

2 • What Can We Measure About Chemicals?

STATION 1 • PERCENT COMPOSITION

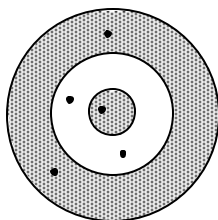
Calculate the molar masses of NaOCl and Ca(NO₃)₂.

Calculate the percent composition of each element in the following compounds.

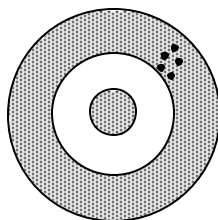
NaOCl	Na = _____ =	O = _____ =	Cl = _____ =
Ca(NO ₃) ₂	Ca = _____ =	N = _____ =	O = _____ =

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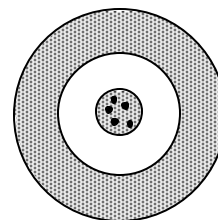
STATION 2 • ACCURACY & PRECISION



accurate? ___ precise? ___



accurate? ___ precise? ___



accurate? ___ precise? ___

The density of lead is 11.3 g/cm³.

When you measure a sample, you get 10.9 g/cm³.

How accurate is your value?

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STATION 3 • PRECISION & \pm NOTATION

Consider the following data for the mass of an object:

12.53 g	12.82 g	11.78 g	11.95 g	12.02 g	12.10 g	11.83 g
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This data should be reported as: _____ \pm _____ g

Another class obtains an answer of $12.05 \pm .45$ g.

This result is _____ (more precise / less precise / the same precision) as your answer above.

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STATION 4 • SCIENTIFIC NOTATION

Change the following to Scientific Notation:

- | | |
|---------------------------|----------------------|
| 1. 5.28 = _____ | 6. 2,560 = _____ |
| 2. 2,000 = _____ | 7. 0.0009 = _____ |
| 3. 15 = _____ | 8. 8,900,000 = _____ |
| 4. 6,589,000 = _____ | 9. 0.092 = _____ |
| 5. 70,400,000,000 = _____ | 10. 6,300 = _____ |

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STATION 5 • METRIC CONVERSIONS

1 m = _____ cm

1 m = _____ mm

1 km = _____ m

Convert 2570 cm into km:

Convert 0.000335 km into cm:

Convert 2.58×10^5 cm into km

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STATION 6 • MOLE PROBLEMS

What volume (measured at STP) will 3.75 grams of helium gas occupy?

What mass of water contains 5.00×10^{24} molecules?

A 1.0 L sample of a gaseous element has a mass of 1.78 grams. Which element is it?

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STATION 7 • DENSITY FROM DATA

DATA

Length of metal block	3.57 cm
Width of metal block	2.83 cm
Height of metal block	1.75 cm
Mass of metal block	139.00 g

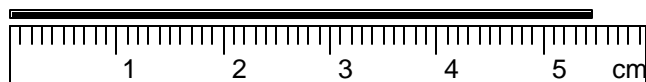
Use the data to identify the metal in the block:

aluminum	(density = 2.70 g/cm ³)
copper	(density = 8.92 g/cm ³)
iron	(density = 7.86 g/cm ³)
gold	(density = 19.3 g/cm ³)

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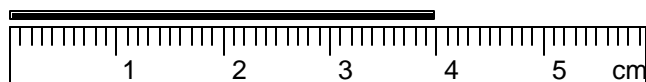
STATION 8 • MAKING MEASUREMENTS

1. Look at the ruler below:



What is the correct measurement for the length of the black line? _____

2. Look at the ruler below:



What is the correct measurement for the length of the black line? _____

3. Use the plastic ruler. The length of this line is:



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STATION 9 • LAB PRACTICAL

At this station there should be:

- an electronic balance
- some paper towels
- a graduated cylinder
- a blue object
- water bottle
- container for used water

Your task is to determine the **density of the blue object**.

Notes:

- You can determine the volume of the cylinder by measuring the volume of water with and without the cylinder in the container.
- DRY the cylinder before you get its mass.

DATA:

Volume of water in the graduated cylinder	
Volume of water + blue object in the graduated cylinder	
Mass of blue object	

CALCULATIONS:

Volume of blue object	
Density of blue object	