

Forces ▪ *Guided Reading and Study*

Friction and Gravity

This section describes the effects of friction on surfaces that rub on each other. It also describes how gravity acts between objects in the universe.

Use Target Reading Skills

Friction and gravity are both forces that affect motion. As you read the section, compare and contrast friction and gravity by completing the graphic organizer.

	Friction	Gravity
Effect on motion	Opposes motion	
Depends on		
Measured in		

Friction

1. Is the following sentence true or false? When two surfaces rub, the irregularities of one surface get caught on those of the other surface.

2. What is friction?

3. Friction acts in a direction _____ to the object's direction of motion.

4. The strength of the force of friction depends on what two factors?

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Friction and Gravity *(continued)*

5. How is friction involved in sledding and skiing?

6. Why does some friction occur with seemingly smooth surfaces?

7. Complete the following table about the different kinds of friction.

Kinds of Friction	
Kind of Friction	Friction Occurs When ...
	An object moves through a liquid or gas
	Solid surfaces slide over each other
	An object rolls over a surface
	Objects are not moving

8. Which kind of friction requires more force to overcome, rolling friction or sliding friction? _____

9. What kind of friction occurs when moving parts have ball bearings?

10. How does oil between machine parts reduce friction?

Name _____ Date _____ Class _____

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Friction and Gravity *(continued)*

Gravity

11. The force that pulls objects toward each other is called _____.
12. Is the following sentence true or false? The force that makes an apple fall to the ground is the same force that keeps Earth orbiting the sun.

13. What does the universal law of gravitation state?

14. The force of attraction between two objects varies with what two factors?

15. What is weight?

16. How is weight different from mass?

17. Weight is usually measured in _____.

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Gravity and Motion

18. Is the following sentence true or false? On the moon, your mass would be less than it is on Earth, but your weight would be the same.

19. When is an object said to be in free fall?

20. Near the surface of Earth, what is the acceleration of an object due to the force of gravity? _____
21. Objects falling through air experience a type of fluid friction called _____.
22. The greatest velocity a falling object reaches is called _____.
23. Is the following sentence true or false? The greater the surface area of an object, the greater the air resistance. _____
24. An object that is thrown is called a(n) _____.
25. Is the following sentence true or false? An object that is dropped will hit the ground before an object that is thrown horizontally from the same height. _____
26. On the diagram below, draw arrows that show the forces acting on the falling acorn. Label each arrow with the name of the force.

