

Chapter 12 Forces and Motion

Section 12.2 Newton’s First and Second Laws of Motion

(pages 363–369)

This section discusses how force and mass affect acceleration. The acceleration due to gravity is defined, and mass and weight are compared.

Reading Strategy (page 363)

Building Vocabulary As you read this section, write a definition in the table for each vocabulary word you encounter. Use your own words in the definitions. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Matter and Motion	
Vocabulary	Definition
Inertia	

Aristotle, Galileo, and Newton (pages 363–364)

Match each scientist with his accomplishment.

- | Accomplishment | Scientist |
|--|--------------|
| _____ 1. Italian scientist who did experiments that helped correct misconceptions about force and motion | a. Aristotle |
| _____ 2. Scientist who studied in England and introduced several laws describing force and motion | b. Galileo |
| _____ 3. An ancient Greek philosopher who made many scientific discoveries through observation and logical reasoning | c. Newton |

Newton’s First Law of Motion (pages 364–365)

- Is the following sentence true or false? According to Newton’s first law of motion, an object’s state of motion does not change as long as the net force acting on it is zero. _____
- What is inertia? _____

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6. Is the following sentence true or false? The law of inertia states that an object in motion will eventually slow down and come to a complete stop if it travels far enough in the same direction.

Newton’s Second Law of Motion (pages 365–368)

7. According to Newton’s second law of motion, acceleration of an object depends upon the _____ of the object and the _____ acting on it.

Match each term with its description.

- | Description | Term |
|---|-----------------|
| _____ 8. A measure of the inertia of an object | a. mass |
| _____ 9. Net force/Mass | b. net force |
| _____ 10. Causes an object’s velocity to change | c. acceleration |
11. Is the following sentence true or false? The acceleration of an object is always in the same direction as the net force acting on the object. _____
12. Is the following sentence true or false? If the same force acts upon two objects with different masses, the acceleration will be greater for the object with greater mass. _____

Weight and Mass (pages 368–369)

13. What is weight? _____

14. Write the formula used to calculate the weight of an object.

15. Is the following sentence true or false? Because the weight formula shows that mass and weight are proportional, doubling the mass of an object will not affect its weight. _____
16. Complete the table below by describing the difference between mass and weight.

Mass and Weight	
Mass	Weight

17. On the moon, the acceleration due to gravity is only about one sixth that on Earth. Thus, an object will weigh _____ on the moon than it weighs on Earth.