



ZAC NEWTON INVESTIGATES

Fabulous Forces

Zac and friends learn about forces and motion through visits with Sir Isaac Newton, the Wright Brothers, Robert Goddard, Archimedes, and Galileo.

What did you learn?

QUESTIONS

1. The way air flows around an object is part of a study called what?
 - a. Aerodynamics
 - b. Chemistry
 - c. Astronomy
 - d. Meteorology
2. Dr. Robert H. Goddard pioneered experiments in which field of study?
 - a. Biology
 - b. Physiology
 - c. Rocketry
 - d. Astronomy
3. Which scientist believed that, if two objects were dropped from the same height, the heavier one would fall faster?
 - a. Galileo
 - b. Wilbur Wright
 - c. Isaac Newton
 - d. Aristotle
4. Which part did the kids forget to include in their cart?
 - a. Pedals
 - b. Chainring
 - c. Sprockets
 - d. Brakes
5. Can you explain why a boxy shape is not very aerodynamic?
6. Can you explain how a rocket shoots into the air?

TRUE OR FALSE?

- | | | | |
|-------|---|-------|--|
| _____ | 1. A scientific law tells people how to behave. | _____ | 4. Simon Stevin promoted the use of decimal fractions. |
| _____ | 2. Sir Isaac Newton tested his plane near Kitty Hawk, North Carolina. | _____ | 5. Archimedes was the first person to observe the moons of Jupiter. |
| _____ | 3. The effect of a force on an object depends on the object's speed. | _____ | 6. Friction is the resistance between two objects that rub against each other. |

ANSWERS

- 1. a. Aerodynamics.** According to page 27, we know that, "The way air flows around something is part of a science called aerodynamics." So, the correct answer is A.
- 2. c. Rocketry.** According to pages 46 and 47, we know that, "Dr. Goddard did pioneering experiments in rocketry during the early 1900's." So, the correct answer is C.
- 3. d. Aristotle.** According to page 70, we know that, "Aristotle thought that if two objects were dropped from the same height, the heavier one would fall faster." So, the correct answer is D.
- 4. d. Brakes.** According to page 81, we know Zac cries, "I forgot to give the cart brakes!" So, the correct answer is D.
- 5.** According to pages 28, we know that, "The air pushes hard against this flat front surface, and it cannot flow smoothly around all these corners."
- 6.** According to page 47, we know that, "Basically, what happens inside my rocket is that fuel is combined with oxygen, causing a chemical reaction. This is a form of combustion ... The combustion produces exhaust gases, which are forced out of the rocket here. This pushes the rocket in the opposite direction."

TRUE OR FALSE? ANSWERS

- 1. False.** According to page 17, we know that, "No, a scientific law isn't like a law that tells people how to behave ... A scientific law just describes how something works." So, the correct answer is False.
- 2. False.** According to page 34, we know that, "I knew I'd heard the name *Kitty Hawk* before! This is where the Wright brothers tested their plane." So, the correct answer is False.
- 3. False.** According to page 62, we know that, "... the effect of a force on an object depends on the object's mass—basically how heavy it is." So, the correct answer is False.
- 4. True.** According to page 93, we know that Simon Stevin "is best known for developing and promoting the use of decimal fractions." So, the correct answer is True.
- 5. False.** According to page 93, we know Galileo "was the first person to observe the moons of Jupiter." So, the correct answer is False.
- 6. True.** According to page 94, we know that, "friction: the resistance between two objects that rub against each other." So, the correct answer is True.