13. _____ Calculate the volume of the sphere in mL as measured in the beaker. Convert to cm^3 knowing that 1 cm^3 = 1 mL.

14. _____ Calculate the volume of the sphere in mL as measured in the graduated cylinder. Convert to cm^3 knowing that 1 cm^3 = 1 mL.

15. Using the density formula $D = \frac{mass}{volume}$, calculate the density of the sphere as determined by the

    a. _____ tape measure

    b. _____ beaker

    c. _____ graduated cylinder

16. _____ Use dimensional analysis to convert these three densities into lbs/ft^3.

CONCLUSION QUESTIONS

1. Compare the densities of the cube when the volume is measured by a ruler, beaker and graduated cylinder. Which of the instruments gave the most accurate density value? Use the concept of significant digits to explain your answer.

2. A student first measures the volume of the cube by water displacement using the graduated cylinder. Next, the student measures the mass of the cube before drying it. How will this error affect the calculated density of the cube? Your answer should state clearly whether the calculated density will increase, decrease or remain the same and must be justified.

3. A student measures the circumference of a sphere at a point slightly higher than the middle of the sphere. How will this error affect the calculated density of the cube? Your answer should state clearly whether the calculated density will increase, decrease, or remain the same and must be justified.

ANALYSIS

- Show your *organized* work on a piece of notebook paper. Transfer your final answers to the blanks beside each question. Staple your work to your answer sheet before turning it in.
- Remember to follow the rules for reporting all data and calculated answers with the correct number of significant digits.
- You may need tables of metric and English conversion factors to work some of these problems.

1. For each of the measurements you recorded above, go back and indicate the number of significant digits in parentheses after the measurement. Ex: 15.7 cm (3sd)

2. Use dimensional analysis to convert the mass of the cube to
   a._____mg

   b. _____ounces

3. _____ Calculate the volume of the cube in cm^3.

4. _____ Use dimensional analysis to convert the volume of the cube from cm^3 to m^3.

5. _____ Calculate the volume of the cube in mL as measured in the beaker. Convert the volume to cm^3 knowing that 1 cm^3 = 1 mL.

6. _____ Calculate the volume of the cube in mL as measured in the graduated cylinder. Convert to cm^3 knowing that 1 cm^3 = 1 mL.

7. Using the density formula $D = \frac{mass}{volume}$, calculate the density of the cube as determined by the
   a._____ruler

   b. _____beaker

   c._____graduated cylinder

8. Use dimensional analysis to convert these three densities into kg/m^3.

9. Convert the mass of the sphere to
   a._____kg

   b. _____lbs

10. _____ Using the measured circumference, calculate the diameter of the sphere.

11. _____ Calculate the radius of the sphere.

12. _____ Calculate the volume of the sphere from its radius.