

Activity 6a: Volume Calculations

Equipment Required	Part Number
Special meter stick (four-sided meter stick)	part of ME-9849
Sample object for measuring volume (block or box)	

Before the Lab:

1. Leave the object at one location in the lab.
2. Review significant figures: the number of digits that are certain plus one more that is estimated.



Procedure

1. Measure the length, width and height of the sample object XVLQJ WKH VLGH RI WKH VWLFN ZLWK QR JUDGXDWLRQT

Trial #	Length (cm)	Width (cm)	Height (cm)	Volume (cm ³)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

2. Calculate the volume of the object. Round off your answer according to the rules on significant figures. Record your answer in the table.

3. Repeat steps 1 and 2 using the same side of the special meter stick. Record data under Trial #2.
4. For Trial #3 and Trial #4, repeat steps 1 and 2 but use the side of the special meter stick with decimeter graduations. Record your data and calculations. Enter them in your data table.
5. For Trial #5 and Trial #6, repeat steps 1 and 2 but use the side of the special meter stick with centimeter graduations. Record your data and calculations. Enter them in your data table.
6. For Trial #7 and Trial #8, repeat steps 1 and 2 but use the side of the special meter stick with millimeter graduations. Record your data and calculations. Enter them in your data table.
7. For Trial #9 and Trial #10, repeat steps 1 and 2 but use different side of the special meter stick for different dimensions. For example, use the side graduated in decimeter to measure the length, the side graduated in centimeter to measure the width, and side graduated in millimeter to measure the height. Do not forget to observe the rules on significant figures. Record your data and calculations. Enter them in your data table.

Post-Lab Discussion

Discuss how the side of the meter stick used in measurement influence the digits you keep in the calculated volume. Discuss how you maintained precision through the calculation.

Looking at your data table, discuss the factor/s that determine the precision of the volume calculation.

Questions:

1. What determines the precision of the volume calculation?
 2. Why is it important to use the same technique to measure each length? For example, if you remember to take into account parallax for one measurement and you do not for the other measurements, how will this effect your final volume calculation?
 3. Calculate the following:
 $4.1 \text{ cm} \times 3.759 \text{ cm} \times 2.124 \text{ cm} =$
 $4.2 \text{ cm} \times 3.759 \text{ cm} \times 2.124 \text{ cm} =$
 $4.3 \text{ cm} \times 3.759 \text{ cm} \times 2.124 \text{ cm} =$
 4. What digits place is uncertain in the answers?
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