

Measurement in the Laboratory Worksheet

Activity 1. Measuring Length

Textbook Measurement			
Dimension	Millimeters (mm)	Centimeters (cm)	Meters (m)
Length			
Width			
Height			

Activity 2. Measuring Volume

Part A. Direct Method			
	Milliliters (mL)	Microliters (μ L)	Liters (L)
Water			

Part B. Displacement Method		
Initial water volume (mL)	Final water volume (mL)	Water displaced (volume of screw) (mL)

Activity 3. Measuring Mass

Water Measurement		
Mass of cup (g)	Mass of cup and 100 mL of water (g)	Mass of 100 mL of water (g)

Activity 4. Measuring Density

Density Measurement					
Substance	Mass of Cup (g)	Mass of Cup and Substance (g)	Mass of Substance (g)	Volume of Substance (mL)	Density of Substance (g/cm ³)
Water					
Salt Water					
Isopropyl Alcohol					

Activity 5. Measuring Temperature

Temperature Measurement		
Time (minutes)	Black Sand Temperature °C	White Sand Temperature °C
Initial		
2		
4		
6		
8		

Activity 6. Measuring Low Concentrations of Water Pollutants

Concentration of Red Dye		
Solution	Percent	Concentration (ppm)
Cup 1		
Cup 2		
Cup 3		
Cup 4		
Cup 5		

Post-Lab Questions (Answer questions 1–3 and 10 on the Measurement in the Laboratory Worksheet. Use a separate sheet of paper to answer the remaining questions.)

1. Convert the data from Activity 1 from millimeters to centimeters and meters. Record answers in the Activity 1 data table of the worksheet.
2. Convert the data from Activity 2 to microliters and liters. Record answers in the Activity 2 data table.
3. Convert the length measurements of the textbook in Activity 1 to volume by multiplying length, width and height. Record the answer in cubic centimeters.
4. Calculate the density of each liquid in Activity 4 by dividing the mass by volume. Record the values in the Activity 4 data table on the worksheet.
5. In Activity 3 the mass of 100-mL of water was determined. Using this data, calculate the density of the water. *Note:* Give answer in either g/mL or g/cm^3 .
6. How does the density of water calculated in Question 5 compare to the density value obtained in Activity 4?
7. Which liquid in Activity 4 has a greater density than water? Which liquid has a density less than water?
8. In Activity 5 the temperature of two different colors of sand, black and white, were compared. Using the data from Activity 5, graph the temperature values for the 8-minute exposure of each color of sand. *Note:* Graph both sand colors on the same graph using a different colored pen or pencil for each. Use the horizontal (x) axis for the time and vertical (y) for the temperature. Label each axis—do not forget the *units*—make sure the scale is clearly marked. Draw two best fit lines, one for each color of sand through the data points.
9. Compare and contrast the temperature change of each color sand after 8 minutes. Explain the difference.
10. Determine the parts per million of red solution in each cup by multiplying the percent (as a decimal) by one million. Record answers in the Activity 6 data table on the worksheet.
11. Janet received a small fish tank for her birthday. However, it did not say how many liters of water it holds. Based on the measurement methods in this lab name two ways Janet could figure out how many liters of water her fish tank holds.