



In Motion!

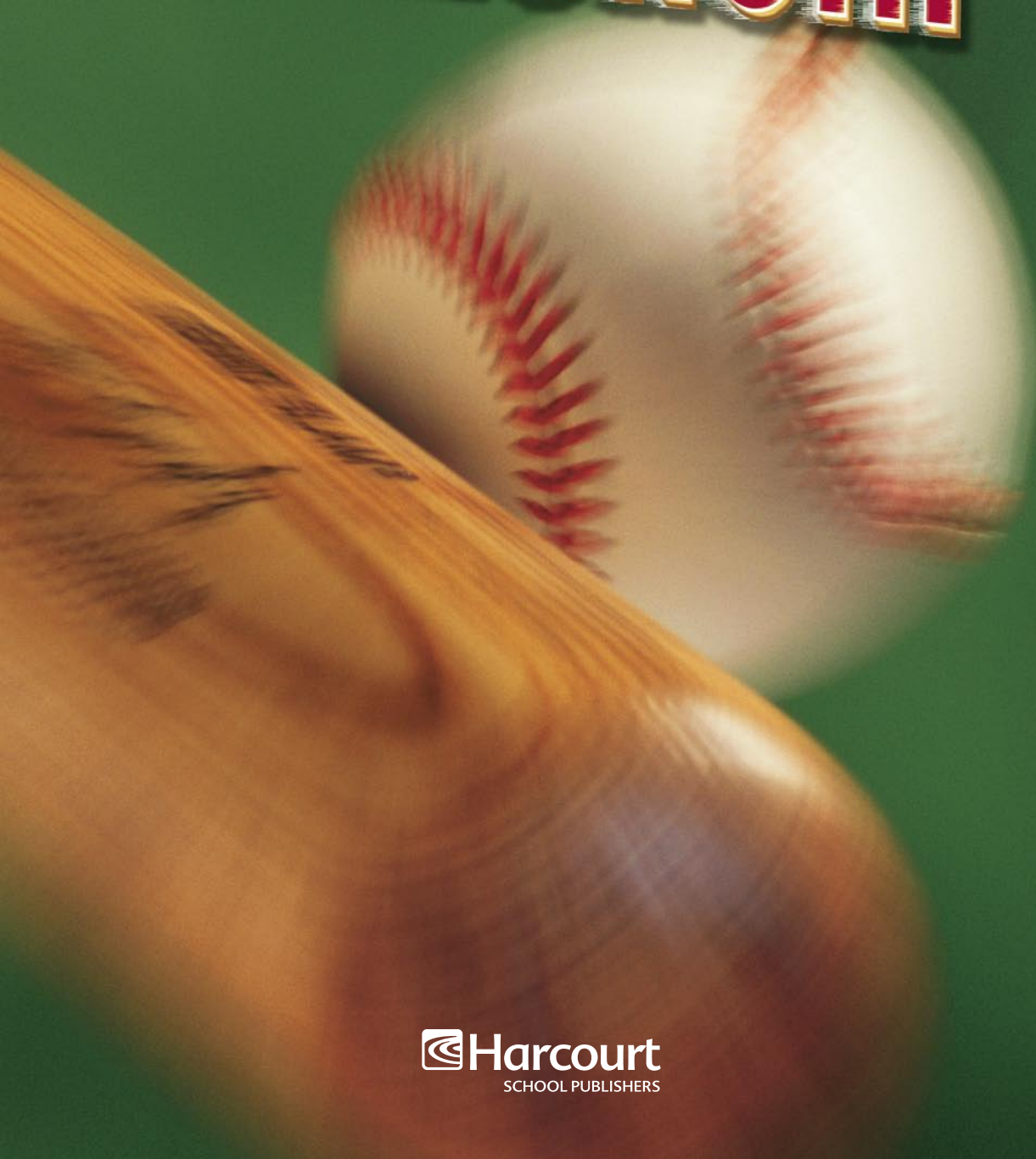


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Printed in the United States of America

ISBN 0-15-343910-6

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SCHOOL PUBLISHERS

Orlando Austin New York San Diego Toronto London

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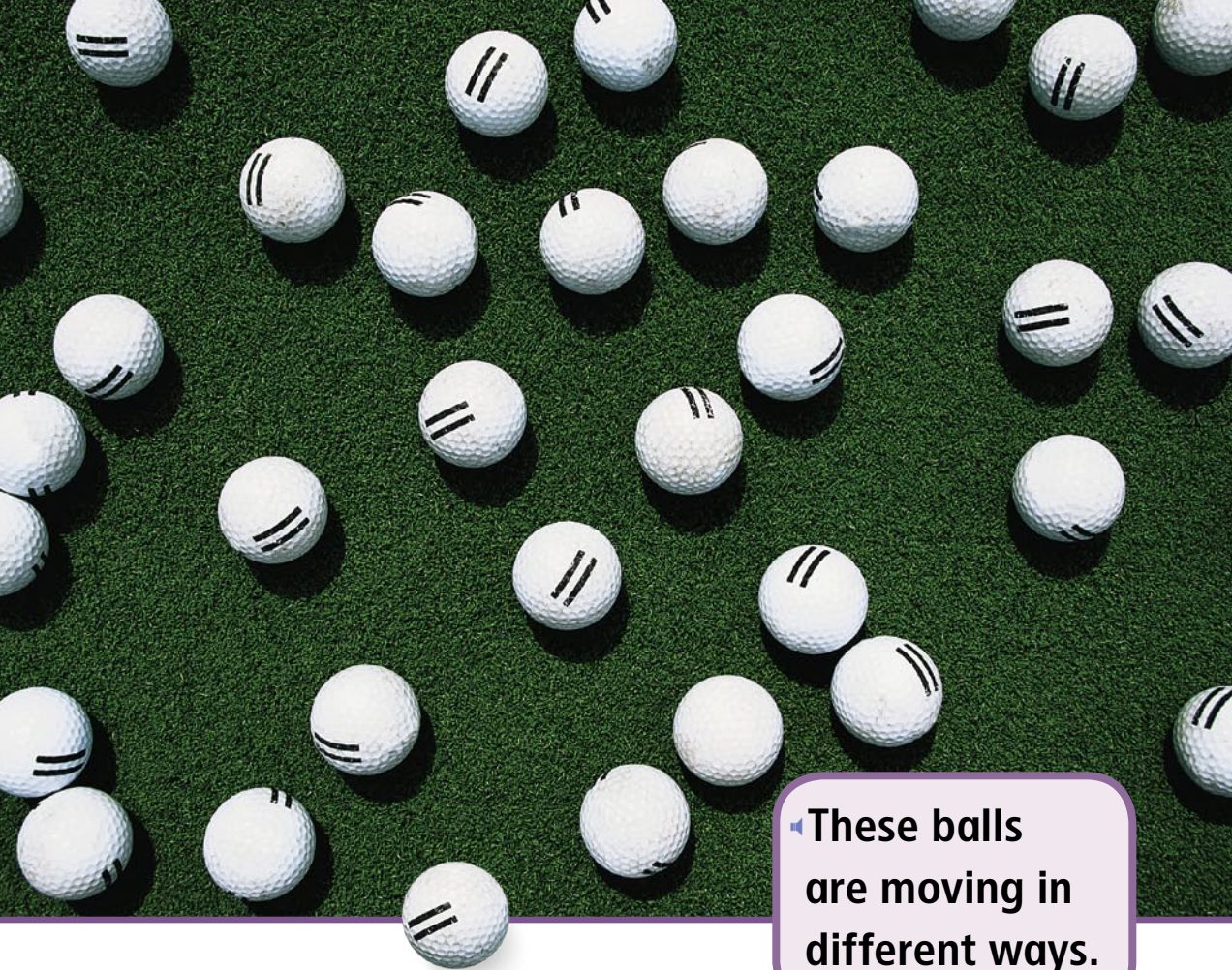
▸ Motion

Do you have a ball at home?
Is it hard to make the ball stand still?

Balls move a lot. A ball
is in **motion** when
it is moving.

▸ This ball is
in motion.





▸ These balls are moving in different ways.

▸ Things move in many ways. A ball can move up or down. It can move in a straight path. It can move in a curved path. It can even move in a circle.

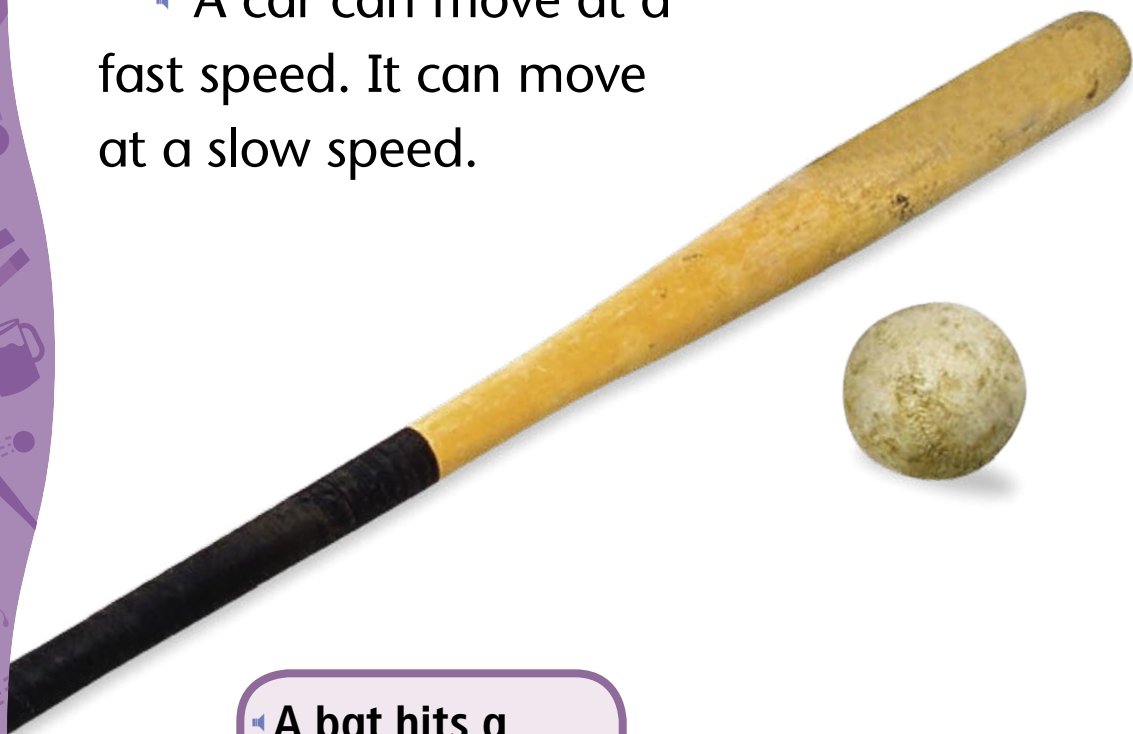


COMPARE AND CONTRAST Compare a ball in motion with a ball that stands still.

Speed

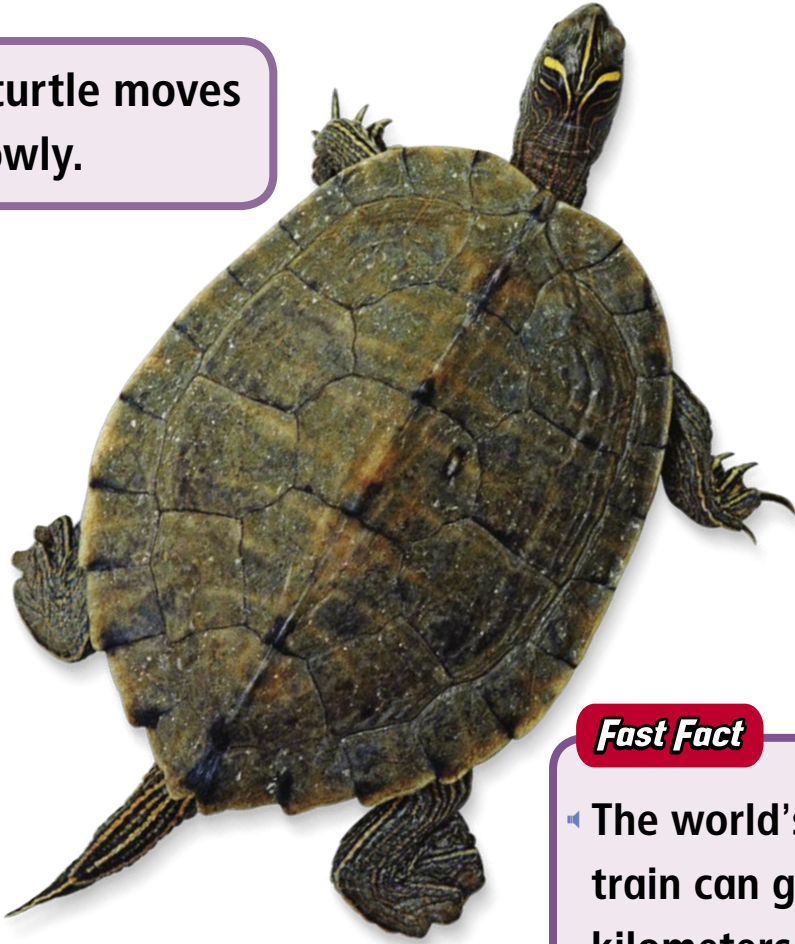
Speed is how fast something moves. A ball can move at a slow speed. A ball can move at a fast speed.

▀ A car can move at a fast speed. It can move at a slow speed.



▀ A bat hits a baseball. The ball goes fast.

▶ A turtle moves slowly.



Fast Fact

▶ The world's fastest train can go 518 kilometers per hour.

▶ Planes and trains move at very fast speeds. They move faster than cars.


Some animals move at fast speeds. Other animals move at slow speeds.



COMPARE AND CONTRAST Which moves faster, a car or a plane?

Force

A **force** makes something move or stop moving. You use force to throw a ball. You use force to catch a ball. The force of your hands makes the ball stop moving.



The force of the racquet makes the ball move.



▸ You use pushes and pulls to make a swing go back and forth.

▸ Pushes and pulls are forces. When you **push** a swing, you move it away from you. When you **pull** a swing, you bring it close to you.



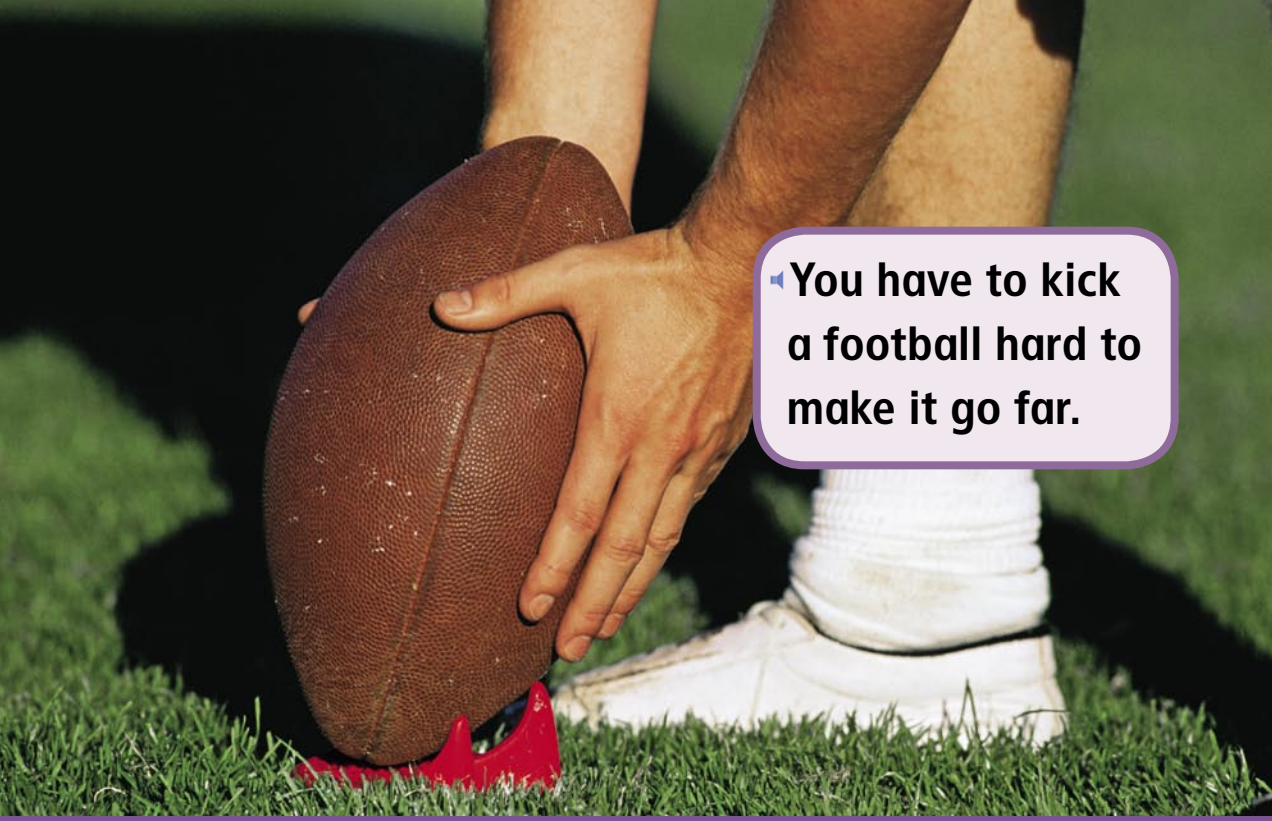
▸ **CAUSE AND EFFECT** What happens when you pull an object?

▶ **Force and Change**

Force can change the speed of an object. A ball can roll slowly away from you. It will go faster if you push it.



▶ A push by the wind can make these balloons go faster.



▶ You have to kick a football hard to make it go far.

▶ Force can change the direction of an object. The ball moves toward you. Then you hit it. It moves away.

▶ **Fast Fact**

The fastest speed of a baseball was over 160 kilometers per hour.

▶ Hit a ball hard. It moves fast and far.
Hit a ball gently. It moves slowly.
It does not go far.




CAUSE AND EFFECT What happens to a ball when you hit it gently?


Pulling Down

Gravity is a force that pulls objects to the ground. It makes objects fall unless a force is holding them up. Gravity pulls you down. It makes skiing fun.

 **MAIN IDEA AND DETAILS** Why do objects fall to the ground?



Gravity helps move this skier down the mountain.



▶ Gravity pulls these coins down.


▶ Summary

Force makes objects move or stop moving. Force makes things move faster or more slowly. Force can make things change direction. Pushes and pulls are forces. Gravity is a force that pulls things to the ground.

▸ **Glossary**

- **force** Something that makes an object move or stop moving (6, 7, 8, 9, 10, 11)
- **gravity** A force that pulls things down to the ground (10, 11)
- **motion** When something is moving. Things are in motion when they move. (2, 3)
- **pull** A force you use to tug an object closer to you (7, 10, 11)
- **push** A force you use to press an object away from you (7, 8, 11)
- **speed** The measure of how fast something moves (4, 5, 8)

▶ **Think and Write**

- ▶ **1.** Tell what you know about motion.
- ▶ **2. COMPARE AND CONTRAST**
Compare three ways a ball moves.
- ▶ **3. CAUSE AND EFFECT**
What causes an object to change direction?
- ▶  **4.** Write a letter to a friend about motion.

▶ **Hands-On Activity**

Work with a partner. Make a list of motions you see in the classroom.

▶ **School-Home Connection**

Make a list of ten things that can be pushed or pulled in your house.