

# Newton's Laws of Motion

## Chapter 14 Study Guide

### Section 1: Vocabulary

Write the word or words that make the statement correct.

1. When one object applies a force to a second object, that force is called the \_\_\_\_\_.

2. The name for the attractive force between the mass of Earth and the mass of objects on Earth is \_\_\_\_\_.

3. A moving object's \_\_\_\_\_ is how quickly its position is changing with time at any moment.

4. The tendency of an object to resist change in its state of motion is called the object's \_\_\_\_\_.

5. When all of the forces on an object cancel one another out, the forces are said to be \_\_\_\_\_.

6. The force that acts against moving objects is called \_\_\_\_\_.

7. The speed of a moving object together with its direction of travel gives the \_\_\_\_\_ of the object.

8. The pull of gravity on an object is called the object's \_\_\_\_\_.

9. A change in velocity is called \_\_\_\_\_.

10. A push or pull that acts on an object is a(n) \_\_\_\_\_.

### Vocabulary List

velocity

weight

acceleration

inertia

gravity

action

friction

force

balanced forces

speed

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### Section 2: Science Concepts

Circle the letter of the best answer.

11. Which equation shows how change in speed is related to force and mass?

- A.  $F = a/m$
- B.  $m = aF$
- C.  $a = m/F$
- D.  $a = F/m$

12. If a ball is rolling and there is not force acting on the ball, then \_\_\_\_\_

- A. the ball will stop.
- B. the ball will roll forever.
- C. the ball will slow down.
- D. the ball will speed up.

13. Which is true of a car moving at a constant speed in a constant direction?

- A. The forces acting on the car are balanced.
- B. There is a net force acting on the car.
- C. The forces acting on the car are unbalanced.
- D. none of the above

14. What would happen if you dropped a hammer and a feather at the same time on the Moon?

- A. The hammer and the feather wouldn't fall at all.
- B. The hammer would fall faster.
- C. The feather would fall faster.
- D. The hammer and the feather would fall at the same rate.

15. What happens between objects when one object exerts a force on another object?

- A. the second object feels the reaction force, the first object feels the action force.
- B. The second object feels the action force, the first object feels no force.
- C. The second object feels the action force, the first object feels the reaction force.
- D. The second object feels no force, the first object feels the reaction force.

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### Section 3: Science Process Skills

Circle the letter of the best answer.

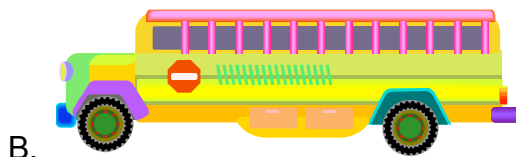
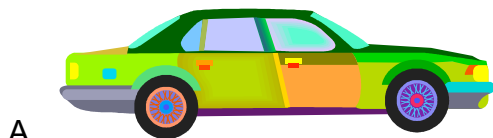
16. **Interpret Data** What city is at D11? *\*Note: Learn this skill, do not memorize this answer. The test's question will be somewhat different.*

- A. Huntsville
- B. Atlanta
- C. Nashville
- D. Knoxville

17. **Use Numbers** A 12-newton force is applied to a 3-kg object. What is the object's rate of acceleration? *\*Note: Learn this skill, do not memorize this answer. The test's question will be somewhat different.*

- A. 36 meters per second each second
- B. 4 meters per second each second
- C. 12 meters per second each second
- D. 3 meters per second each second

18. **Predict** If the same force is applied to each object, which object will travel the furthest? *\*Note: Learn this skill, do not memorize this answer. The test's question will be somewhat different.*



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### Section 4: Knowing Newton's Laws

Fill in the blanks to complete each of Newton's Laws.

Newton's First Law of Motion: Objects at rest remain at \_\_\_\_\_ and objects traveling at a steady \_\_\_\_\_ in a \_\_\_\_\_ line continue that way until a \_\_\_\_\_ acts on them.

Newton's Second Law of Motion: When an \_\_\_\_\_ force acts on an object, the object's acceleration equals the \_\_\_\_\_ divided by the object's \_\_\_\_\_.

Newton's Third Law of Motion: For every \_\_\_\_\_, there is an \_\_\_\_\_, but opposite \_\_\_\_\_.

Newton's Law of Universal Gravitation: The force of \_\_\_\_\_ between two objects increases with the \_\_\_\_\_ of the objects and decreases with the \_\_\_\_\_ between them squared.

**Word bank:** (Some words may be used more than once.)

mass      distance      action      reaction      gravity      unbalanced  
rest      straight      force      rate      equal

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## Chapter 14 Study Guide

### Section 5: Using Science Concepts

Answer each question using complete sentences.

19. While wearing roller blades, you push against a wall. Use Newton's third law of motion to explain what happens next.

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20. **Critical Thinking** Object A is pushed with a 5-newton force. Object B is pushed with a 10-newton force. Both objects move the same distance. Is the mass of Object B greater or less than the mass of Object A? Explain.

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