

# Directed Reading A

## Section: What Is Matter?

### MATTER

- \_\_\_\_\_ 1. What unit would you use to measure the amount of water in a lake?
- a. grams (g)
  - b. liters (L)
  - c. meters (m)
  - d. milliliters (mL)

- \_\_\_\_\_ 2. What unit would you use to measure the volume of soda in a can?
- a. centimeters (cm)
  - b. grams (g)
  - c. liters (L)
  - d. milliliters (mL)

3. What characteristic do a human, hot soup, the metal wires in a toaster, and the glowing gases in a neon sign have in common?

- \_\_\_\_\_
4. What is matter?
- \_\_\_\_\_

### MATTER AND VOLUME

5. What is volume?
- \_\_\_\_\_

6. Things with \_\_\_\_\_ cannot share the same space at the same time.

7. To measure a volume of water in a graduated cylinder, you should look at the bottom of the curve at the surface of the water called the \_\_\_\_\_.

8. The volume of solid objects is commonly expressed in \_\_\_\_\_ units.

9. What three dimensions are needed to find the volume of a rectangular solid?
- \_\_\_\_\_

### VOLUME OF AN IRREGULARLY SHAPED SOLID OBJECT

10. How could the volume of a gold nugget be found using water and a graduated cylinder?
- \_\_\_\_\_

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**11.** Why can you express the volume of the gold nugget measured by this method in cubic units?

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**MATTER AND MASS**

\_\_\_\_\_ **12.** The amount of matter in an object is its  
**a.** volume. **c.** meniscus.  
**b.** length. **d.** mass.

\_\_\_\_\_ **13.** The SI unit of mass is the  
**a.** newton. **c.** kilogram.  
**b.** liter. **d.** pound.

\_\_\_\_\_ **14.** The SI unit of weight is the  
**a.** newton. **c.** kilogram.  
**b.** liter. **d.** pound.

\_\_\_\_\_ **15.** One newton is equal to the weight of an object that has  
**a.** a mass of 100 g on the moon.  
**b.** a volume of 1 m<sup>3</sup> on Earth.  
**c.** a mass of 1,000 g on Earth.  
**d.** a mass of 100 g on Earth.

**16.** What is the only way to change the mass of an object?

\_\_\_\_\_

\_\_\_\_\_

**THE DIFFERENCE BETWEEN MASS AND WEIGHT**

**For each description, write whether it applies to mass or to weight.**

\_\_\_\_\_ **17.** is always constant no matter where the object is located.

\_\_\_\_\_ **18.** is a measure of the gravitational force on an object.

\_\_\_\_\_ **19.** is measured using a spring scale.

\_\_\_\_\_ **20.** is expressed in grams (g), kilograms (kg), or milligrams (mg).

\_\_\_\_\_ **21.** is expressed in newtons (N).

\_\_\_\_\_ **22.** is less on the moon than on Earth.

\_\_\_\_\_ **23.** is a measure of the amount of matter in the object.

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**INERTIA**

- \_\_\_\_\_ **24.** The tendency of an object to resist a change in motion is known as
- a.** mass
  - b.** gravitation
  - c.** inertia
  - d.** weight

**25.** What is needed in order to cause an object at rest to move, or an object in motion to change its direction or speed?

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**26.** How does mass affect the inertia of an object?

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**27.** Why is it harder to get a cart full of potatoes moving than one that is empty?

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# Answer Key

## Directed Reading A

### SECTION: WHAT IS MATTER?

1. B
2. D
3. They are all made of matter.
4. Matter is anything that has mass and takes up space.
5. Volume is the amount of space taken up by an object.
6. volume
7. meniscus
8. length, width, and height
9. cubic
10. Answers will vary. Sample answer: The volume could be measured by placing the nugget in a graduated cylinder with water. The volume of water displaced is the volume of the nugget.
11. Because 1 milliliter of water is equal to 1 cubic centimeter.
12. D
13. C
14. A
15. D
16. The only way to change the mass is to change the amount of matter it contains.
17. mass
18. weight
19. weight
20. mass
21. weight
22. weight
23. mass
24. C
25. An outside force is needed to change the motion of an object.
26. The more mass an object has, the greater its inertia.
27. Answers will vary. Sample answer: A full cart has more mass than an empty one. More mass means the cart has more inertia. Because it has more inertia, a full cart is harder to put into motion.

### SECTION: PHYSICAL PROPERTIES

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|------|------|
| 1. B | 6. C |
| 2. C | 7. B |
| 3. D | 8. E |
| 4. A | 9. G |
| 5. F |      |
10. physical property
  11. density
  12. density
  13. The densest layer will settle on the bottom.
  14. The least dense layer will be found on top.
  15. because 1 kg of lead would take up less space than 1 kg of feathers
  16. The object will sink.
  17. Answers will vary. Sample answer: If you know the density of the substance, you could compare it with the density of water. If the density of the object is less than water it will float.
  18.  $D = m/V$
  19. density; volume; mass
  20. volume
  21. Answers will vary. Sample answers: Because a substance's density is always the same at a given temperature and pressure and because most substances have different densities.
  22. properties
  23. boiling point and melting point
  24. solubility
  25. amount
  26. temperature
  27. specific heat
  28. low
  29. high
  30. glass
  31. physical change
  32. changes in state
  33. PC
  34. X
  35. PC
  36. PC
  37. PC
  38. PC
  39. identity