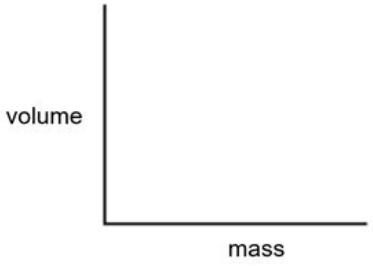
N	**108 Density**	
	Objectives 1. Define density 2. Determine density of regular objects 3. Determine density of irregular objects 4. Calculate density, mass, or volume given the other two	

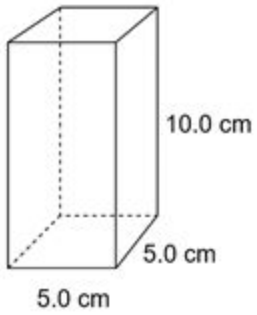
108.1 Density

Mass (g)	Volume (cm^3)	Density (g/cm^3)
27.0	10.	
32.4	12	
37.8	14	
43.2	16	
48.6	18	
54.0	20	



108.2 Density of regular objects

1. Determine the density of the block below if it has a mass of 600. grams.



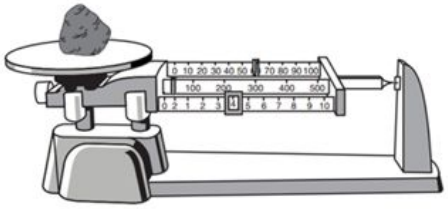
2. Determine the mass of iron with a volume of 16.05 cm^3

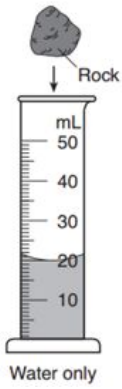
3. Determine the volume of zinc with a mass of 321.5 grams.

108.3 Density of irregular objects

1. Determine the density of the rock using the data below.

mass of rock : 64.00 g





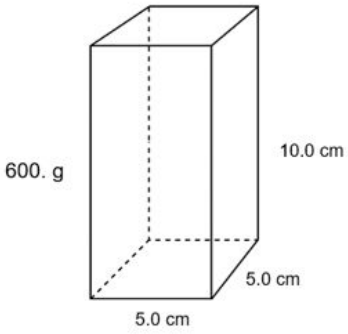
Final volume: 30.0 mL

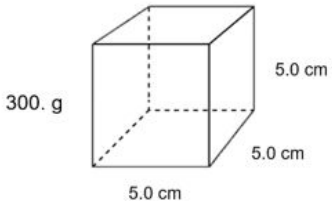
Initial volume: 20.0 mL

2. The water in the graduated measuring cylinder initially at 265 mL rises to 286 mL after a piece of copper is submerged. What is the mass in grams of the copper?

108.4 Intensive Property of Density

Describe how density is affected when a sample of matter changes.





108.5 Comparing Densities

In the solid phase, arsenic (As) occurs in two forms. One form of yellow arsenic has a density of 1.97 g/cm^3 at STP. The other form grey arsenic has a density of 5.78 g/cm^3 at STP. Compare in terms of the arrangement of atoms, why the two forms of arsenic have different densities at STP.

108 Concept Check

The table below shows the mass and volume data for four samples of substances at STP.

Masses and Volumes of Four Samples

Sample	Mass (g)	Volume (mL)
A	30.	60.
B	40.	50.
C	45	90.
D	90.	120.

1. Which two samples could consist of the same substance?
   (1) A and B
   (2) A and C
   (3) B and C
   (4) C and D

2. What is the volume of a 16.24 g sample of magnesium in grams per cubic centimeters?
   (1) 1.74
   (2) 16.24
   (3) 019
   (4) 9.33

3. What is the mass of 26.70 cm^3 of sodium?
   (1) 26.70 g
   (2) 25.98 g
   (3) 0.04 g
   (4) 13.56 g

4. Which element has the greatest density at STP?
   (1) scandium
   (2) selenium
   (3) silicon
   (4) sodium

5. Compared to a 10.0 grams sample of Ag(s) at 25 ^oC, a 20.0 gram sample of Ag(s) at 25 ^oC has
   (1) the same density
   (2) a different density

6. At STP, a 7.49 grams sample of an element has a volume of 1.65 cm^3. The sample is most likely
   (1) Ta
   (2) Tc
   (3) Te
   (4) Ti