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By Olivia Mendoza

Have you heard the story of Sir Isaac Newton and the apple? It tells that he was sitting under a tree one day. Then—SMACK! An apple hit his head. That made him think of the theory of gravity.

That's only partly true. The apple likely did not hit his head. Falling apples did make Newton think about gravity, though. It

also made him think about how objects move and how forces act on them. In 1687, he published a book that shaped modern physics. He described three laws of motion in it.

The First Law of Motion

Newton's first law is about inertia (ih-NER-shuh). Inertia describes how an object stays as

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it is until a force acts upon it. This means an object at rest stays at rest. For example, a ball on a shelf won't move by itself. Inertia also means an object will keep moving at the same speed and in the same direction. That is, until another force acts on it. For example, a ball would roll forever if a force called friction didn't slow it. Or if an object in its path didn't push back against it. The ball would also roll straight



descendant of Sir Isaac Newton's apple tree located in Cambridge, England



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speed and direction. First, an object moves in the direction the force acting on it moves. Second, the greater the force used, the greater the object's acceleration. Third, the more mass an object has, the more force it takes to accelerate. Imagine pushing a marble and bowling ball forward with the same force. They will both move forward. But the bowling ball won't go as fast or as far. It has more mass. That also

Did you know the shelf pushes up just as strongly? If the shelf didn't push back or pushed weakly, the ball might fall through it. If it pushed back **more** strongly, the ball might bounce up. If the shelf didn't push in the opposite direction, the ball would slide! Newton's third law explains that forces always come in pairs. For every action force, there is an equal and opposite reaction force.

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The Laws of Motion

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1. Which definition of **law** is used in this passage?
 - a. a rule you will be punished for not following
 - b. the way people should act
 - c. a person or group with power and control
 - d. a description of something that always happens
2. What was the author's main purpose?
 - a. to explain how modern physics works
 - b. to summarize Newton's three laws of motion
 - c. to show that Newton was the most important physicist



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4. Pretend an astronaut in the middle of outer space throws a rock. How will the rock move?

Law: _____

5. A semitruck and a car are going the same speed. To stop by a certain place, the semitruck must start braking sooner. Why?

Law: _____

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The Laws of Motion



The scrambled words below are vocabulary words from the passage. Unscramble each word and write it on the line. Please be sure each word is spelled correctly.

1. _____ q u a l e
clue: the same

2. _____ c r i f o n t i
clue: force that goes against motion



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6. _____ c a l e c a t e e r
clue: to change speed or direction

7. _____ c o f e r
clue: any kind of push or pull

8. _____ s a m s
clue: amount of matter in an object

9. _____ n i t o o m
clue: a change in position; movement

10. _____ h y p c i s s
clue: study of matter, energy, and force

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The Laws of Motion

In the passage, "The Laws of Motion," you read about Newton's three laws.

On the lines below, give three examples of things you have recently done or seen that show the laws of motion. Use a different example for each law. Be sure to clearly explain how each example relates to that specific law of motion.

A cartoon superhero with brown hair, wearing a blue suit with a red cape and a shield-shaped emblem on his chest with the letters 'MJS'. He is flying through a blue sky with white clouds.

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