

**Learn & Play**



# Sudoku

for Second Grade





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**Learn & Play**



# Sudoku

for Second Grade



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**SHELL EDUCATION**

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## What Is Sudoku?

Whether you are traveling or just relaxing on a Sunday morning, Sudoku is a pastime that the whole family can enjoy. The Sudoku craze has taken over. It is goodbye to crossword puzzles and magic squares and hello to Sudoku. If you search the word *Sudoku* on Google™, you will get over 70 million hits. Sudoku puzzles are published in newspapers, magazines, and books. They even come in electronic handheld games or interactive games on the Web.

Sudoku is a logic puzzle. Each puzzle has one or more mini-grids. Each mini-grid has boxes that are arranged in rows and columns.

Hints are given in some of the boxes. There are different types of puzzles. The puzzles can be  $1 \times 1$  grids,  $2 \times 2$  grids,  $2 \times 3$  grids,  $3 \times 3$  grids, or even more. Pictures, letters, and numbers are all used within the puzzles in this series.

The objective of a Sudoku puzzle is to fill in all the boxes of the puzzle using only the given hints. Each column, row, and mini-grid must have each picture, letter, or number only once. That means you have to pay attention to three things while you try to solve these puzzles. You have to look up and down the column, across the row, and around the mini-grid!



Source: TheSupe87/Shutterstock, Inc.

## The History of Sudoku

How did the Sudoku craze start? Sudoku puzzles first appeared in a U.S. magazine in 1979. At that time it was called "number place." A magazine editor from Japan saw the number place puzzle and liked it so much that he decided to create a magazine with his version of it. He called the puzzle Sudoku. The word *su* in Japanese means *number*, and the word *doku* means *single*. The puzzle became very popular in Japan. Today, 660,000 Sudoku magazines are circulated every month in Japan.



Source: Daniel Gale/Shutterstock, Inc.

The Sudoku craze spread to the United Kingdom when Wayne Gould saw the puzzle in a magazine while working in Hong Kong. He was fascinated by the puzzles, so he created a computer program to generate Sudoku puzzles. Then, he sold his idea to the *London Times*. They used Gould's program to create a series for their daily games pages. Other newspapers then jumped on the bandwagon, spreading the craze back to the United States. In April 2005, Sudoku became a regular feature in the *New York Post*. *The Daily News* and *USA Today* followed a few months later.

## The History of Sudoku (*cont.*)

### Deep Roots

The puzzle goes back further than 1979. It actually has its roots in Latin Squares. Latin Squares were taken from the work of Swiss mathematician Leonhard Euler. He lived from 1707 to 1783. A Latin Square is a square grid that contains sets of different symbols repeated. The cells of the grid contain each symbol only once and the symbol can appear only once in each row and column. (Sound familiar?) Sudoku puzzles are really Latin Squares that have some of the symbols already filled in, and you have to fill in the rest. A set of Latin Squares is combined to form a Sudoku puzzle.

### A Mental Sport

In 2006, the World Puzzle Federation held its first World Sudoku Championship. Like the Olympics, different countries send teams. There are both individual and team competitions. Each country can enter six participants plus one nonplaying captain. The participants have to solve different variations of Sudoku puzzles.

### Find Out More

- What other number puzzles have similar rules to Sudoku?
- What other ideas have come from mathematician Leonhard Euler?

### Sudoku Research

Sudoku is a kind of logic puzzle. No mathematical skills are needed to solve the puzzles, and you do not even need to use arithmetic. People solve the puzzles by logical reasoning alone (Sharp 2006). For this reason, these puzzles can be interesting and addictive for both children and adults alike. Not only are the puzzles a fun hobby, but the skills used to solve Sudoku puzzles can be transferred and applied to other areas of life.

For young people, the main benefit of solving Sudoku puzzles is the development of logical reasoning skills. These skills will help them solve math problems.

There is a misconception that logical reasoning has nothing to do with mathematics. This seems to be tied to the idea that mathematics is about numbers. Indeed, Sudoku puzzles could have letters or colors or pictures instead of the numbers or any other property that comes with various attributes. (Sharp 2006)



Portrait by Johann Georg Brucker

## Sudoku Research (cont.)

The heart of the puzzle, the mini-grid, is really a math problem about arrangements or combinations of objects (Sharp 2006). Logic is required in most areas of mathematics, and many examples of math problems can be given that require logical reasoning. Students can also use logical reasoning skills to find new ways to look at a problem and develop creative problem solving strategies.

To fully understand the depth of math concepts and become lifelong learners of mathematics, students need both logical reasoning and problem-solving skills. By solving Sudoku puzzles, students will begin to develop systematic thinking. They will learn to identify patterns and apply them. And, they will develop an awareness of the need to examine data carefully. These skills will also transfer over to other content areas, such as language acquisition. Puzzles are “well suited for contributing to a problem-based environment that is conducive to learning in the second-language classroom and may play an important role in the development of critical and higher-order thinking skills.” Most importantly, puzzles offer second-language students the opportunity to repeat vocabulary and sentence structures in authentic contexts (Raizen 1999).

In the classroom, Sudoku puzzles are an easy way to differentiate instruction. The different grade levels of Sudoku can be used in one classroom. Each student can be given a puzzle from the grade level and skill level that best suits his or her cognitive development of logical reasoning and problem-solving skills.

Riddles and puzzles have broad appeal and are accessible to literally all ability levels. The conditions and objectives of the problems that are posed as puzzles are usually understood easily, although the solutions may be challenging. Even though some students may not be able to solve every puzzle, many enjoy the challenge of the attempt. (Evered 2001)

Students who have not been successful in mathematics can find success in solving Sudoku puzzles. In the preface to Raymond Smullyan’s book, *The Lady or the Tiger and Other Logic Puzzles*, he states, “So many people I have met claim to hate math, and yet are enormously intrigued by any logic or math problem I give them, provided I present it in the form of a puzzle. I would not be at all surprised if good puzzle books prove to be one of the best cures for the so called, math anxiety” (1982).

Sudoku puzzles serve as an excellent warm-up activity, closing activity, problem-of-the day, enrichment activity, or break from the traditional curriculum content. Will Shortz, a puzzle creator and editor, states, “You can learn it in 10 seconds, and yet the logic needed to solve Sudoku is challenging. It’s a perfect amount of time to spend on a puzzle, anywhere from five minutes to half an hour” (Bennett 2006).

## Sudoku Research (cont.)

The puzzles are engaging and addictive for students. Filling in the empty cells appeals to them, and the rush at the very end to complete the puzzle gives them a great feeling of accomplishment. This inherent element of solving the puzzle adds a level of excitement to the classroom and is an intrinsic motivator for students (Evered 2001). The puzzle serves as a catalyst for learning (Raizen 1999).

For both adults and students, Sudoku is a way to sharpen your brain and improve your focus. It requires concentration, patience, and self-discipline. According to Shortz, "You have to be focused to be a good Sudoku solver, because if you make a mistake and then base further logic on the mistake you made you have no option but to erase everything and start over. So Sudoku really teaches you to be careful" (Bennett 2006). Sudoku can also be a way to reduce stress or anxiety. While working on the puzzle, all other challenges and worries can be put aside. The puzzle becomes your focus and as a result, your brain feels refreshed and ready to tackle whatever life throws at you. Other researchers are finding Sudoku as a way to slow the progress of Alzheimer's disease (Critser 2006).

This puzzle with its simple rules and small numbers can be a tool for students, teachers, and parents. For students, it helps them develop logical reasoning skills and problem-solving strategies. Students will become self-disciplined, patient, and careful problem solvers. For teachers, it is a tool for differentiating instruction, engaging students, and supporting language acquisition. For parents, it is a family pastime that reduces stress, increases focus, and turns a child from a math hater to a math lover.



Source: Ramon Berk/Shutterstock, Inc.

## Works Cited

- Bennett, J. 2006. Addicted to Sudoku. An interview with Will Shortz. *Newsweek* (Society, Web Exclusive), February 23.
- Critser, G. 2006. Changing minds in Alzheimer's research. *Los Angeles Times*, November 5.
- Evered, L. J. 2001. Riddles, puzzles, and paradoxes. *Mathematics Teaching in the Middle School* 6 (8): 458–461.
- Raizen, E. 1999. Liar or truth-teller? Logic puzzles in the foreign-language classroom. *Texas Papers in Foreign Language Education* 4 (n1): 39–50.
- Sharp, J. 2006. International perspectives, beyond Su Doku. *Mathematics Teaching in the Middle School* 12 (3): 165–169.
- Smullyan, R. 1982. *The Lady or the Tiger and Other Logic Puzzles*. New York: Alfred Knopf.

## Learn to Play Sudoku

### Sudoku Words

- **mini-grid**—group of square boxes that make a larger square
- **column**—line of boxes that goes up and down
- **row**—line of boxes that goes side to side
- **hints**—boxes that are filled in before you start the puzzle

### Sudoku Rules

- Every mini-grid must have only one of each picture, number, or letter.
- Every column must have only one of each picture, number, or letter.
- Every row must have only one of each picture, number, or letter.

### How to Play

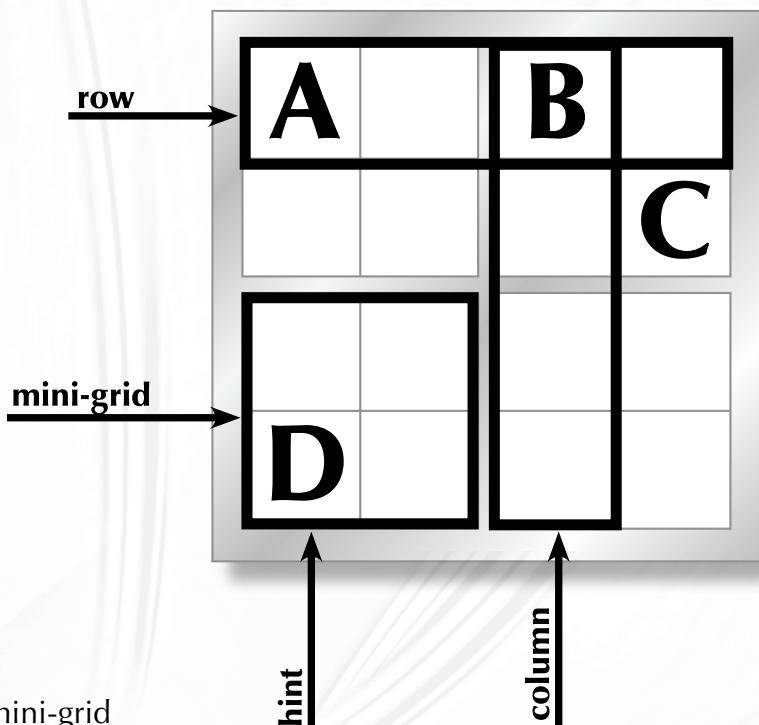
- **Step 1**—Look at the puzzle. Find a mini-grid that has lots of hints.
- **Step 2**—Look at each row and column of the mini-grid. Fill in the missing pictures, numbers, or letters. Each picture, number, or letter can only be used once!
- **Step 3**—Look at the columns and rows again. Check to make sure none of the pictures, numbers, or letters are the same. Move any that are the same.
- **Step 4**—Do these steps again for each mini-grid.

### Top Secret Tip



Try this! Don't look for the mini-grid with the most hints. Look for the column or row with the most hints. Then start the puzzle there.

### The Parts of a Sudoku Puzzle



## Strategies for Sudoku

### What Is a Strategy?

A strategy is a plan. It is a way to solve a puzzle. It is good to have a plan. That way, you know what steps to take as you work. Strategies help you solve Sudoku puzzles. Without a strategy, you may work really hard. And even then, you might not solve the puzzle. With a plan, you know you will do well.

### Strategy 1—Use Cutout Pictures, Numbers, or Letters

#### Step 1

- Cut out the pictures, numbers, or letters on pages 61–62.

#### Step 2

- Find an empty box. This box is in a mini-grid.
- Move a picture, number, or letter into the box.

#### Step 3

- Look at the column with your piece.
- Is any picture, number, or letter there two times?

#### Step 4

- Look at the row with your piece.
- Is any picture, number, or letter there two times?

#### Step 5

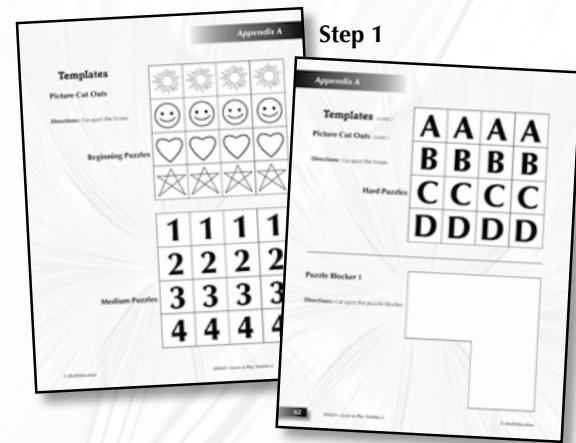
- If any picture is there two times, put a different picture, number, or letter in the box.
- Check the mini-grid, row, and column again.

#### Step 6

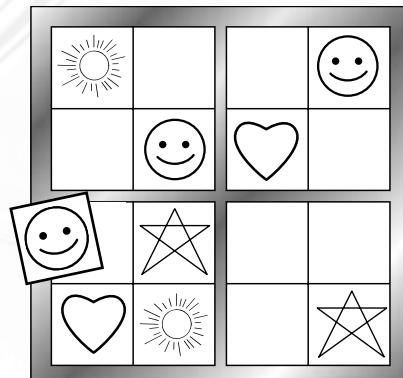
- Find another empty box.
- Move a picture, number, or letter into the box.
- Do steps 3, 4, and 5 again.

#### Step 7

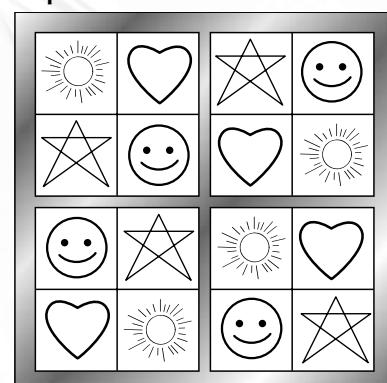
- If you get stuck, put a different picture, number, or letter in the box.
- Check each mini-grid, row, and column.
- Yeah! You did it!



#### Steps 2–5



#### Step 7



# Introduction

## Strategies for Sudoku *(cont.)*

### Strategy 2—Using a Puzzle Blocker

#### Step 1

- Cut out Puzzle Blocker 1 (page 62) and Puzzle Blocker 2 (page 63).

#### Step 2

- Put Puzzle Blocker 1 over the puzzle.
- You only want one mini-grid to show.

#### Step 3

- Fill in the empty boxes on the mini-grid.
- Remove Puzzle Blocker 1.

#### Step 4

- Place Puzzle Blocker 2 on a row across the mini-grid.
- Check the pictures, numbers, or letters. Make sure no picture, number, or letter is there two times.
- If the pictures, numbers, or letters are the same, change them in the mini-grid.

#### Step 5

- Place Puzzle Blocker 2 on a column from the mini-grid.
- Check the pictures, numbers, or letters. Make sure no picture, number, or letter is there two times.
- If the pictures, numbers, or letters are the same, change them in the mini-grid.

#### Step 6

- Go back and forth with the puzzle blockers. Check each mini-grid, row, and column.



#### Top Secret Tip

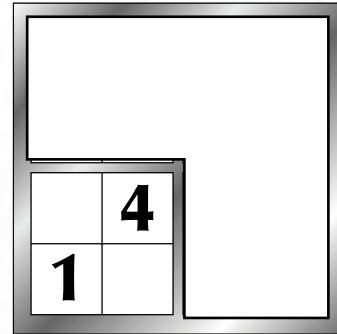
The cutout pieces and Puzzle Blockers can be used together. That would mean less erasing for you!



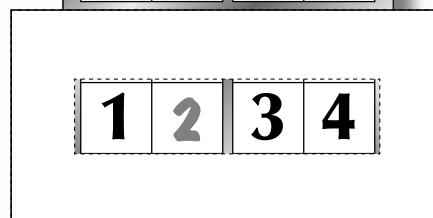
Step 1



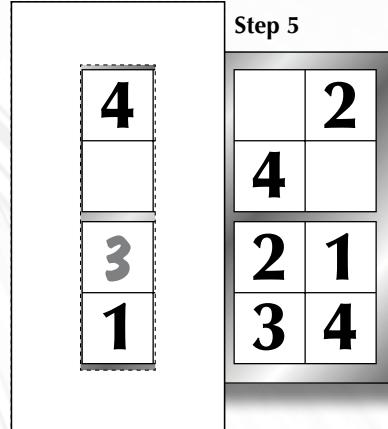
Step 2



Step 4



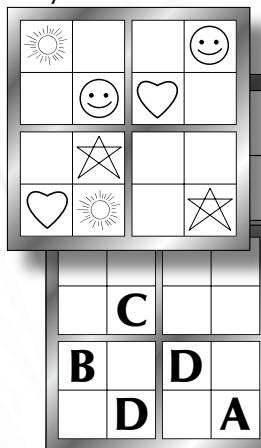
Step 5



## How to Use This Book

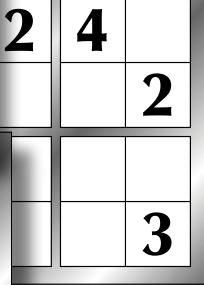
### Leveled Puzzles

**Easy**



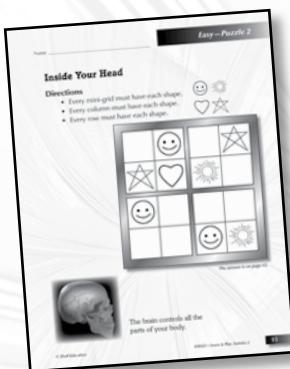
**Hard**

**Medium**



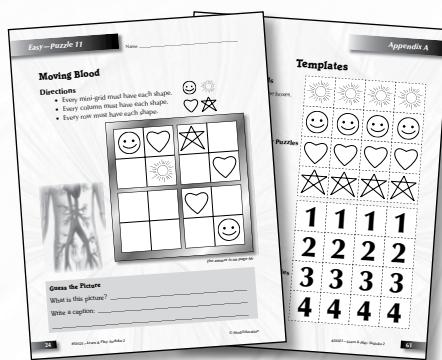
- The Sudoku puzzles in this book are divided into three levels: easy, medium, and hard. Each level has a specific puzzle variation. There are 15 puzzles for each level. That makes a total of 45 puzzles in this book.
- As students move through each level, the puzzles get more difficult. When math teachers created these puzzles, they progressively decreased the number of hints within each variation. They also analyzed the difficulty of each puzzle by the types of logic needed to solve it. Puzzle solvers solved the puzzles to ensure there was one correct solution for each puzzle. In addition, each level of *Learn & Play: Sudoku* was field tested in classrooms.

### Themes of Puzzles



- Each of the three levels has a content-area theme tied to state and national standards. The easy puzzles have a science theme. The medium puzzles have a math theme, and the hard puzzles have a social studies theme.
- All the math themes are tied to the Curriculum Focal Points as identified by the National Council of Teachers of Mathematics.
- Throughout each section, the titles, images, and captions relate to the theme.

### Special Additions and Appendices



- Special additions are included within each section of puzzles. Some pages have fun facts related to the images. On other pages, students get to write their own fun facts. The last five puzzles in each section show close-ups of pictures. Students should guess what the picture is and write a new caption.
- The appendices include templates, a list of photograph sources, and the answer key. The answer key shows the completed puzzles for your reference.

## Puzzle Variations at Each Grade Level

	Easy or Beginner		Medium or Intermediate		Hard or Challenging	
	Variation	Hints	Variation	Hints	Variation	Hints
<b>First Grade</b>	1 x 1 with pictures	3–1	2 x 2 with pictures	11–8	2 x 2 with numbers	8–5
<b>Second Grade</b>	2 x 2 with pictures	11–8	2 x 2 with numbers	7–5	2 x 2 with letters	6–4
<b>Third Grade</b>	2 x 2 with letters	6–4	2 x 3 with letters	20–18	2 x 3 with numbers	17–14
<b>Fourth Grade</b>	2 x 3 with letters	17–15	2 x 3 with numbers	15–13	3 x 3 with numbers	44–40
<b>Fifth Grade</b>	2 x 3 with numbers	12–10	3 x 3 with letters	40–36	3 x 3 with numbers	36–32

## Correlations

The activities in this book meet the following standards:

- Students understand and apply basic principles of logic and reasoning.
- Students effectively use mental processes that are based on identifying similarities and differences.
- Students apply basic trouble-shooting and problem-solving techniques.
- Students apply effective decision-making techniques.
- Students use trial and error and the process of elimination to solve problems.

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A correlation of these standards for your state can be printed directly from the Shell Education website: <http://www.shelleducation.com>. If you require assistance in printing correlation reports, please contact Customer Service at 1-800-877-3450.

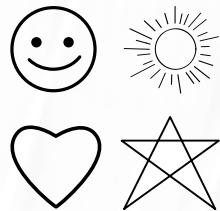
## **My Body**



## Muscles of the Body

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



Sun	
	Smiley Face
	Heart
	Star
Smiley Face	
	Heart
	Star
Heart	Sun
	Star



Muscles make it possible  
for us to move.

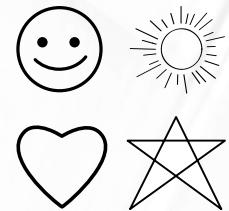
The answer is on page 65.

Name \_\_\_\_\_

## Inside Your Head

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



A 4x4 Sudoku grid puzzle. The grid is divided into four 2x2 mini-grids by thick gray lines. The symbols in the grid are as follows:

	Smiley Face		Star
Star	Heart	Sun	
Smiley Face			
	Smiley Face	Sun	

The answer is on page 65.

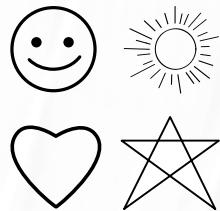


The brain controls all the parts of your body.

## X-ray Vision

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



Sun	
Star	
	Sun
Smiley Face	
Star	Heart

The answer is on page 65.



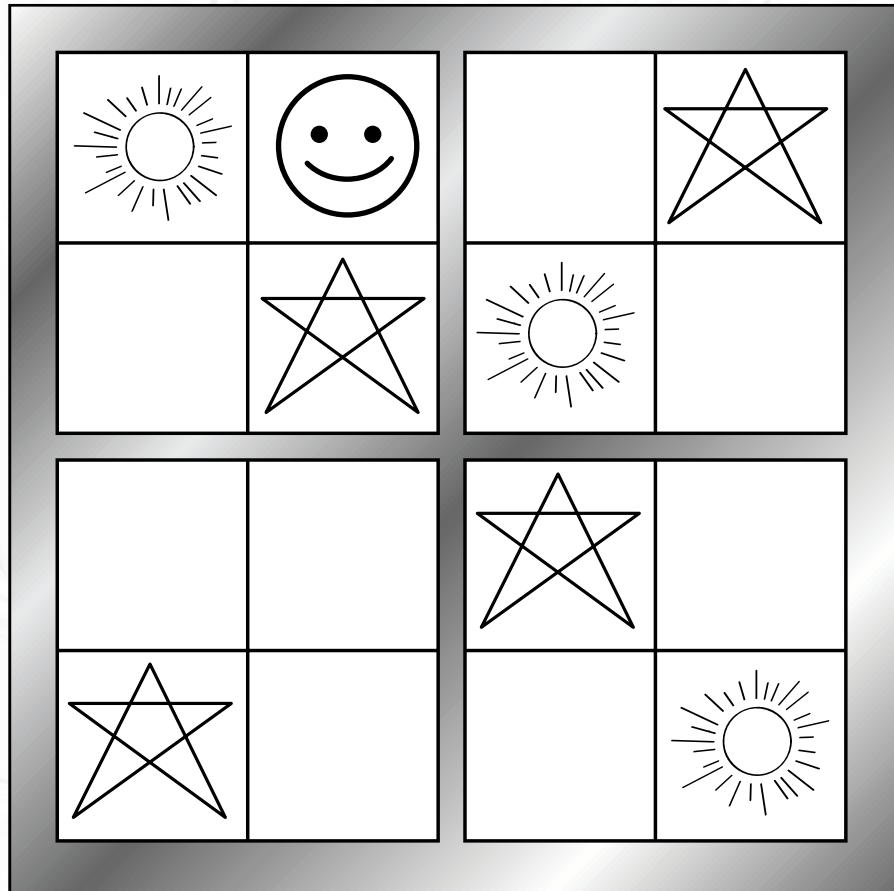
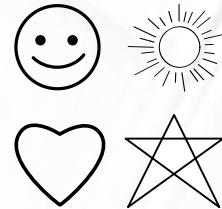
An X-ray is a picture of your skeleton.

Name \_\_\_\_\_

# Long Strides

## Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



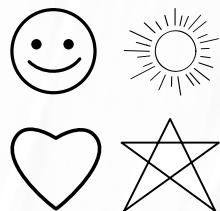
When we run, our bodies need a lot of oxygen.

*The answer is on page 65.*

## On the Boardwalk

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



	★	
	☺	
		★
♥	☀	
		☀

The answer is on page 65.



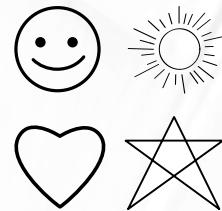
When we walk, we use  
the muscles in our legs.

Name \_\_\_\_\_

# Bones! Bones!

## Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.




Your bones connect together to make your skeleton.



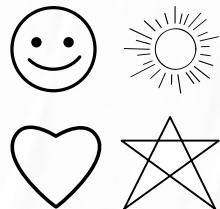
*The answer is on page 65.*

A newborn baby has about 300 bones. Adults have only about 260 bones! Where do they go?

## Thump, Thump

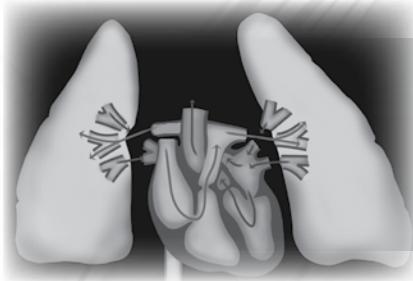
### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.




The heart pumps blood throughout your body.

*The answer is on page 66.*



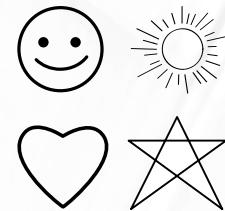
Write your own fun fact: \_\_\_\_\_

Name \_\_\_\_\_

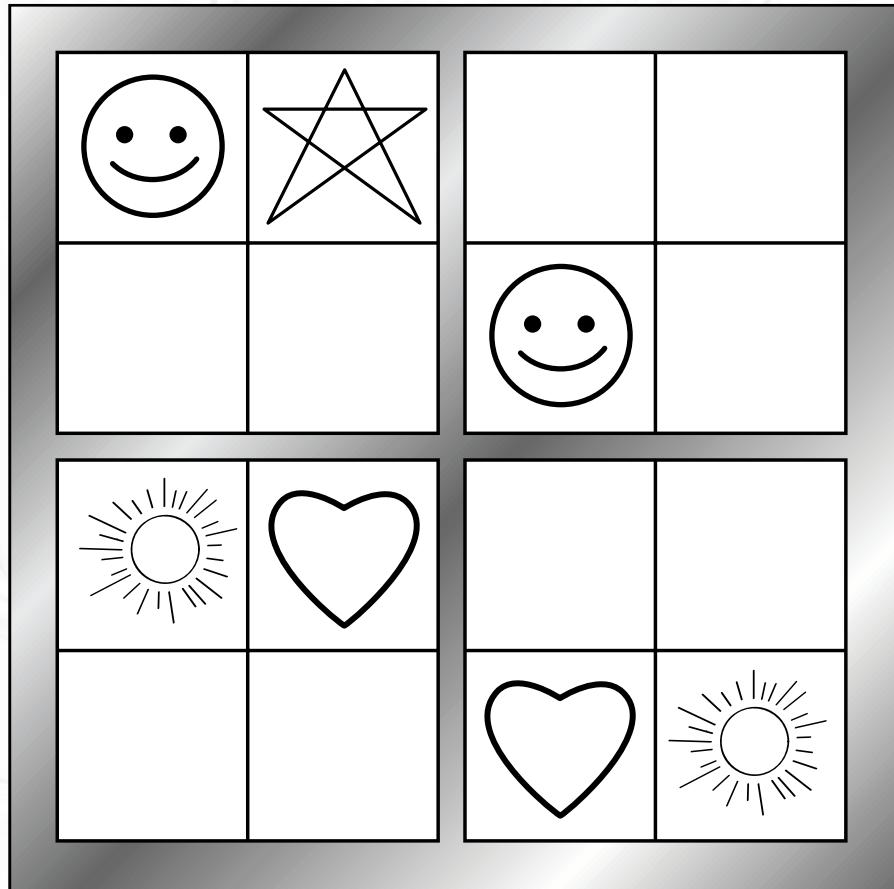
# Pumping System

## Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



Your blood, heart, veins, and arteries form your circulatory system.



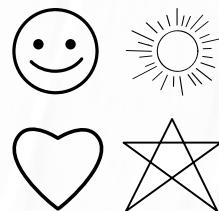
The answer is on page 66.

Write your own fun fact: \_\_\_\_\_

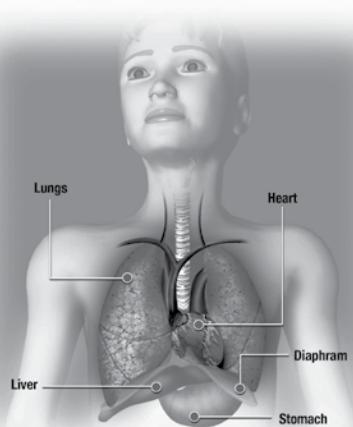
## Breathe Deeply!

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.




The lungs supply oxygen to your body.



Every day you breathe about 25,000 times.

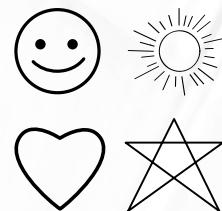
*The answer is on page 66.*

Name \_\_\_\_\_

## Flex That Muscle

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



	Heart	Smiley Face
Heart		Sun
	Star	Sun
	Sun	

Your muscles make you strong.



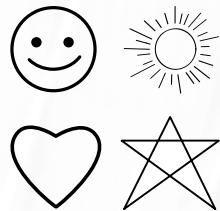
You have more than 600 muscles in your body.

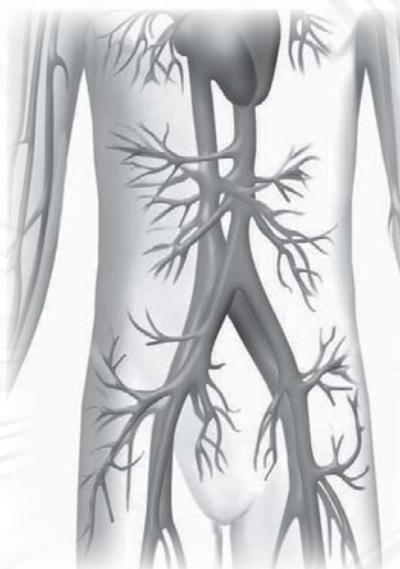
The answer is on page 66.

## Moving Blood

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



The answer is on page 66.

### Guess the Picture

What is this picture? \_\_\_\_\_

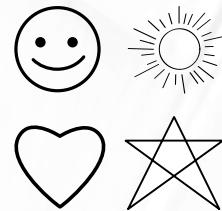
Write a caption: \_\_\_\_\_  
\_\_\_\_\_

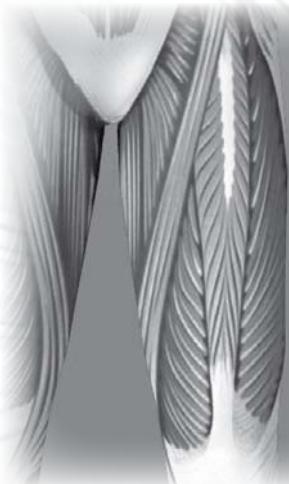
Name \_\_\_\_\_

## Making You Strong

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.



The answer is on page 66.

### Guess the Picture

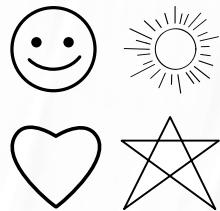
What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_  
\_\_\_\_\_

## Strolling Along

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.






The answer is on page 67.

### Guess the Picture

What is this picture? \_\_\_\_\_

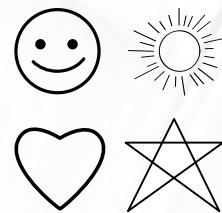
Write a caption: \_\_\_\_\_  
\_\_\_\_\_

Name \_\_\_\_\_

## Thinking About It

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.






The answer is on page 67.

### Guess the Picture

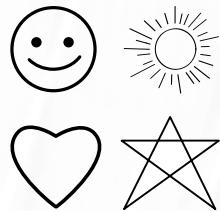
What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_

## Creaking Bones

### Directions

- Every mini-grid must have each shape.
- Every column must have each shape.
- Every row must have each shape.






The answer is on page 67.

### Guess the Picture

What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_  
\_\_\_\_\_

## **Measurement**



## Am I Sick?

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

1			2		
	2			1	
3					
	1				3

*The answer is on page 67.*



This girl's temperature is being taken with an ear thermometer.

Name \_\_\_\_\_

## Going Fast

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

4	2		1
1	3	4	2
3			4
	4	1	

The answer is on page 67.



A speedometer measures how fast a vehicle is traveling.

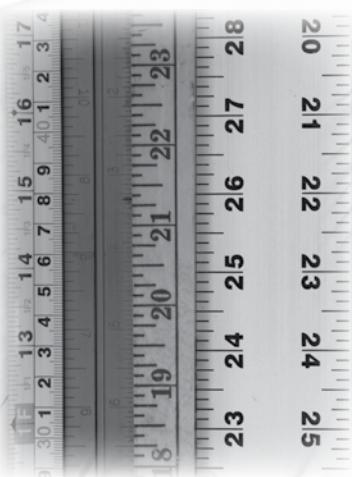
## Rulers Rule!

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

	2	
4		
		2
1		
		3

*The answer is on page 67.*



A ruler can be used to tell us the length of an item.

Name \_\_\_\_\_

## Getting Bigger

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

	3	1	
		2	
4			
	1	4	



A scale can be used to weigh ourselves.

The answer is on page 68.

## Beat the Clock!

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

	3		1	
1				4
2			4	

*The answer is on page 68.*



A stopwatch is used to time how fast a runner runs.

Name \_\_\_\_\_

## Look Out Below!

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

3			
	2		4
		1	
2			3

Geysers erupt  
when water hits  
the boiling point.



This is Old Faithful at Yellowstone National Park. It is called this because it erupts regularly.

*The answer is on page 68.*

**Vroom****Directions**

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

3			
	1		4
		2	
1			3

Race cars are built to go very fast around tracks.

*The answer is on page 68.*



The fastest speed of an Indianapolis 500 race was 185 miles per hour.

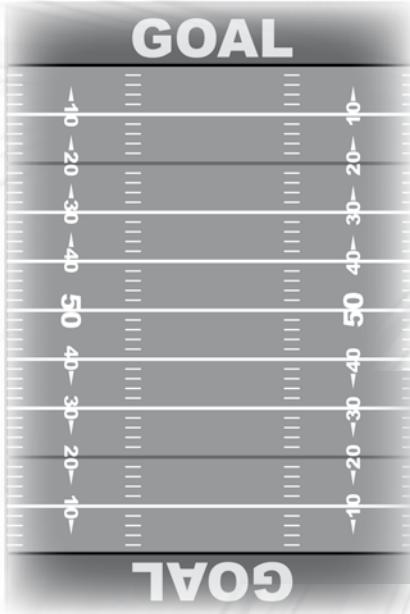
Name \_\_\_\_\_

## Yeah for the Home Team

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

Football fields are 100 yards long, marked in 10-yard sections.



	4		3
3		1	
2			4

The answer is on page 68.

Write your own fun fact: \_\_\_\_\_

## Baby Fat

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

1			
	2		
3			
	4		

During a doctor's appointment, a baby always gets weighed.



*The answer is on page 68.*

Write your own fun fact: \_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

## Ready! Set! Go!

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.

	2		
1		2	
	3		
		3	4

Runners win races by finishing in the shortest time.

*The answer is on page 69.*

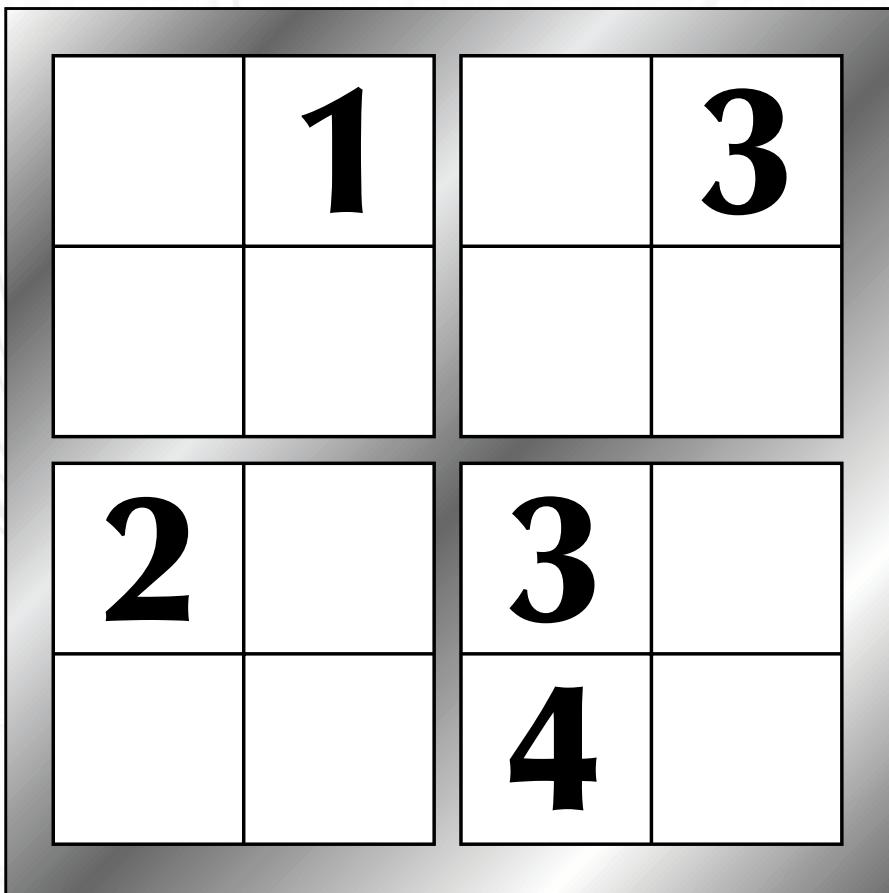
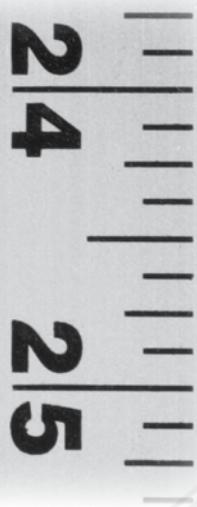


The world record for men running a marathon (26.22 miles) is 2 hours, 4 minutes, and 55 seconds.

## How Long Is It?

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.



*The answer is on page 69.*

### Guess the Picture

What is this picture? \_\_\_\_\_

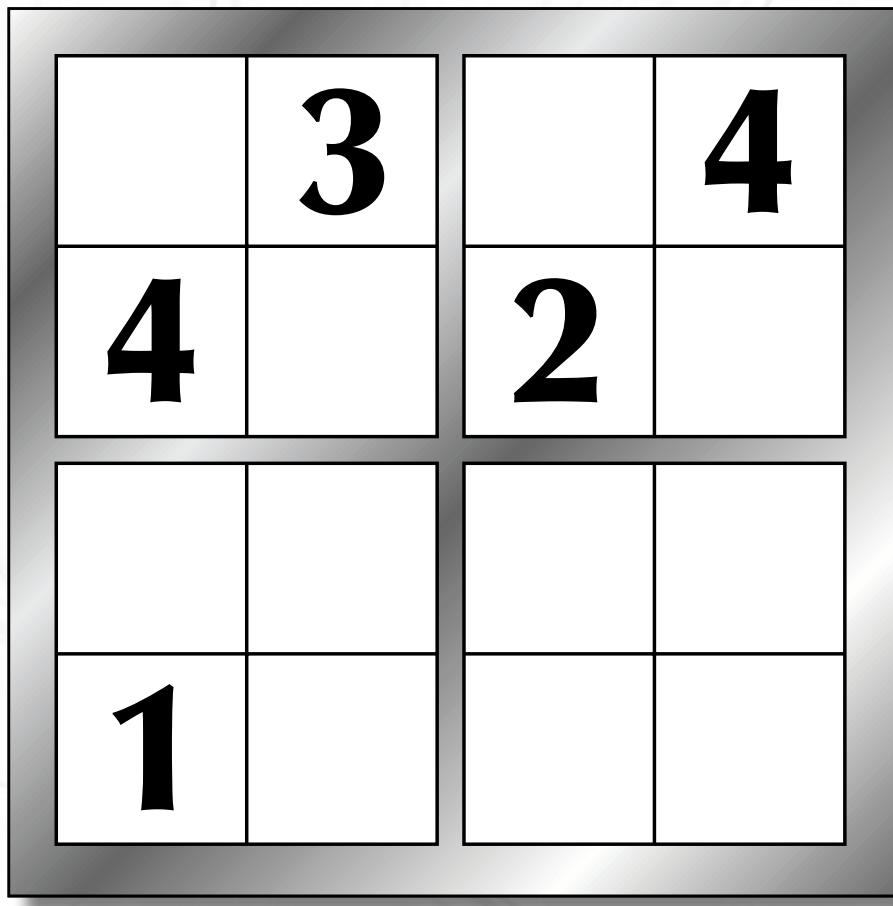
Write a caption: \_\_\_\_\_  
\_\_\_\_\_

Name \_\_\_\_\_

## Touchdown!

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.



The answer is on page 69.

### Guess the Picture

What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_

# Weighing In

## Directions

- Every mini-grid must have each of the numbers 1–4.
  - Every column must have each of the numbers 1–4.
  - Every row must have each of the numbers 1–4.



*The answer is on page 69.*

## Guess the Picture

What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_

Name \_\_\_\_\_

## Speeding Around

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.



3			4
	2		
		1	
			2

The answer is on page 69.

### Guess the Picture

What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_  
\_\_\_\_\_

## Feeling Warm?

### Directions

- Every mini-grid must have each of the numbers 1–4.
- Every column must have each of the numbers 1–4.
- Every row must have each of the numbers 1–4.



4	
	1
	1
	2
	3

*The answer is on page 69.*

### Guess the Picture

What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_  
\_\_\_\_\_

## **My World**



## Slurp, Slurp

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.

	B
A	C
D	
	B
C	

*The answer is on page 70.*



African animals in  
savannas drink from  
water holes.

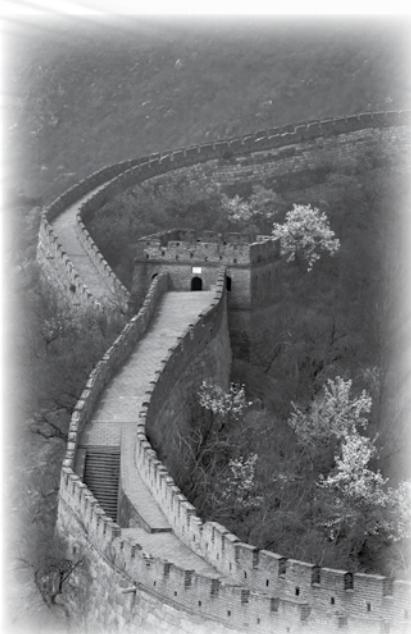
Name \_\_\_\_\_

## Longest Wall

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.

C			A
		C	
A		B	D

*The answer is on page 70.*

The Great Wall of China is the world's longest human-made structure.

## Lean Over

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.

		B
B		D
		D
	D	C

*The answer is on page 70.*



Italy's Leaning Tower of  
Pisa is over 800 years old.

Name \_\_\_\_\_

## Home Sweet Home

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.

			A
	C		
B	A		
			D

*The answer is on page 70.*

Machu Picchu in the Andes  
Mountains was the home  
of the Incas.

## Peek-a-Boo

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.

B		
	D	
		C
	A	

*The answer is on page 70.*



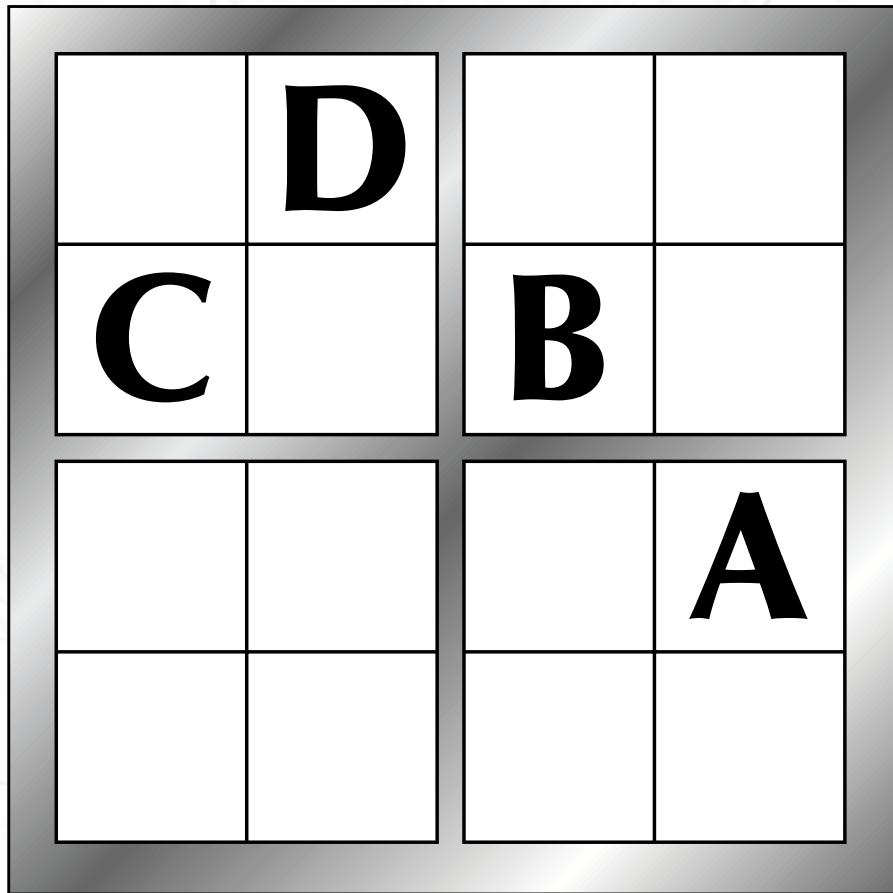
Two kangaroos pause for a moment. Look closely, one has a joey peeking out.

Name \_\_\_\_\_

## Humpy Ride

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.



Camels carry people  
across the Sahara  
Desert.



*The answer is on page 70.*

The Sahara covers one-third of Africa.  
That is about the size of the United  
States. It is the world's largest desert.

## Empress's Tomb

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.

A			
	B		
		D	
			C

India's Taj Mahal is one of the world's most beautiful buildings.



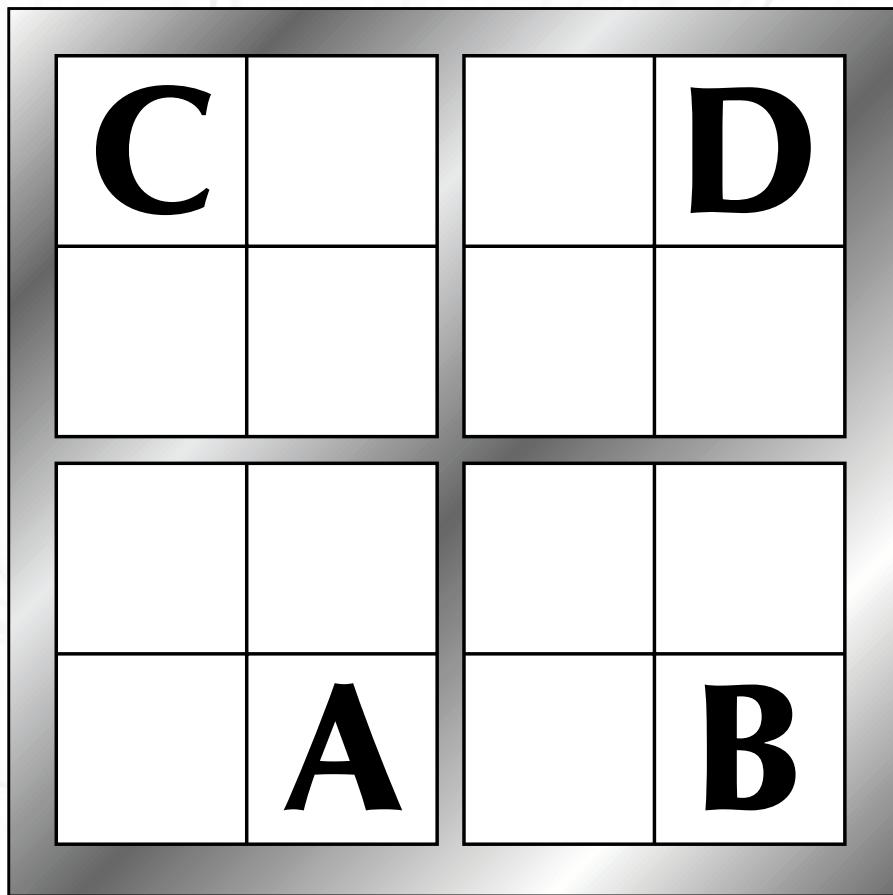
The Taj Mahal was built by an emperor in India to honor his wife.

*The answer is on page 71.*

# A Long Way Up

# Directions

- Every mini-grid must have each of the letters A–D.
  - Every column must have each of the letters A–D.
  - Every row must have each of the letters A–D.



A total of 1,652 steps lead to the top of the Eiffel Tower.



*The answer is on page 71.*

The Eiffel Tower was built in 1889 for an exhibition. It was almost torn down in 1909.

## Rain Forest

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.

	B		
			A
C			D

Rain forests like this one are found in South America.



*The answer is on page 71.*

Write your own fun fact: \_\_\_\_\_

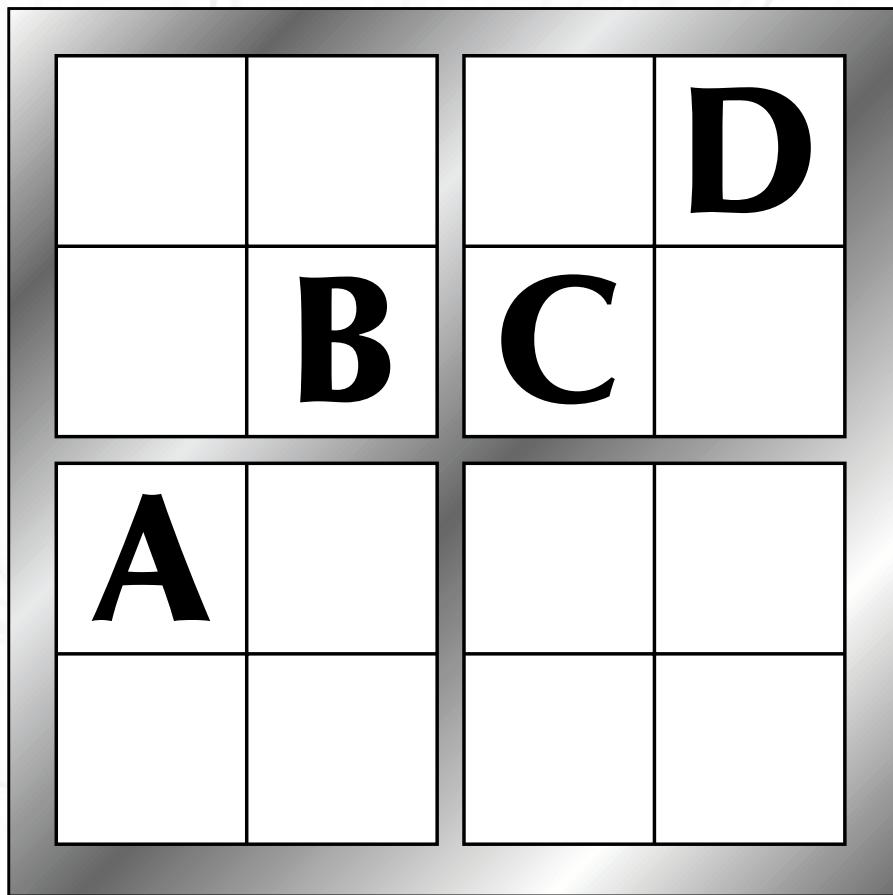
\_\_\_\_\_

Name \_\_\_\_\_

## Drivers, Be Careful!

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.



Road signs in Australia warn drivers about many animals.

*The answer is on page 71.*Write your own fun fact: \_\_\_\_\_  
\_\_\_\_\_

# Free Ride

## Directions

- Every mini-grid must have each of the letters A–D.
  - Every column must have each of the letters A–D.
  - Every row must have each of the letters A–D.



B			
		D	
	C		
A			

*The answer is on page 71.*

## Guess the Picture

What is this picture? \_\_\_\_\_

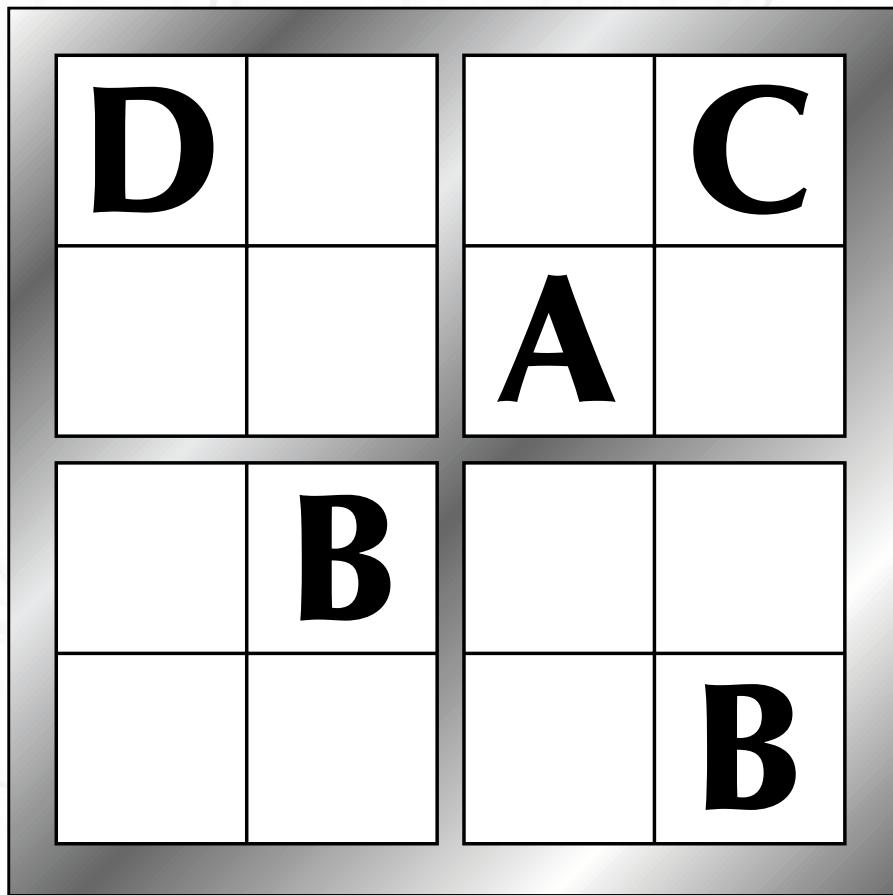
Write a caption: \_\_\_\_\_

Name \_\_\_\_\_

## Sandy Walk

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.

*The answer is on page 71.*

### Guess the Picture

What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_  
\_\_\_\_\_

## Tourist Attraction

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.



	C		
D			B
	D		

*The answer is on page 72.*

### Guess the Picture

What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_  
\_\_\_\_\_

Name \_\_\_\_\_

## Human-made Wall

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.



D		C	
	A		D
			B

*The answer is on page 72.*

### Guess the Picture

What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_  
\_\_\_\_\_

## Lush Leaves

### Directions

- Every mini-grid must have each of the letters A–D.
- Every column must have each of the letters A–D.
- Every row must have each of the letters A–D.



	C	
B		D
	D	A

*The answer is on page 72.*

### Guess the Picture

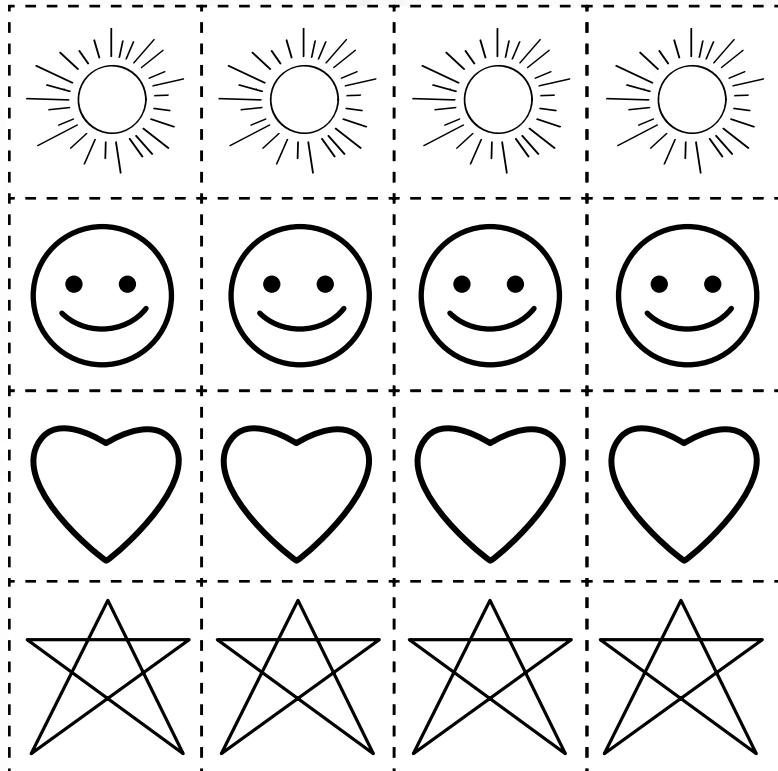
What is this picture? \_\_\_\_\_

Write a caption: \_\_\_\_\_  
\_\_\_\_\_

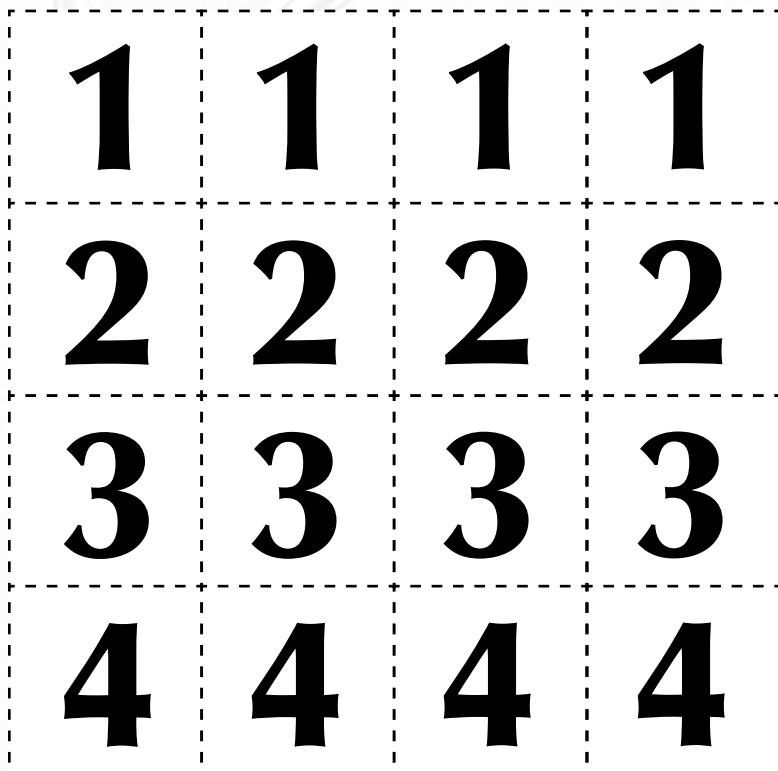
# **Templates**

## **Picture Cut Outs**

**Directions:** Cut out the boxes.



## **Easy Puzzles**



## **Number Cut Outs**

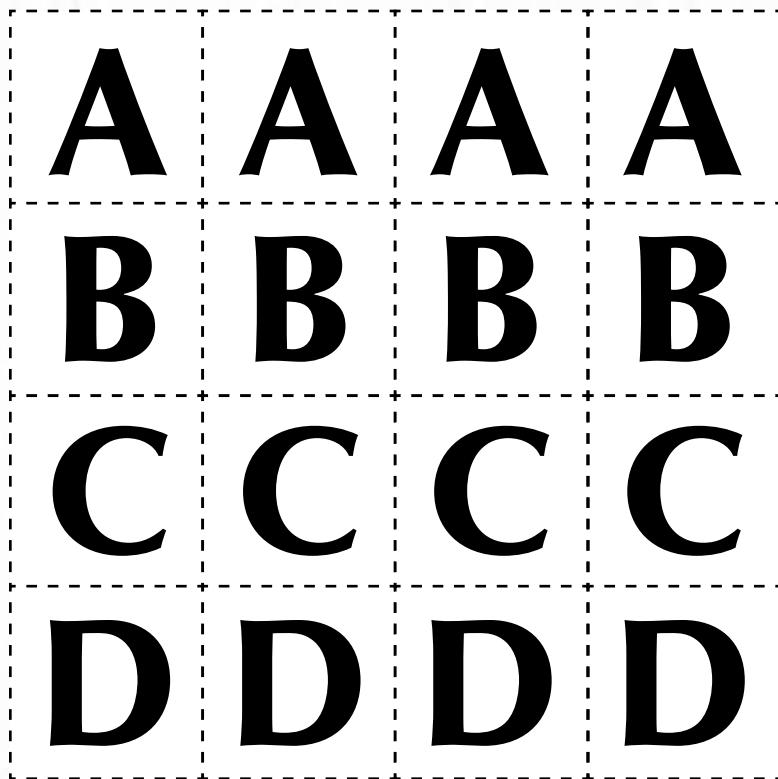
**Directions:** Cut out the boxes.

## **Medium Puzzles**

# Templates (cont.)

### Letter Cut Outs

**Directions:** Cut out the boxes.



### Hard Puzzles

### Puzzle Blocker 1

**Directions:** Cut out the puzzle blocker.

### For Easy, Medium, and Hard Puzzles

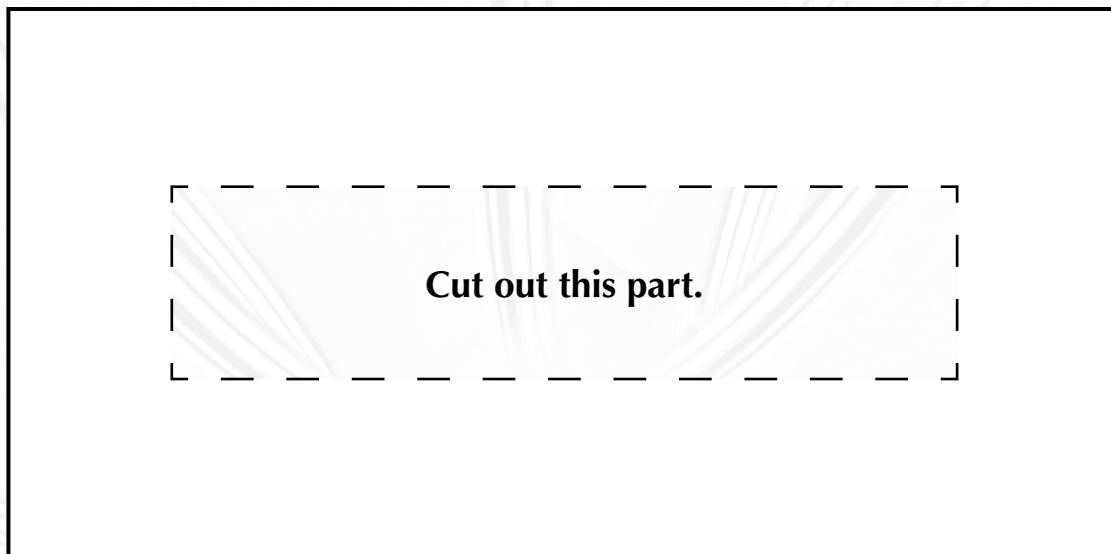


## **Templates** (cont.)

### **Puzzle Blocker 2**

**Directions:** Cut out the big rectangle. Then make a window by cutting along the dotted line.

#### **For Medium and Hard Puzzles**

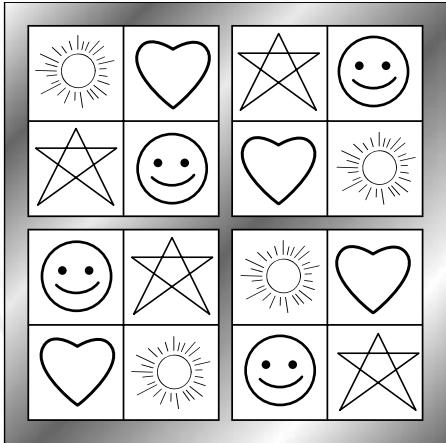


# Photograph Sources

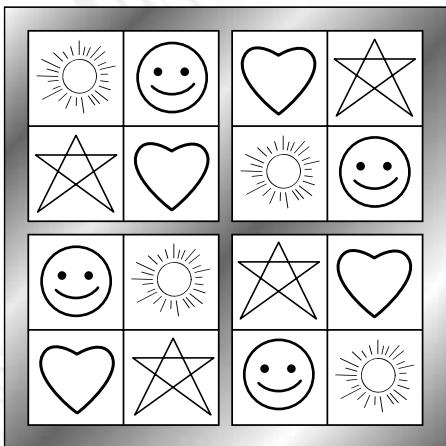
Page	Puzzle Title	Photograph Source
14	Muscles of the Body	Rick Nease
15	Inside Your Head	Tissuepix/Photo Researchers Inc.
16	X-ray Vision	Chen Wei Seng/Shutterstock, Inc.
17	Long Strides	Galina Barskaya/Shutterstock, Inc.
18	On the Boardwalk	Clint Scholz/Shutterstock, Inc.
19	Bones! Bones!	Roger Harris/Photo Researchers Inc.
20	Thump, Thump	Rick Nease
21	Pumping System	Rick Nease
22	Breathe Deeply!	Rick Nease
23	Flex That Muscle	Tomasz Trojanowski/Shutterstock, Inc.
24	Moving Blood	Rick Nease
25	Making You Strong	Rick Nease
26	Strolling Along	Clint Scholz/Shutterstock, Inc.
27	Thinking About It	Volker Steger/Photo Researchers Inc.
28	Creaking Bones	Roger Harris/Photo Researchers Inc.
30	Am I Sick?	Thomas M. Perkins/Shutterstock, Inc.
31	Going Fast	Sergey Ivanov/Shutterstock, Inc.
32	Rulers Rule!	C. Docken/Shutterstock, Inc.
33	Getting Bigger	Lev Olkha/Shutterstock, Inc.
34	Beat the Clock!	Pam Burley/Shutterstock, Inc.
35	Look Out Below!	Lukas Hejtmajer/Shutterstock, Inc.
36	Vroom	Rafa Irusta/Shutterstock, Inc.
37	Yeah for the Home Team	Miguel Angel Salinas Salinas/Shutterstock, Inc.
38	Baby Fat	Crystal Kirk/Shutterstock, Inc.
39	Ready! Set! Go!	Karin Lau/Shutterstock, Inc.
40	How Long Is It?	C. Docken/Shutterstock, Inc.
41	Touchdown!	Miguel Angel Salinas Salinas/Shutterstock, Inc.
42	Weighing In	Lev Olkha/Shutterstock, Inc.
43	Speeding Around	felixfotografia.es/Shutterstock, Inc.
44	Feeling Warm?	Radkevich Siarhei/Shutterstock, Inc.
46	Slurp, Slurp	Fernando Rodrigues/Shutterstock, Inc.
47	Longest Wall	Michel Stevelmans/Shutterstock, Inc.
48	Lean Over	Sandy Maya Matzen/Shutterstock, Inc.
49	Home Sweet Home	Vladimir Korostyshevskiy/Shutterstock, Inc.
50	Peek-a-Boo	WizData, Inc./Shutterstock, Inc.
51	Humpy Ride	Seleznev Oleg/Shutterstock, Inc.
52	Empress's Tomb	Vera Bogaerts/Shutterstock, Inc.
53	A Long Way Up	Dvoretskiy Igor Vladimirovich/Shutterstock, Inc.
54	Rain Forest	Anne Kitzman/Shutterstock, Inc.
55	Drivers, Be Careful!	Stephen Finn/Shutterstock, Inc.
56	Free Ride	WizData, Inc./Shutterstock, Inc.
57	Sandy Walk	Seleznev Oleg/Shutterstock, Inc.
58	Tourist Attraction	Dvoretskiy Igor Vladimirovich/Shutterstock, Inc.
59	Human-made Wall	Tan Kian Khoon/Shutterstock, Inc.
60	Lush Leaves	Andre Nantel/Shutterstock, Inc.

# Answer Key

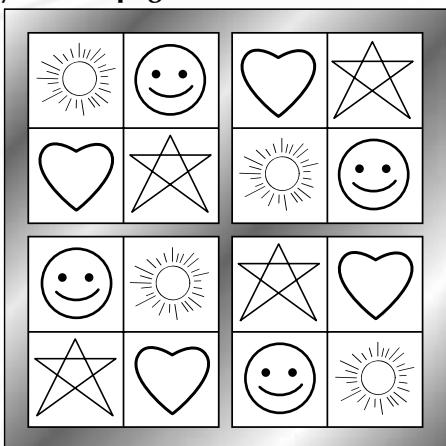
**Muscles of the Body (page 14)**



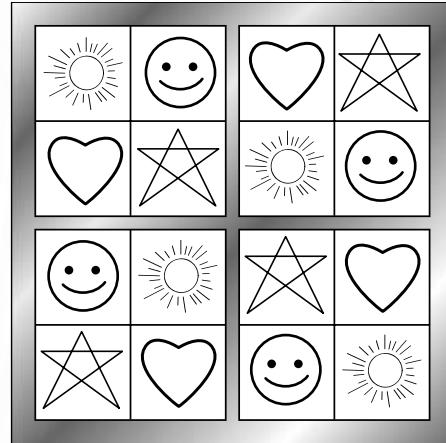
**Inside Your Head (page 15)**



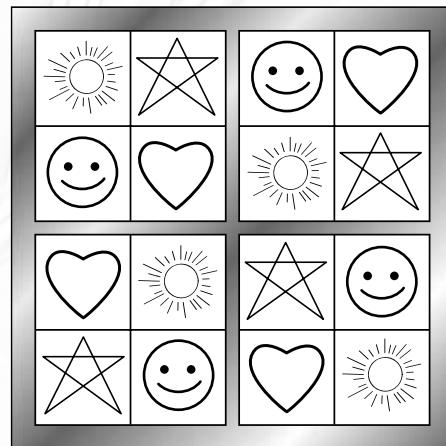
**X-ray Vision (page 16)**



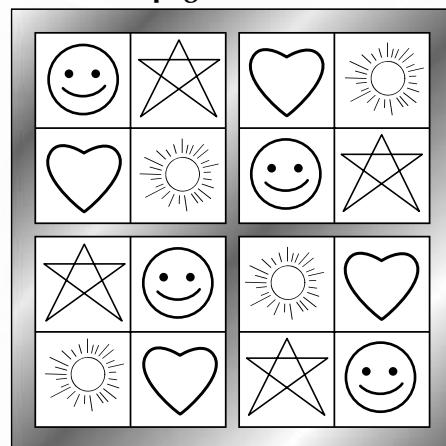
**Long Strides (page 17)**



**On the Boardwalk (page 18)**

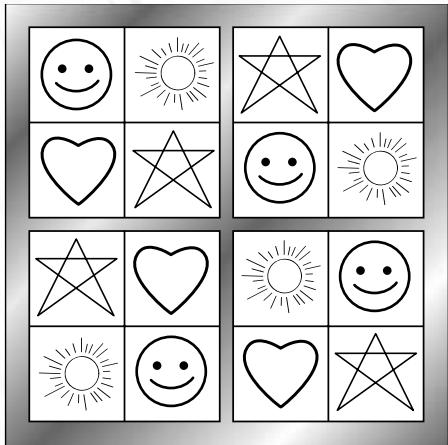


**Bones! Bones! (page 19)**

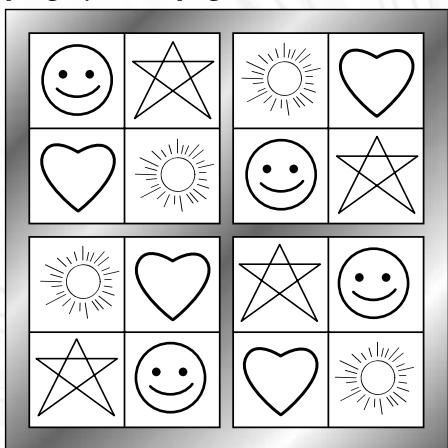


# Answer Key (cont.)

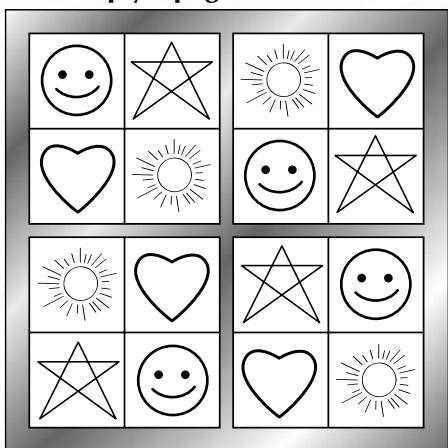
**Thump, Thump** (page 20)



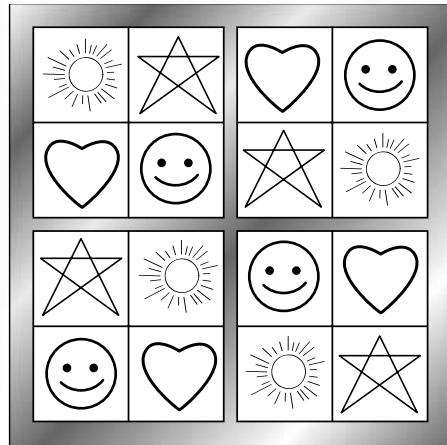
**Pumping System** (page 21)



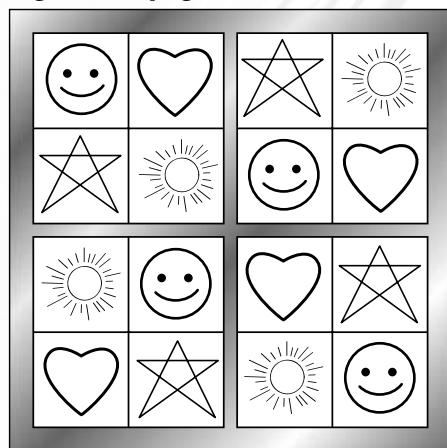
**Breathe Deeply!** (page 22)



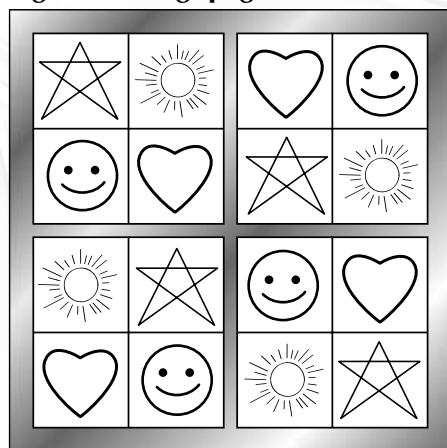
**Flex That Muscle** (page 23)



**Moving Blood** (page 24)

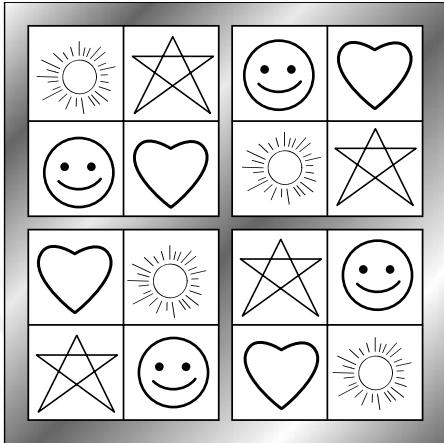


**Making You Strong** (page 25)

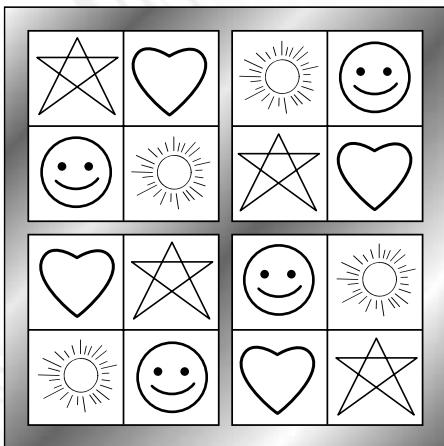


# **Answer Key** (cont.)

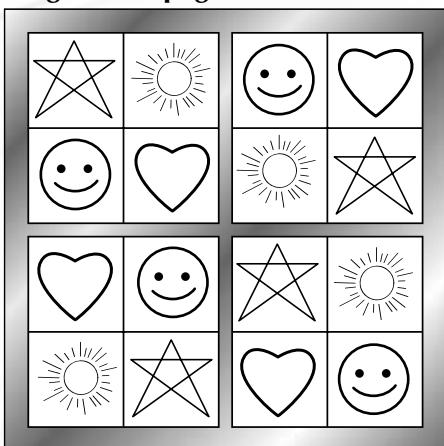
**Strolling Along** (page 26)



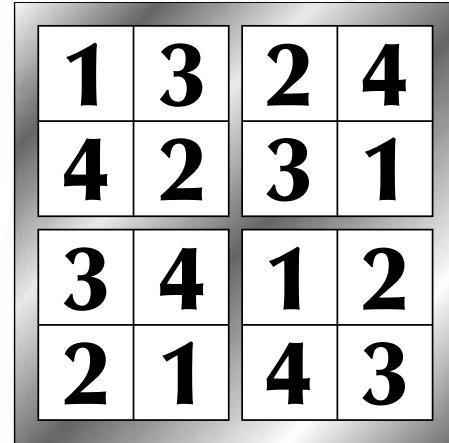
**Thinking About It** (page 27)



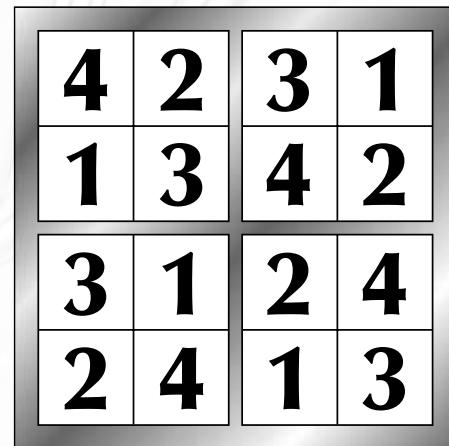
**Breaking Bones** (page 28)



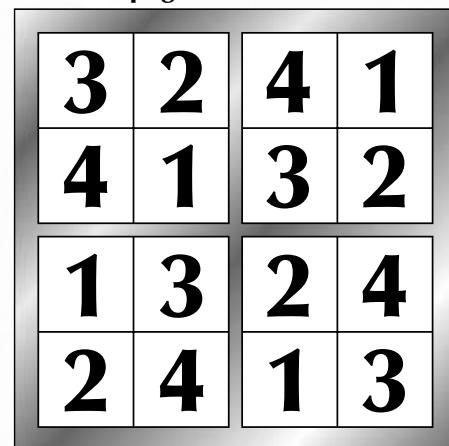
**Am I Sick?** (page 30)



**Going Fast** (page 31)



**Rulers Rule!** (page 32)



## **Answer Key** (cont.)

**Getting Bigger** (page 33)

2	3	1	4
1	4	2	3
4	2	3	1
3	1	4	2

**Beat the Clock!** (page 34)

4	3	1	2
1	2	3	4
3	4	2	1
2	1	4	3

**Look Out Below!** (page 35)

3	4	2	1
1	2	3	4
4	3	1	2
2	1	4	3

**Vroom** (page 36)

3	4	1	2
2	1	3	4
4	3	2	1
1	2	4	3

**Yeah for the Home Team** (page 37)

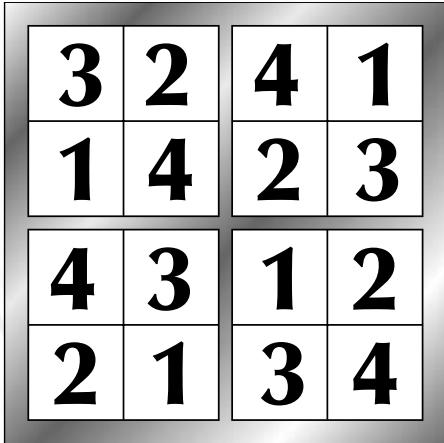
1	4	2	3
3	2	1	4
4	1	3	2
2	3	4	1

**Baby Fat** (page 38)

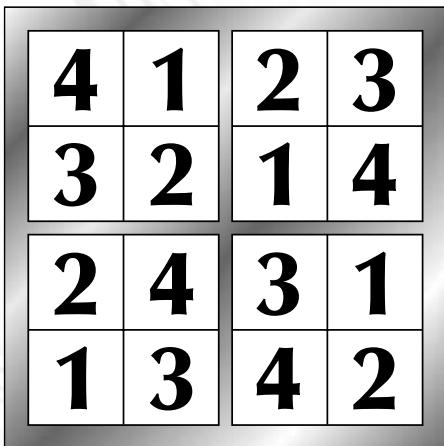
1	3	2	4
4	2	3	1
3	4	1	2
2	1	4	3

# **Answer Key** (cont.)

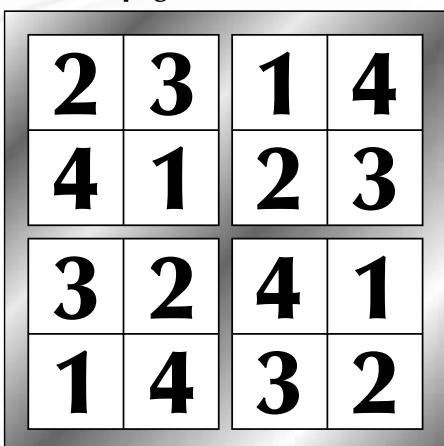
**Ready! Set! Go!** (page 39)



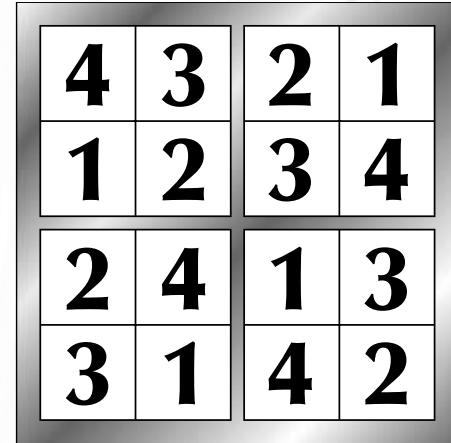
**How Long Is It?** (page 40)



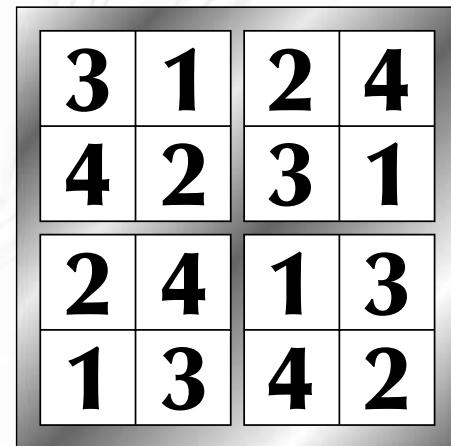
**Touchdown!** (page 41)



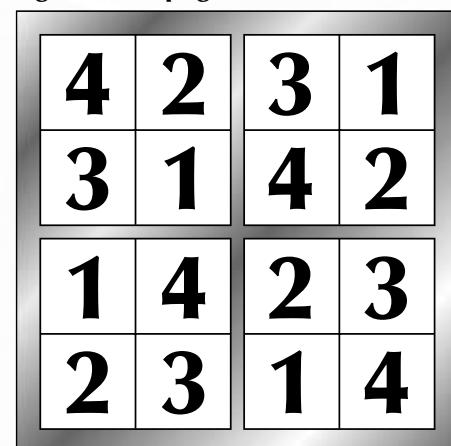
**Weighing In** (page 42)



**Speeding Around** (page 43)

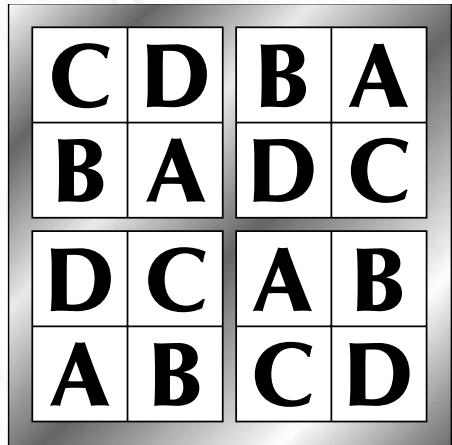


**Feeling Warm?** (page 44)

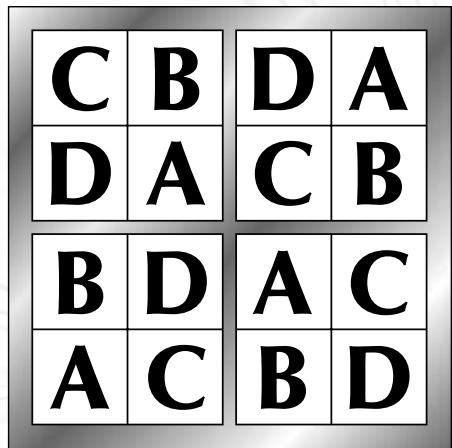


# Answer Key (cont.)

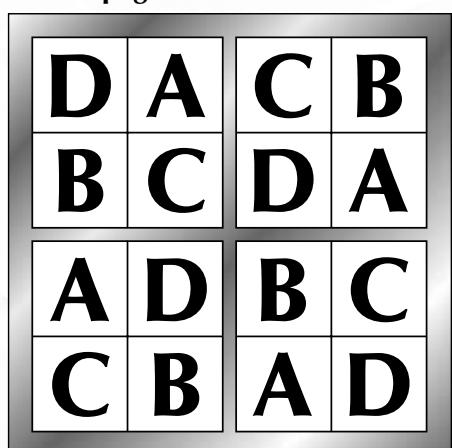
Slurp, Slurp (page 46)



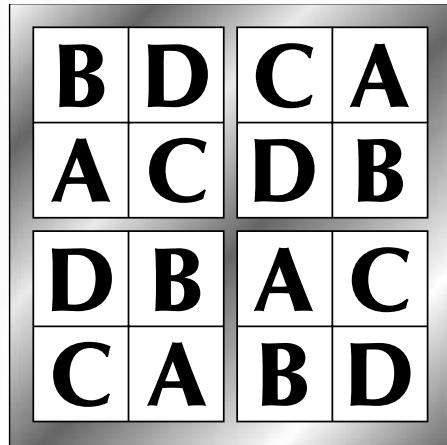
Longest Wall (page 47)



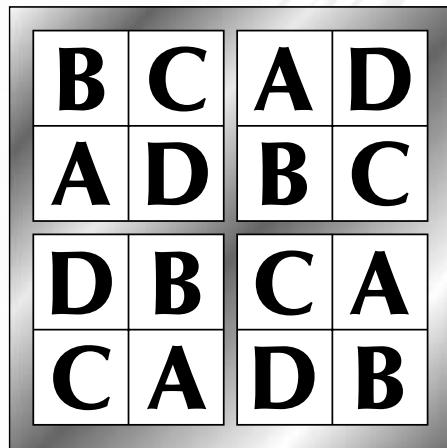
Lean Over (page 48)



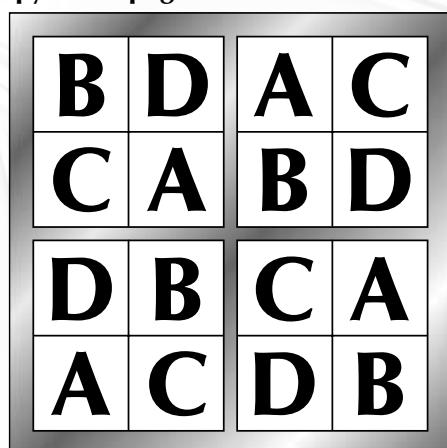
Home Sweet Home (page 49)



Peek-a-Boo (page 50)

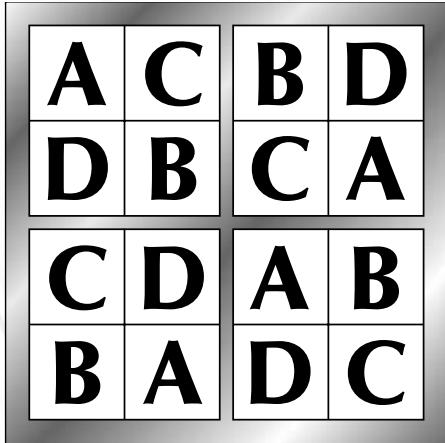


Humpy Ride (page 51)

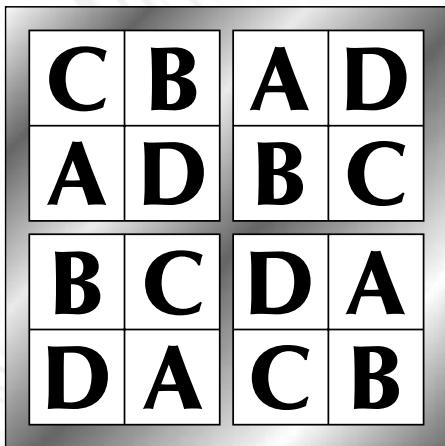


## **Answer Key** (cont.)

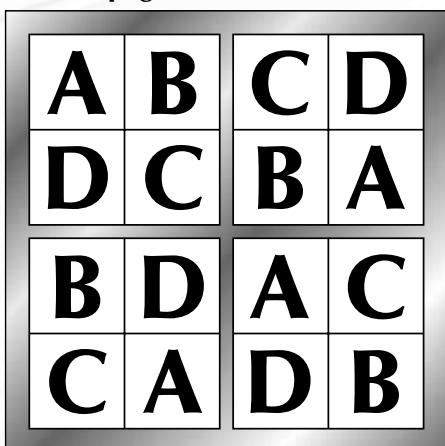
**Empress's Tomb** (page 52)



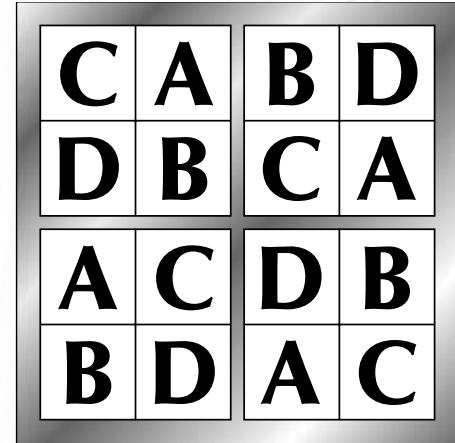
**A Long Way Up** (page 53)



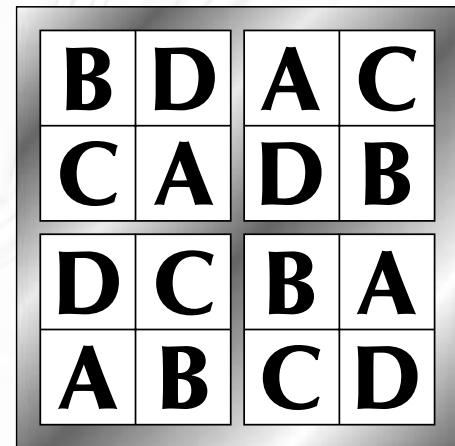
**Rain Forest** (page 54)



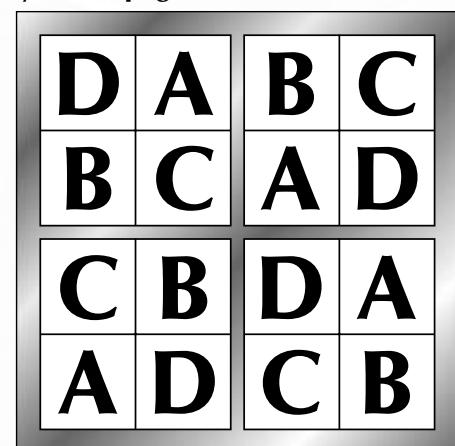
**Drivers, Be Careful!** (page 55)



**Free Ride** (page 56)

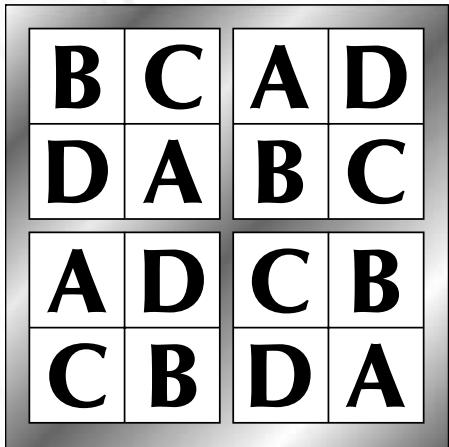


**Sandy Walk** (page 57)

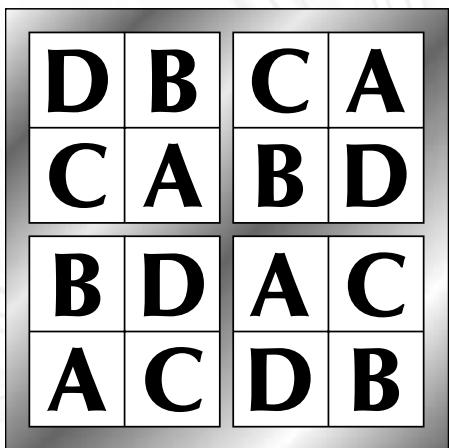


# Answer Key (cont.)

Tourist Attraction (page 58)



Human-made Wall (page 59)



Lush Leaves (page 60)

