

3.2

THE INTERNATIONAL SYSTEM OF UNITS

Section Review

Objectives

- List SI units of measurement and common SI prefixes
- Distinguish between the mass and weight of an object
- Convert between Celsius and Kelvin temperature scales

Vocabulary

- | | | |
|--------------------------------------|-----------------|-----------------|
| • International System of Units (SI) | • kilogram (kg) | • absolute zero |
| • meter (m) | • gram (g) | • energy |
| • liter (L) | • temperature | • joule (J) |
| • weight | • Celsius scale | • calorie (cal) |
| | • Kelvin scale | |

Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

The International System of Units (SI) is a revision of the _____ **1** _____ system. There are _____ **2** _____ SI base units. In SI, the base unit of length is the _____ **3** _____.

The space taken up by a cube that is 10 cm on each edge is one _____ **4** _____. A measure of the pull of gravity on an object of given mass is its _____ **5** _____. The mass of one cubic centimeter of water at 4°C is one _____ **6** _____. Scientists commonly use two equivalent units of temperature, the degree _____ **7** _____ and the _____ **8** _____. The _____ **9** _____ and the _____ **10** _____ are common units of energy.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

- _____ 11. The SI base unit of mass is the milliliter.
- _____ 12. A decigram is 100 times smaller than a gram.
- _____ 13. The SI unit of volume is derived from the unit of length.
- _____ 14. There are six basic SI units of measurement.

Part C Matching

Match each description in Column B to the correct term in Column A.

Column A

- _____ 15. Kelvin scale
- _____ 16. International System of Units (SI)
- _____ 17. temperature
- _____ 18. meter
- _____ 19. calorie
- _____ 20. Celsius scale
- _____ 21. liter
- _____ 22. joule
- _____ 23. weight
- _____ 24. absolute zero
- _____ 25. kilogram
- _____ 26. gram
- _____ 27. energy

Column B

- a. quantity of heat that raises the temperature of 1 g of pure water by 1°C.
- b. the capacity to do work or to produce heat
- c. the SI unit of energy
- d. non-SI unit of volume
- e. standardized system of measurement based on the metric system
- f. mass unit commonly used in chemistry
- g. the SI unit of length
- h. force that measures the pull of gravity on a given mass
- i. zero point on the Kelvin scale equal to -273.15°C
- j. SI base unit of mass
- k. temperature scale on which the freezing point of water is 273.15° and its boiling point is 373.15°
- l. freezing scale that sets the freezing point of water at 0° and its boiling point at 100°
- m. measure of how hot or cold an object is

Part D Questions and Problems

Answer the following in the space provided.

28. What is the volume of a board that measures 1.8 cm by 8.8 cm by 30.5 cm?

29. Hydrogen boils at 20K. What is the boiling point of hydrogen on the Celsius scale?

30. What is the symbol and meaning of each prefix?

a. *pico-*

a. _____

b. *kilo-*

b. _____

c. *micro-*

c. _____

d. *centi-*

d. _____