

The Work of Scientists ▪ *Guided Reading and Study*

Measurement—A Common Language

This section explains why scientists use a standard measurement system and identifies the standard units used for common measurements. It also explains how to convert from one unit to another.

Use Target Reading Skill

As you read, compare and contrast different types of measurements by completing the table below.

Measurement

Characteristic	Length	Mass	Volume
Definition			
SI Unit			
Measuring Tool			

Characteristic	Density	Time	Temperature
Definition			
SI Unit			
Measuring Tool			

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Measurement—A Common Language *(continued)*

A Standard Measurement System

1. What is the metric system?

2. Modern scientists use a version of the metric system called the _____,
abbreviated _____.
3. Circle the letter of each advantage of using SI as the standard system of scientists.
 - a. Using SI allows scientists to compare data.
 - b. Every country can have its own system.
 - c. All units can be expressed in the French language.
 - d. Scientists can communicate with each other about their results.
4. SI units are based on multiples of _____.

Match the SI prefix with its meaning by writing the letter of the meaning in the correct blank.

- | | |
|----------------|---------------------------|
| ___ 5. hecto- | a. 1,000 |
| ___ 6. deci- | b. 100 |
| ___ 7. milli- | c. 10 |
| ___ 8. kilo- | d. 0.1 (one tenth) |
| ___ 9. deka- | e. 0.01 (one hundredth) |
| ___ 10. centi- | f. 0.001 (one thousandth) |
11. Is the following sentence true or false? Each SI unit is 10 times smaller than the next smallest unit. _____

Length

12. What is length?

13. The basic unit of length in the SI system is the _____.

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14. Which of the following sentences are true about meter measurements?
- a. Most 13-years old are between 1.5 and 2 meters tall.
 - b. The distance from the floor to a common doorknob is about 1 meter.
 - c. The ceiling in your classroom is about 1 meter above the floor.
 - d. Your arm is about 20 meters long.
15. One meter equals _____ centimeters.
16. Circle the letter of a common tool used to measure metric length.
- a. metric balance
 - b. metric ruler
 - c. graduated cylinder
 - d. kelvin

Mass

17. What is mass?
- _____
- _____
18. The basic unit of mass in the SI system is the _____.
19. 1 kilogram = 1,000 _____.
20. A device that works by comparing the mass of an object to a known mass is called a(n) _____.
21. Circle the letter of the best definition of weight.
- a. A measure of the amount of matter an object contains
 - b. A measure of the amount of space an object takes up
 - c. A measure of the force of gravity acting on an object
 - d. A measure of how much mass is contained in a given volume

Volume

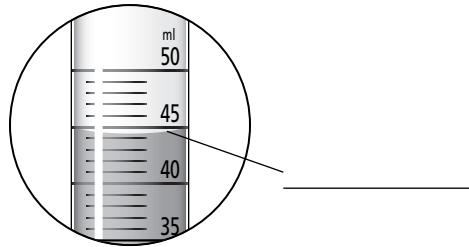
22. What is volume?
- _____
- _____
23. The tool that scientists commonly use to measure liquid volume is the _____.
24. 1 _____ = 1,000 milliliters

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Measurement—A Common Language *(continued)*

25. What does the line point to? Write your answer in the space provided.



26. Circle the letter of each unit used to measure the volume of a solid object.

- a. cubic meter (m^3)
- b. cubic gram (g^3)
- c. liter (L)
- d. cubic centimeter (cm^3)

27. What is the formula used to calculate the volume of a regular solid?

28. Is the following sentence true or false? One method used to measure the volume of an irregular solid involves immersing the object in water. _____

Density

29. What is density?

30. What is the formula used to calculate the density of an object?

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31. Circle the letter of each common unit of density.

- a. grams per milliliter (g/mL)
- b. cubic gram (g³)
- c. grams per cubic centimeter (g/ cm³)
- d. cubic centimeter (cm³)

32. What is the density of an object with a volume of 20 cm³ and a mass of 40 g?

33. Is the following sentence true or false? The density of a substance is the same for all samples of the substance. _____

34. An object will float if it is _____ dense than the surrounding liquid.

Time

35. What is the SI unit used to measure time?

36. 1 second = 1,000 _____.

Temperature

37. The temperature scale that scientists commonly use is the _____ temperature scale.

38. What is the official SI unit for temperature? _____

39. Circle each sentence that is true about the Kelvin scale.

- a. The Kelvin scale has no negative numbers.
- b. Absolute zero is equal to -273° on the Kelvin scale.
- c. Nothing can get colder than 0 K.
- d. Water boils at 373 K.

Converting Between Units

40. An equation that shows how two units of measurement are related is called a(n) _____.

41. How many grams are there in 1.5 kilograms?

