
CHEMISTRY

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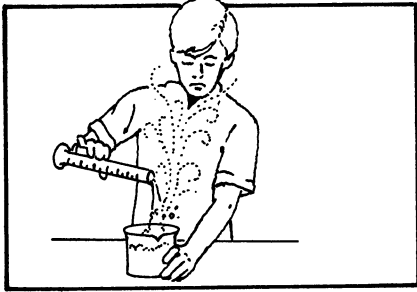
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LABORATORY DOS AND DON'TS

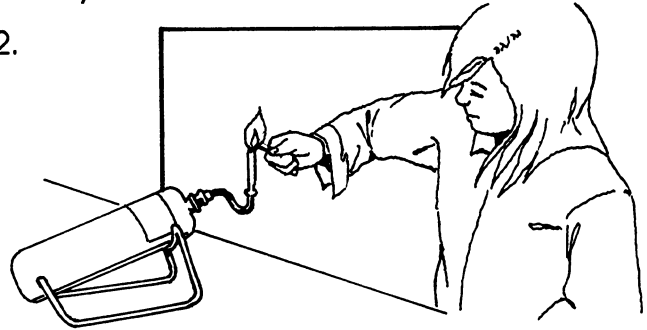
Name _____

Identify what is wrong in each picture of the laboratory activities below.

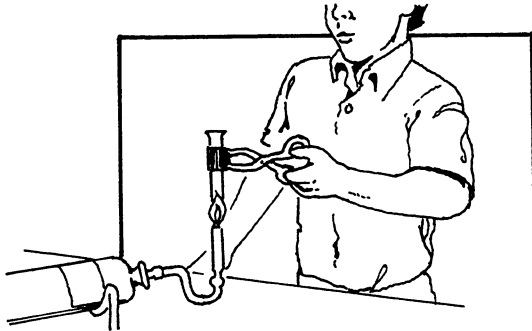
1.



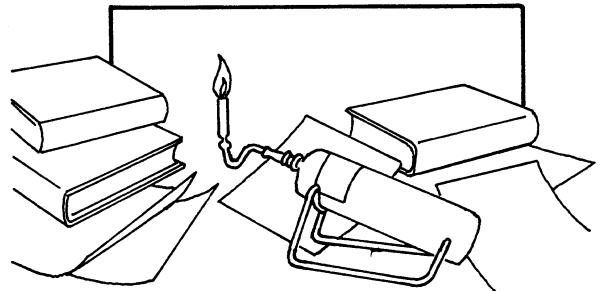
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6.

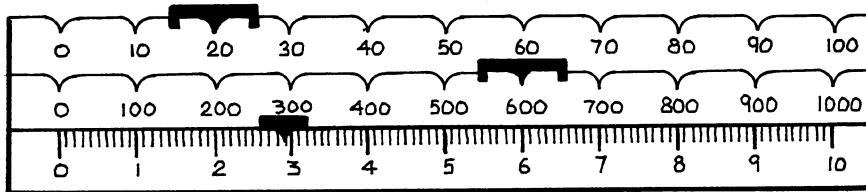


THE TRIPLE AND FOUR BEAM BALANCES

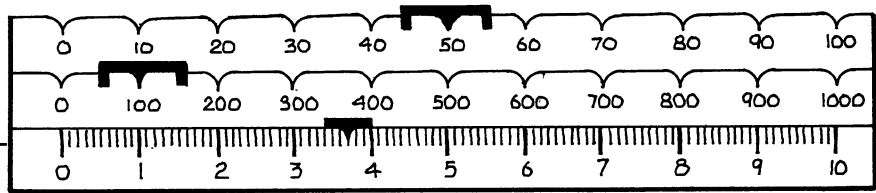
Name _____

What masses are shown on each of the following balances?

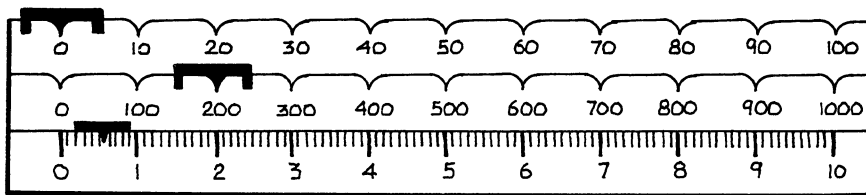
Triple Beam Balance



Answer: _____

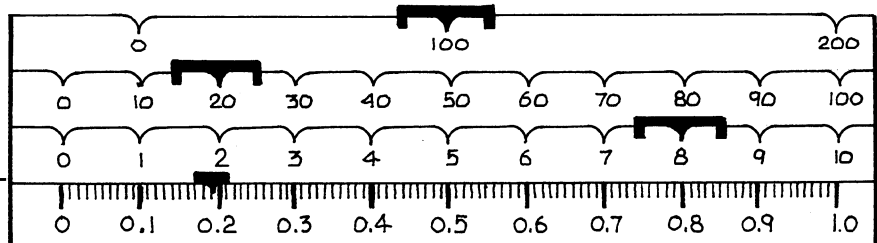


Answer: _____

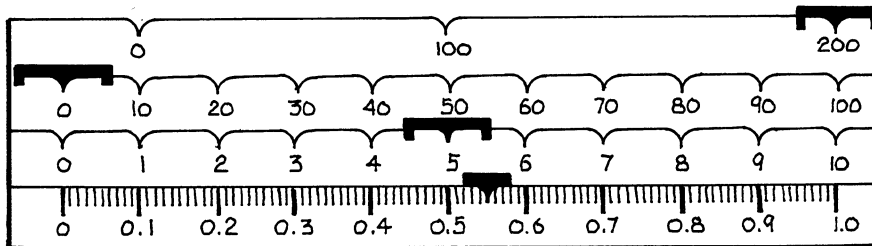


Answer: _____

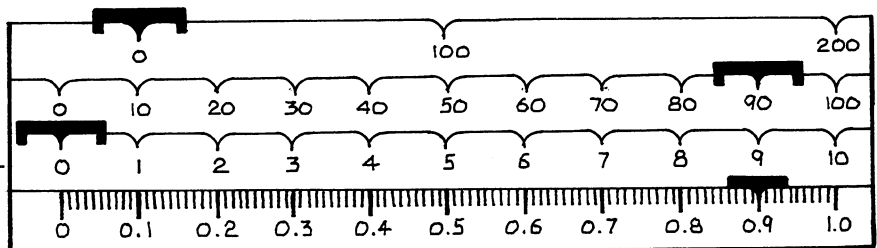
Four Beam Balance



Answer: _____



Answer: _____



Answer: _____

DIMENSIONAL ANALYSIS (FACTOR LABEL METHOD)

Name _____

Using this method, it is possible to solve many problems by using the relationship of one unit to another. For example, 100 cm = one metre. Since these two numbers represent the same value, the fractions 100 cm/1m and 1m/100 cm are both equal to one. When you multiply another number by the number one, you do not change its value. However, you may change its unit.

Example 1: Convert 2 kilometres, Centimetres

$$2 \text{ kilometres} \times \frac{1000\text{m}}{1 \text{ km}} \times \frac{100 \text{ cm}}{1 \text{ m}} = 2\,000\,000 \text{ cm}$$

Example 2: How many seconds are in 4 days?

$$4 \text{ days} \times \frac{24 \text{ hrs}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 345,600 \text{ sec}$$

(Using significant figures,
4 days = 300,000 sec.)

Solve the following problems. Write the answers in significant figures.

- 3 hrs = _____ sec
- 0.035 mg = _____ cg
- 5.5 weeks = _____ days
- 2.3 m = _____ mm
- 1.3 yrs = _____ hr (1 yr = 365 days)
- 3 moles = _____ molecules (1 mole = 6.02×10^{23} molecules)
- 2.5×10^{24} molecules = _____ moles
- 5 moles = _____ liters (1 mole = 22.4 liters)
100. liters = _____ moles
50. liters = _____ molecules
- 5.0×10^{24} molecules = _____ liters
- 7.5×10^3 mL = _____ liters

METRICS AND MEASUREMENT

Name _____

In the chemistry classroom and lab, the metric system of measurement is used, so it is important to be able to convert from one unit to another.

mega	kilo	hecto	deca	Basic Unit	deci	centi	milli	micro
(M)	(k)	(h)	(da)	gram (g)	(d)	(c)	(m)	(μ)
1,000,000	1000	100	10	liter (L)	.1	.01	.001	.000001
10 ⁶	10 ³	10 ²	10 ¹	meter (m)	10 ⁻¹	10 ⁻²	10 ⁻³	10 ⁻⁶

Factor Label Method

- Write the given number and unit.
- Set up a conversion factor (fraction used to convert one unit to another).
 - Place the given unit as denominator of conversion factor.
 - Place desired unit as numerator.
 - Place a "1" in front of the larger unit.
 - Determine the number of smaller units needed to make "1" of the larger unit.
- Cancel units. Solve the problem.

Example 1: 55 mm = ____ m

$$\frac{55 \cancel{\text{mm}}}{1000 \cancel{\text{mm}}} \times \frac{1 \text{ m}}{1} = 0.055 \text{ m}$$

Example 2: 88 km = ____ m

$$\frac{88 \cancel{\text{km}}}{1 \cancel{\text{km}}} \times \frac{1000 \text{ m}}{1} = 88,000 \text{ m}$$

Example 3: 7000 cm = ____ hm

$$\frac{7000 \cancel{\text{cm}}}{100 \cancel{\text{cm}}} \times \frac{1 \cancel{\text{m}}}{100 \cancel{\text{m}}} \times \frac{1 \text{ hm}}{1} = 0.7 \text{ hm}$$

Example 4: 8 daL = ____ dL

$$\frac{8 \cancel{\text{daL}}}{1 \cancel{\text{daL}}} \times \frac{10 \cancel{\text{L}}}{1 \cancel{\text{L}}} \times \frac{10 \text{ dL}}{1} = 800 \text{ dL}$$

The factor label method can be used to solve virtually any problem including changes in units. It is especially useful in making complex conversions dealing with concentrations and derived units.

Convert the following.

- 35 mL = _____ dL
- 950 g = _____ kg
- 275 mm = _____ cm
- 1,000 L = _____ kL
- 1,000 mL = _____ L
- 4,500 mg = _____ g
- 25 cm = _____ mm
- 0.005 kg = _____ dag
- 0.075 m = _____ cm
- 15 g = _____ mg