1-4 Explore

Solve each of the following problems as directed. Show all your work. Use the correct abbreviation for each unit.

1. Convert 83-cm into meters.

2. Convert 459-L into milliliters.

3. Express 1123-pg in nanograms.

4. Express 0.032-m^3 in liters.

5. Express 2.5-mm in micrometers.

6. Which is the longer amount of time, 1351-ps or 1.2-ns? Explain your answer.

7. Which is the larger pressure, 232.1-kPa or 125,487-Pa? Explain your answer.

8. Which is the smaller mass, 285.0 cg or 23.78 dg? Explain your answer.

9. Which is the shorter length, 175.6-mm or 38.4-cm? Explain your answer.

10. Convert the masses below into grams.
    a. 0.7824-mg
    b. 345,000-ng
    c. 0.003 78-kg
    d. 34,981-Mg

1-6 Explore

Paper Clip Patterns

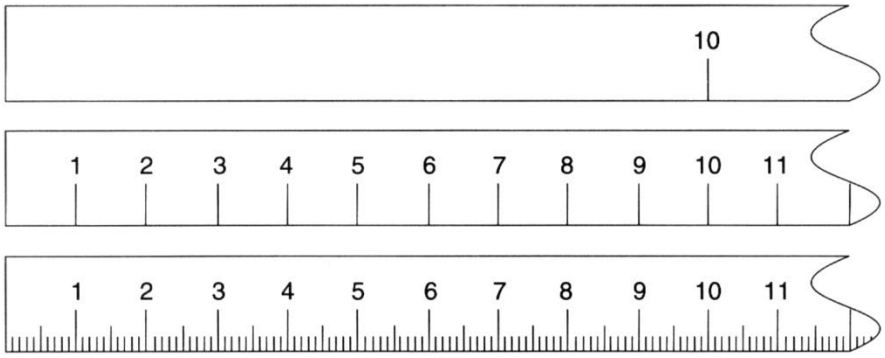
In this activity you will explore why measurements involve a degree of uncertainty.

Materials (per student)

Paper Clip

Procedure

1. Measure the length of a paper clip on each ruler pictured below. The measurements will not be identical. Write your answers in the space provided.



length of paper clip _____-cm

length of paper clip -cm

length of paper clip _____-cm

Questions

1. Were all of your measurements identical? Explain.

2. Which measurement required the greatest amount of estimation? Explain.

3. How do your measurements indicate this difference in the degree of estimation needed?

1-6 Practice Problems

Identify the number of significant digits in each of the following measurements. Write the number in the space provided.

1. 520-mL _____
2. 0.0102-ms _____
3. 0.230-kg _____
4. 25,600-L _____
5. 10.002-ns _____
6. 0.451-Pa _____
7. 0.001-cm _____

Perform the following calculations and round off the answer to the correct number of significant digits.

8. 0.3287-g x 45.2-g =?

9. 125.5-kg + 52.68-kg + 2.1-kg =?

10. $\frac{52.8\ \text{Pa} + 3.0025\ \text{Pa}}{253.4\ \text{Pa}} = ?$

11. (0.12-g + 5.16-g) x (45.56-g - 93.0-g) = ?

12. 68.32-ns + (-1.001-ns) + (-0.00367-ns) + (-678.1-ns) = ?

13. 0.258-mL + 0.36105-mL =?

14. (1250-cal - (234.207-cal ÷ 52.69-cal)) =?

15. $\frac{78.26\ \text{L} - 89.50\ \text{L}}{678.2\text{-L} + 9511\text{-L}} = ?$

1-6 Practice Problems (continued)

Express each of the following numbers in scientific notation.

16. 8960

17. 0.00023 _____

18. 86,000 _____

19. 36,000,000 _____

20. 0.0000000253 _____

Check the following equalities for errors. If an answer is correct, write "correct" in the space provided. If an answer is incorrect, rewrite it to make it correct.

21. $45,630,000 = 4.563 \times 10^{7}$ _____

22. $0.000253 = 2.53 \times 10^{-3}$ _____

23. $680,500,000 = 68.05 \times 10^{8}$ _____

Solve each of the following problems as directed. Show all your work.

24. An unknown liquid has a mass of 30.6-g and a volume of 52.3 mL. What is the density of the liquid?

25. Iron has a density of 7.86-g/cm^3. Could a block of metal with a mass of 18.2-g and a volume of 2.56-cm^3 be Iron? Explain.

26. The density of Gold is 19.3-g/cm^3. What is the mass of 11.3-cm^3 of Gold?

27. The density of ice is 0.917-g/cm^3. How much volume does 52.3-g of ice occupy?

28. If 1.35-g of aluminum occupies 0.500 cm^3, what is the density of Aluminum?

Place a P next to physical changes, and a C next to chemical changes.

___ Rusting Iron
___ Breaking a tree limb
___ Cutting paper
___ Yeast making bread rise
___ Souring of milk
___ Wadding up paper
___ Erasing a pencil mark
___ Freezing water
___ Boiling water
___ Salting ice on a sidewalk
___ Baking powder in cake
___ Bending a wire

___ Etching glass with acid
___ Stalagmites forming in caves
___ Fertilizing a lawn
___ Crushing ice in a blender
___ Evaporation of lake water
___ Eating food
___ Burning gas in a car
___ Burning logs in a fireplace
___ Toasting marshmallows
___ Adding bleach to water
___ Slicing a block of cheese
___ Making blue cheese.