck swim beside the boat on a tether, he can get the task down to three crossings.

1. Farmer leaves grain on Bank A and rows fox to bank B (while duck swims along side).
2. Farmer leaves fox on Bank B and rows back to bank A (while duck swims along side).
3. Farmer rows grain to bank B (while duck swims along side).

```
G      D,F-->
G      <--D        F
       D,G-->      F
```

d. If the farmer can swim too, he could tow the boat (with the fox and the grain) while the tethered duck swims beside him. This reduces it to one crossing.

e. Each of these solutions has the problem of leaving the boat on the opposite shore (bank B). If it is the farmer's boat, he would probably want it on the shore where he is - no problem. If it is someone else's boat, the owner will probably send the constable after the thief who stole his boat. All things considered, it is safer and easier for the farmer to walk a half a mile north along the shore and cross the stream at the bridge (not mentioned in the problem).

121. <u>Leap Frog - Answer</u>

See the chapter text for a complete explanation.

122. <u>The Neighbor Children - Answer</u>

See the chapter text for a complete explanation.

123. <u>Jealous Husbands - Answer</u>

There are actually a large number of answers, but they all look something like this one. Each married couple is represented by a letter (men in upper case, women in lower case). This solution begins with wives c and d rowing to the far bank and wife d rowing back. After the fifth crossing, husband C drops his wife at the island on his way back to Bank 1. This puzzle would be easy if we didn't have to return the boat, but since we must return it, here is one solution.

```
  Bank 1              Island              Bank 2
 --------            ------              --------
 AaBbC D  -cd------------------>        c d
 AaBbC Dd <------------------d-         c
 AaB C D  -bd------------------>       b c d
 AaBbC D  <------------------b-         c d
 AaBbC D  -CD------------------>       CcDd
 AaBbC    <----C-    c   <----Cc-        Dd
 Aa   C   -Bb------------------>    Bb   Dd
 Aa   Cc  <----c-    b   <-----b-   B    Dd
   a    c  -AC------------------> A B C Dd
   a    c            Bb  <-----B- A   C Dd
   a    c                -Bb----> A BbC Dd
   a    c d <------------------d- A BbC D
        d -ac------------------> AaBbCcD
       Dd <------------------D- AaBbCc
        -Dd------------------> AaBbCcDd
```

Solving this tough puzzle starts when we realize that women are free to move as long as no men are near. So we get two wives to the opposite bank and then send their husbands over together. The island then acts as a safe haven for the wife of the husband returning the boat. Another couple goes across, and the wife returns the boat. But she can't go to the opposite shore, so she stops at the island and the other wife continues to her husband. Now we can get all of the men to bank 2 and slowly bring their wives to join them.

Amazingly, we would only save two crossings (one over, one back) if the husbands were to put aside their jealousy.

124. Sign Language - Answer

If sign 1 is wrong, not even one sign is right. But signs 2 and 4 can't both be wrong at the same time (if 4 is wrong, then 2 must be right). Therefore, sign 1 must be right.

Signs 2 and 4 can't both be right at the same time, either. Therefore, sign 3 must be right (at least one sign is wrong).

If sign 4 is right, then the only sign that is wrong must be 2. But then 2's message would be right, and this is a contradiction. Therefore, sign 4 must be wrong and sign 2 must be right. All signs are right except sign 4.

125. The Carlton Stern Case - Answer

See the chapter text for a complete explanation.

126. Meadow Murder - Answer

See the chapter text for a complete explanation.

127. Crash Course - Answer

Jeff seems to be in control of his vehicle. He's not just a passenger. But the story never says that any of the vehicles are cars, and it never says that the bird lands on the road in front of him. One way to explain the situation is that Jeff is flying in formation with two other planes (maybe barnstorming at a local air show). A bird flies into his flight path on a collision course. Jeff has two directions that the driver of car doesn't have: up and down. If he drops his plane into a quick dive or climbs out of his current path, he could avoid the bird. As usual, give yourself full credit if you had any reasonable answer.

128. Word Equations - Answer

1 W on a U
>   1 wheel on a unicycle

4 S: S, S, A, and W
>   4 seasons: Spring, Summer, Autumn, and Winter

8 P in our S S (N C P)
>   8 planets in our solar system (not counting Pluto)

10 C A in the B of R
>   10 constitutional amendments in the Bill of Rights

13 H in a D of P C
>   13 hearts in a deck of playing cards

30 M in H an H
>   30 minutes in half an hour

32 B S on a C B
>   32 black squares on a checker (or chess) board

1969: F M on the M
>   1969: First man on the moon

129. Grand Opening - Answer

The story about the store opening is totally irrelevant. Just look at the card. This is a series or pattern recognition problem. The first J stands for June. Why? The list of letters stands for the months on an annual calendar: June, July, August, September, etc.

130. Truth or Con Sequences - Answer

1) TWTFS   S (Sunday) – the **first** day of the week.
2) IVXLC   D – Roman numeral for **number** 500
3) ASDFG   H – letters along a **type**writer keyboard's middle row
4) MVEMJS   U (Uranus) – planets in order from the Sun
5) WAJMMAJVHTPTFPB   L (**Honest** Abe Lincoln) – Presidents of the United States
6) CAPATGCLVLS   S (Sagittarius) – **sign**s of the zodiac
7) 8 5 4 9 1 7 6 3 2   0 (Zero) (**nothing**) – digits written in alphabetical order

131. Pairs Fashion - Answer

There may have been several ways to group the ten words into pairs, but we were looking to associate words into these two-word phrases: ice age, rain dance, for sale, sea spray, and use tax.

That same logic won't exactly work for the second set of words. But you can form homophones (sound-alikes) of the five pairs in the first list: eye sage, reigned ants, force ail, cease prey, and you stacks.

132. Drug Dealer Dead - Answer

Jones noticed a few things at the crime scene. Smith immediately asked if it was a drug-related crime. Maybe the neighborhood made him suggest drugs, but Smith (as if to prove his point) pointed out a

bag of cocaine that probably wasn't visible from where he was standing as he entered the room.

Smith indicated that the victim had a mustache even though the body was lying face down in a pool of blood. Smith also said that he didn't know the victim. How did he know about the mustache?

Jones mentioned that neighbors heard shots (plural), but Smith wanted a ballistics report on the bullet (singular). He said this before the autopsy revealed a single gun shot to the chest.

These things started Jones thinking that his boss knew more than he was letting on. The drugs, money, and evidence implicating Carter weren't taken by the gunman because Smith wanted them to lead the Narcotics Division to Carter who was horning in on the territory already controlled by Smith and his associates. I hate it when a cop goes bad.

133. <u>Single Parent Support Group - Answer</u>

<u>Line 1</u>. Fred's last name is Adams. Mark it with a circle on the grid. Put "1" in the other cells in that row and column (clue 1 eliminated them). The teacher is female ("in <u>*her*</u> class"), so Bush is male. Put "1" in the Bush column next to Betty, Dale, and Pat.
<u>Line 2</u>. The 14-year-old is a male ("<u>*son*</u>"). Put "2" in 14 column for Barbi and Sally. The 14-year-old's parent is a mother ("<u>*her*</u>"). Put "2" in 14 for John and Steve. Mark is not the 14-year-old. Put "2" in 14 for Mark.
<u>Line 3</u>. Carter is male ("<u>*Mr.*</u> Carter"). Put "3" in Carter column for each woman. We know that Bush and Carter are both male. There are only two fathers. Put "3" under Adams, Ford, and Tyler for John and Steve. Carter is not the parent of the 17-year-old. Put "3" under Carter at age 17. Roger is not Carter's child. Put "3" under Carter at Roger. Roger is not the 17-year-old. Put "3" under age 17 across from Roger.
<u>Line 4</u>. Dale's last name is Tyler. Mark it with a circle on the grid. Put "4" in the other cells in that row and column (clue 4 eliminated them). Sally's mother is deceased. Sally's parent must be a man (Bush or Carter). Put "4" in the Sally column next to Betty, Dale, and Pat. Sally's father can't be Bush because his ex-wife is still alive. Sally is Carter! Put a circle at Sally Carter and put "4" in row and column. Sally can't be 17 because Carter is not 17. Put "4" in 17 for Sally.
<u>Line 5</u>. Sally is a year older than another child. She can't be 12 or 16. Put "5" there. By elimination (see the diagram on the next page), we

see that Sally must be 13! Put a circle under Carter on row 13 and put
"5" in the row and column cells. If Sally is 13, Dale's child must be
12 (one year younger than Sally). Sally has a male parent, so put "5"
in 13 column for Betty, Dale and Pat.

	A D A M S	B U S H	C A R T E R	F O R D	T Y L E R	12	13	14	16	17	B A R B I	F R E D	M A R K	R O G E R	S A L L Y
BETTY		1	3		4										4
DALE	4	1	3	4	◯										4
JOHN	3			3	3		2								
PAT		1	3		4										4
STEVE	3			3	3		2								
BARBI	1		4				2								
FRED	◯	1	1	1	1										
MARK	1		4				2								
ROGER	1		3							3					
SALLY	1	4	◯	4	4	5		2	5	4					
12															
13															
14															
16															
17			3												

Use the grid to see
that Sally is 13.

Line 6. John's child is a male ("*son*"). Put "6" on John row at Barbi
and Sally. By elimination (on the grid), we see that Sally is Steve's
child! Steve is Carter and has a 13-year old named Sally. Put proper
circles and "6". By elimination, John is Bush. Put a circle there.
Line 7. Pat's child is female ("*daughter*"). She must be Barbi! Put
circle and "7". The 14-year old *son* (from clue 2) is not Pat's child.
Put "7" under 14 at Pat. By elimination (14 column), we see that
Betty's child is 14. The 14-year old is male, so Barbi is not Betty's
child. Pat's child is not the oldest (17), so she must be 16 by
elimination. That makes John Bush's child 17. We know that Roger is
not 17 (clue 3), so John's child is not Roger. Betty is the only possible
Adams who could be Fred's mother. Fred is Betty's son. By
elimination, Pat's last name is Ford, Mark is John's son, and Roger is

Tyler. Put all of the circles on the grid. All of the empty squares will get "7". The solving grid for this logic problem now looks like this:

	A D A M S	B U S H	C A R T E R	F O R D	T Y L E R	12	13	14	16	17	B A R B I	F R E D	M A R K	R O G E R	S A L L Y
BETTY	◯	1	3		4	5	5	◯	7	7	7	◯			4
DALE	4	1	3	4	◯	◯	5	5	5	5	7			◯	4
JOHN	3	◯	6	3	3	5	6	2	7	◯	6		◯	7	6
PAT		1	3	◯	4	5	5	7	◯	7	◯	7	7	7	4
STEVE	3	6	◯	3	3	5	◯	2	6	6	6	6	6	6	◯
BARBI	1		4	◯			5	2	◯						
FRED	◯	1	1	1	1		5	◯							
MARK	1	◯	4				5	2		◯					
ROGER	1		3	◯	◯		5			3					
SALLY	1	4	◯	4	4	5	◯	2	5	4					
12	5	5	5	5	◯										
13	5	5	◯	5	5										
14	◯	6	5		5										
16			5	◯	5										
17		◯	3		5										

The answer is:

Betty Adams has a child named Fred, 14.
Dale Tyler has a child named Roger, 12.
John Bush has a child named Mark, 17.
Pat Ford has a child named Barbi, 16.
Steve Carter has a child named Sally, 13.

134. Fahra Weigh Places - Answer

There doesn't seem to be enough information to answer the questions without guessing, but let's consider the questions out of order.

3. Fahra weighs 10 pounds less than the class average. Based on the multiple-choice answers provided in this question, here are the possible average weights (Fahra + 10) for the class:

a. 51   b. 72   c. 78   d. 81   e. 92

From the original description we know the total class weight is 1218 (698 + 520). Dividing this number by each of the average weights above, we calculate possible numbers of students:

<div align="center">a. 23.9   b. 16.9   c. 15.6   d. 15.0   e. 13.2</div>

None of them comes out perfectly even, but d is the closest to an exact number of students. In fact, we know that a and b can't be right because Fahra would have more than 15 classmates. The largest number of classmates in Question 1 is 15. Let's use 15 as the class size and come back to 16 or 13 if we encounter a problem.

2. Question 2 implies that four out of the five statements are true. We can look for statements that can't both be true. If there are 15 students in the class, at least one student must sit at a single desk. That means that answers a and e can't both be true. If all girls and all boys sit at double desks, there would need to be an even number of students. Because either a or e is false, we know that b, c, and d are all true.

That means that every boy weighs between the class average (81) and 98. Therefore, there are eight boys in the class. 7 boys with a total weight of 698 would require boys heavier than 98; 9 boys would require boys weighing less than 78.

We can now determine the answers to the first three questions. There are 15 students, so Fahra has 14 classmates. The answer to question 1 is d. We already know that a and e in Question 2 can't both be true. If a is false, then eight boys must sit at seven double desks without sitting with another boy. It can't be done. The answer to Question 2 is e. With 15 students, the average weight is 81 (1218 / 15). The answer to Question 3 is d.

135. Guess the Number with a Lie – Answer

Start by asking questions that will eliminate half of the 16 numbers, each in a different way. Here's one possible set of questions.

  Q1. Is the number greater than 8?
  Q2. Is the number in the following list: 1,2,3,4,9,10,11,12?
  Q3. Is the number an even number?

If it weren't for that pesky lie, these three questions would narrow down the possibilities to two numbers. It's time to see if I lied.

  Q4. Did you lie in any of your answers to the first three questions?

Case I. My answer to Q4 is No. The first three questions must be true, or else I'd be lying twice; the rules only allow me to lie once. The first three questions narrow it down to two numbers. Pick one of the two numbers and ask if that is my number until you get two answers that are the same. For example, if you've narrowed it down to 5 and 7:

  Q5. Is it 7?   A. No. If I lied, it still might be 7.
  Q6. Is it 7?   A. Yes. I lied to either Q5 or Q6.
  Q7. Is it 7?   A. No. This is true; it is not 7. The answer is 5.

Case II. My answer to Q4 is Yes. If I lied in Q1-Q3, then I must answer Yes to Q4, but I might also say Yes if I'm lying in Q4. Either way, I have used up my lie and must answer truthfully from now on.
Q5. Did you lie in your answer to Q1 or Q2?
    If the answer to Q5 is Yes,
    Q6. Did you lie in your answer to Q1?
        If **Yes**, Q1 was a lie, Q2 and Q3 were true. You have
        narrowed it down to two numbers and have one question
        left which must be answered truthfully. You win.
        If **No**, Q2 was a lie, Q1 and Q3 were true. You have
        narrowed it down to two numbers and have one question
        left which must be answered truthfully. You win.
    If the answer to Q5 is No,
    Q6. Did you lie in your answer to Q3?
        If **Yes**, Q3 was a lie, Q1 and Q2 were true. You have
        narrowed it down to two numbers and have one question
        left which must be answered truthfully. You win.
        If **No**, Q1 and Q2 and Q3 were all true. You have narrowed
        it down to two numbers and have one question left which
        must be answered truthfully. You win.

Here's an example. My answers to the first four questions are Yes. You ask Q5 (Did you lie in your answer to Q1 or Q2?), and I say Yes. You ask Q6 (Did you lie in your answer to Q1?), and I say No. My answers to Q1 and Q3 were true, so you know that my number is either 14 or 16. You ask Q7 (Is it 14?), and I answer (truthfully) No. The number is 16.

Answers

Chapter 8 – Child's Play

136. <u>Dots a Double Exposure - Answer</u>

The lettered dots form a rabbit. The numbered dots form a windmill.
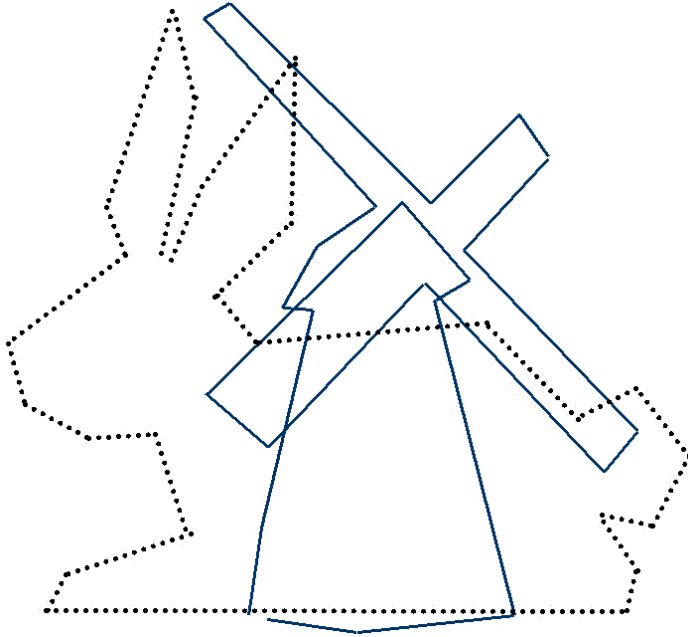
137. <u>Basic Paint-by-Numbers - Answer</u>

138. <u>Visualize by Numbers - Answer</u>

Picture 1 is
a jazz combo.

Picture 2 is
a mermaid
and fish.

Picture 3 is a
tiger in the jungle.

139. <u>Twice Hidden Objects - Answer</u>

Here are the hidden names of the hidden objects.

1. Off**ice Cream Co. ne**xt door
2. Dog**s hear s**ounds
3. A **bell**ows
4. Medical **kit, e**mpty
5. High t**axe**s
6. Hel**p addle**d brain
7. Deli**cat**e lace
8. **Comb**ination lock
9. D**apple**d colors
10. Sacre**d art**work
11. As**sail boa t**o get away
12. Sin**g rap, es**sentially
13. Sel**fish hook**y player
14. **Rabbi T**evya
15. Lady**bird** beetle
16. Ta**boo M.E. rang**er
17. Measure one goo**gol ft. ee**rily
18. Garbage s**cow boy's boot**legging
19. Pauper'**s hovel**
20. Celtic trio has **sung lasses** a song

Here are the pictures (taken out of context and sometimes rotated).

1. Ice cream cone is the damsel's face and hat.
2. Shears are the jester's flowers and vest.
3. Bell is negative space between the horse's front legs.
4. Kite is the jester's left shoulder.
5. Axe is the cleric's sleeve and strip of cloth.
6. Paddle is a trumpeter's horn, head, and space behind.
7. Cat is the king's beard.
8. Comb is the ruff below the king's beard.
9. Apple is part of the horse's neck trapping.
10. Dart is the small flower the jester is giving the king.
11. Sailboat is the king's arm and the damsel's dress.
12. Grapes are part of a trumpeter's hat and nearby tree.
13. Fishhook is part of the jester's hat.
14. Rabbit is part of the king's front adornments.
15. Bird is part of the cleric's face and collar.
16. Boomerang is part of the cleric's hat.
17. Golf tee is the last trumpeter's horn.
18. Cowboy's boot is mostly negative space at the tree.
19. Shovel is the knight's lance and arm.
20. Sunglasses are the king's mustache.

140. <u>Catching Some Z's - Answer</u>
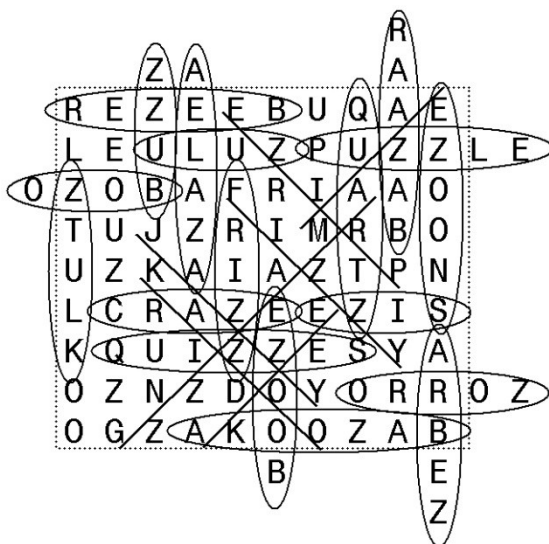
141. <u>What Has Changed? - Answer</u>

The differences (from upper left to lower right) are:

1. The lowest fold (wrinkle) in the drape is lower on the second drawing.
2. The vertical window pane separator is farther to the right in the second drawing.
3. The painting has more paint on it in the second drawing.
4. There are 5 (not 6) brushes in the jar on the second drawing.
5. The rightmost brush in the jar is longer on the second drawing.
6. The back of the artist's smock is not as big in the second drawing.
7. The paint blobs on the palette are in a different sequence.
8. The trough, or shelf, on the easel has an extra line in the second drawing.
9. The perspective is different for the end table in the second drawing.
10. The tube of paint on the table is turned a different way.

142. Mystery of the Lost Letters - Answer

What possibilities do we have for filling in the missing letters. "LE" can end with A, D, E, G, I, T, X, and Y. The only letter that will work with the Down word is I, making the Across word LEI. The Down word is either IDEAL or IDYLL. If we use IDYLL, the cross words would be SYSTEM and BEL, but that makes a non-word "SE" down from SYSTEM. IDEAL gives us BOA instead of BEL and SO instead of SE. There are several choices for the Across word starting with S.

The next Down word to the right is either MUTANT, MUTING, MUTINY, or the unusual MUTINE or MUTONS. MUTANT makes the Across word TRUST or TRYST; MUTING makes it GRIST; the others won't work. The only way GRIST could work is to use DENI (Macedonian currency) as the cross word; that's a little obscure, so let's put that one on hold. TRYST makes the cross word DENY, and TRUST makes the cross word GENU or MENU. Neither of these last two words will form a valid word with "SE?TE?" going across. Let's choose MUTANT, TRYST, DENY, and SEATED for this section.

Back on the top row, the only two choices are MOREL and MORES, and only MORES forms an acceptable Down word (SORBET). SORBET's cross word must be EBBED, EMBED, or EMBER. Only EMBER can form a valid cross word starting with "T." "LIL" must end with "T" or "Y." TRIVET (down) and LILT (across) is the only combination that works. SELF completes the right side.

In the puzzle's lower left corner, only DEBRIS and EBB will fit. That forces DEBRIS's cross words to be BOUND and RASP.

L	E	I		M	O	R	E	S	
		D		U				O	
	S	E	A	T	E	D		R		T
B	O	A		A		E	M	B	E	R
O		L		N		N		E		I
U				T	R	Y	S	T		V
N		E			A		E			E
D	E	B	R	I	S		L	I	L	T
		B			P		F			

143. <u>Won through Nine (Sudoku) - Answer</u>

Apply method 1 from the chapter text. Make small notations if we can narrow down a number to two cells within a block. Starting with 9 and working backwards to 1 is also helpful in this case. Notice that there are 9s on row H and column 3, so we can narrow the 9s in the lower left block to G2 or I2. This means that there can be no 9s in column 2 in the upper left block. It helps us place a 9 in cell C1. We could only locate two 9s and one 8, but we have some other clues.

In the lower right block there are two cells that are the only homes for 3 and 7. Therefore, no other numbers can be in those two cells. Cell G8 must be 6, and 9 must be in row G for that block. That means that I2 must be 9. What values can exist in squares A4 and A5? Method 3 tells us that both must have either 1 or 6. So A8 is not 1; C8 is 1.

Method 1 tells us that B1 and B2 must house 6 and 7. Therefore, A2 is 8. A7 is the only cell on row A that can be a 3, and that forces A8 to be 9. A6 must be 5. We narrow down C2 and C3 using method 2.

Starting with the diagram on the left above, we apply method 3 to cell C7 and find that it must be 2. That forces numbers into C4, C6, and B5. The 2 in column 5 forces a 2 into cell G4 and into cell H9. The 7 in C4 forces a 7 into cell D6, a 6 into cell D5, a 1 into cell F4, a 1 into cell A5, a 6 into cell A4, and an 8 into cell I4. Wow.

	1	2	3	4	5	6	7	8	9
A	4	8	2	6	1	5	3	9	7
B	6 7	6 7	1	9	2	3	8	5	4
C	9	3 5	3 5	7	8	4	2	1	6
D	8	2	9	3	6	7	5	4	1
E		3	3	4	5	8	(7)	2	9
F		4	4	1	9	2	6	8	3
G	3	5	5	2	7		9	6	8
H				5	3	9	4	3 7	2
I	2	9		8	3		1	3 7	5

	1	2	3	4	5	6	7	8	9
A	4	8	2	6	1	5	3	9	7
B	6 7	6 7	1	9	2	3	8	5	4
C	9	3 5	3 5	7	8	4	2	1	6
D	8	2	9	3	6	7	5	4	1
E	1	1	3	4	5	8	7	2	9
F		4	4	1	9	2	6	8	3
G	3	5 4	5 4	2	7	(1)	9	6	8
H	1	1		5	3	9	4	7	2
I	2	9		8	4	6	1	3	5

E7 must be 7, which makes E9 and G7 9s. That makes D9 a 1 and G9 an 8. It also forces numbers into B7, B8, and B9. Column 7 can now be filled using method 2. D8 and E8 can be filled as well. Method 2 fills row D and column 8, putting 2 into each of the open cells.

In the second diagram above we apply method 1 again. We see that G6 must 1, I6 must be 6, I5 must be 4, and H5 must be 3. That determines H8 and I8. The center and right columns are complete.

	1	2	3	4	5	6	7	8	9
A	4	8	2	6	1	5	3	9	7
B	6 7	6 7	1	9	2	3	8	5	4
C	9	(3 5)	(3 5)	7	8	4	2	1	6
D	8	2	9	3	6	7	5	4	1
E	1	1 3	6	4	5	8	7	2	9
F	(5)	4	4	1	9	2	6	8	3
G	3	(5 4)	(5 4)	2	7	1	9	6	8
H	1 6	1 6	8	5	3	9	4	7	2
I	2	9	7	8	4	6	1	3	5

	1	2	3	4	5	6	7	8	9
A	4	8	2	6	1	5	3	9	7
B	7	6	1	9	2	3	8	5	4
C	9	5	(3)	7	8	4	2	1	6
D	8	2	9	3	6	7	5	4	1
E	1	3	6	4	5	8	7	2	9
F	5	7	4	1	9	2	6	8	3
G	3	4	5	2	7	1	9	6	8
H	6	1	8	5	3	9	4	7	2
I	2	9	7	8	4	6	1	3	5

We can find a few more numbers using method 1. Then, notice that C2 and C3 and G2 and G3 are the only places for 5's in those blocks. That means that the middle left block can't have a 5 in column 2 or 3. Cell F1 must be a 5. In the same way we can see that 6 must be in cell

E3 of that same block. Finally, we analyze column 3 and see that the number 3 must go in cell C3. This puts 5 into C2 and G3. It also forces 4 into G2 and F3. Method 2 determines that 7 goes into cell F2, and the rest of the cells fall into place.

144. <u>Word Evolution - Answer</u>   (Other answers are possible.)

TRY-TOY-TON-TIN-**WIN**
KISS-MISS-MUSS-MUGS-**HUGS**
EWE-EYE-RYE-RUE-RUM-**RAM**
ROCK-ROOK-TOOK-TOOL-TOLL-**ROLL**
SLIP-SLID-SAID-SAIL-FAIL-**FALL**
PIES-PINS-PINE-PANE-CANE-**CAKE**
FOOL-FOOD-FOND-FIND-FINE-WINE-**WISE**
THINK-THICK-TRICK-TRACK-TRACT-TRAIT-TRAIN-
     BRAIN
OLD-ODD-ADD-AID-BID-BED-FED-FEW-**NEW**
WISH-FISH-FIST-FEST-FEET-FRET-FREE-TREE-**TRUE**
FROWN-FLOWN-FLOWS-SLOWS-SLOTS-SPOTS-SPITS-
     SPITE-SMITE-**SMILE**

145. <u>Group Therapy - Answer</u>

If you were able to group the 15 pictures into 5 logical groups of three pictures each, then you solved the puzzle and don't need to see my answer. Here is how I identified the pictures:
Bird, headline, plane, headstone, monk, butterfly, house, headphones, loop, helicopter, scissors, polo, wrench, cheers, and pool.
I noticed that the plane, scissors, and wrench are all hand tools. The bird, butterfly, and helicopter all fly. Look at the remaining <u>words</u>. Three of them start with "head," so I grouped headline, headstone, and headphones together. Three of the words are anagrams of each other: loop, polo, and pool. The remaining words are monk, house, and cheers. Finding the common denominator there is a bit harder! Each is the name of a popular television series that ran for several seasons. Now you see why this was a challenger puzzle.

146. <u>"S" Is for Starters - Answer</u>

My list of things that start with the letter "S" generally goes from top to bottom and left to right. Items in parentheses are alternate words for the same object and aren't included in my count. An item followed by a question mark is something that is visible only in a

manner of speaking; for example, a definition for sinew is muscular strength and the surfer is flexing his muscles. These are not included in my count either.

Calendar picture: seascape, scene, sun (sunlight? sunshine?), sky, stratus clouds, skyscraper, skyline, sea, sailboat (sloop? skiff?), streamer, sail, spinnaker, stern, starboard, side, surf, surfer, surfboard, skeg (surfboard fin), swimsuit, sideburns, sinew?, stomach?, shin, ship (steamship? steamer?), smokestack, smoke, spray, splash, splatter (suds?), shore (seashore), station, stairs, steps, shadow, shade, seat, sign, struts, supports?, sombrero, sunbather, sunglasses (shades), shoulder, stripes, spread?, sandals, sole, strap, swimmer, stroke, swim fin, snorkel, shell (scallop?), sand, shovel (spade, scoop?), sand castle (sculpture?) – count = 53

Photograph stapled to calendar: snapshot, staple, spouse, siblings, son, sister, salutation?, signature, superlative, suffix, slang, "Steph," "Sam," "Suzie," sobriquet, scarf, sash, skirt, stockings, spectacles, scowl (sneer?), shirt, sleeve, suspenders, shorts, socks, shoes, shoelaces (strings), sucker, scenery, snow, statue, stand, stallion, soldier, sword, saddle, stirrup, spur – count = 38

Calendar section: summer (if you're in the Southern hemisphere, August isn't summer, but the picture is of summer), strip, Sunday, Saturday, squares, smear (smudge), scribble (squiggle?), six, seven, suggestion, serif typeface, serifs, stress, syllable, schwa, spelling?, stamp, sticker, serration, smile, smilie, slogan (statement, saying, sentence), "say", sans serif type, "surgery," strikethrough, sixteen, seventeen, snowflake, statistic, seventy-five, swearing, symbols, spiral, sharp, skull-and-cross-bones, slash, star, "sleet," "snow," storm?, September, section, set (of days), subset, sector (of calendar), spaces – count = 45

Scrap of paper (sticky note) in lower right corner: sticky note (scrap of paper), square, superscript, subtraction, sum, sixty, subtotal, sixty-three, sigma, seventy – count = 10

General: stuff, solids, structures, situations, substance, speck – count = 6

I suspect if we look hard enough, we can find another 150, but I'm exhausted.

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