Density Sample Sets

611-2030 (30-105) Aluminum, 611-2035 (30-106) Brass, 611-2040 (30-107) PVC, 611-2045 (30-108) Tecaform, 611-2050 (30-109) All Four (4) sets

Additional Materials Needed:

- Analytical balance
- Graphing calculator
- Calipers

Description:

This lab is actually four sets of samples, twelve (12) pieces in each set, each sample of a different length. Determine the mass and volume of each sample and graph the mass versus volume. The slope of the straight line that results is the density of the material. The attractive wood holder allows the teacher to see immediately when all of the specimens have been returned. *Includes:* 12 samples of varying lengths in your choice of aluminum, brass, PVC, and Tecaform; instructions; wood base with holes for each specimen.

How To Use:

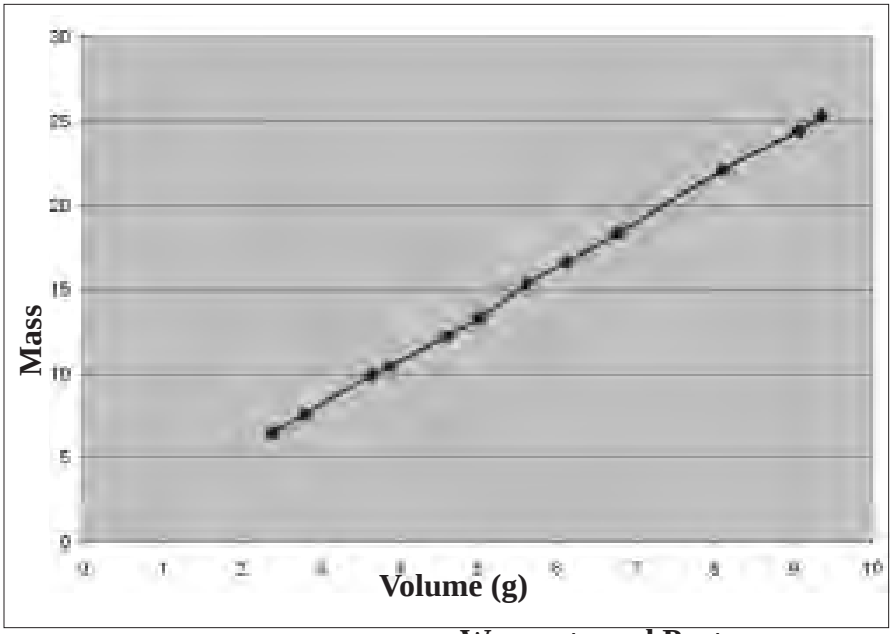
1. Measure the length and diameter of each specimen with a calipers. Record data.
2. Weigh each specimen on an analytic balance to the nearest 0.1 gram (tenth of a gram). Record data.
3. Calculate volume using this formula:

   $V = \pi r^2 \ell$

   where: r = radius
   ℓ = length
4. Plot a graph with the volume on the x axis, the mass on the y axis.
5. Determine the best fit straight line with a graphing calculator or draw by eye.
6. Calculate the slope of the line. The slope is the density.
7. By doing 12 calculations, you minimize the likelihood of measurement errors.

Sample problem and graph

Specimen	Mass grams	Length cm	Diameter cm	Radius, cm	Volume cm^3
1	6.40	1.91	1.26	0.63	2.38
2	7.60	2.24	1.26	0.63	2.79
3	9.90	2.88	1.27	0.64	3.65
4	10.40	3.15	1.25	0.63	3.87
5	12.20	3.68	1.26	0.63	4.59
6	13.30	4.02	1.26	0.63	5.01
7	15.30	4.50	1.26	0.63	5.61
8	16.60	4.82	1.27	0.64	6.11
9	18.30	5.52	1.25	0.63	6.77
10	22.10	6.50	1.26	0.63	8.10
11	24.40	7.40	1.25	0.63	9.08
12	25.30	7.62	1.25	0.63	9.35



Densities (kg/m^3)

PVC:	1470
Aluminum:	2700
Brass:	8410
Tecaform:	1400

(approx densities +/-40 $kg/m^{3)}$

Warranty and Parts:

We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School P.O.s. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain small parts that can be choking hazards. Adult supervision is required. **Designed and prototyped in the U.S.A.** Made in China.

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