In this activity you will match each piece of laboratory equipment with the proper term found below. At the end of this unit you will also be expected to know the function of each piece of laboratory equipment.

**2**

**3**



**1**

**4**

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**11**

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**9**



**12**

**14**



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**18**

**15**

**19**



**13**

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**20**

**16**

Beaker Funnel Test tube brush Erlenmeyer Flask

Bunsen burner Goggle Test tube clamp Pipette (disposable)

Clay Triangle Graduated Cylinder Test tube rack Well Plate

Crucible Hot plate Thermometer Evaporating dish

Dropper Metric Ruler Triple Beam Balance Test Tube

|  |  |  |
| --- | --- | --- |
| 1. \_\_\_\_\_\_\_\_\_Beaker\_\_\_\_\_
2. \_\_\_\_\_\_Test Tube Brush
3. \_\_\_Dropper\_\_\_\_\_\_
4. \_\_\_\_Funnel\_\_\_\_\_\_\_\_
5. \_\_\_\_Well Plate\_\_\_\_\_\_\_\_\_
6. \_Graduated Cylinder\_\_\_
7. \_\_Evaporating Dish\_\_\_\_
8. \_\_Clay Triangle\_\_\_\_\_\_
9. \_\_\_Hot Plate\_\_\_\_\_\_\_\_
10. Triple Beam Balance\_\_\_
 | 1. \_Test Tube Rack\_\_\_\_
2. \_Bunsen Burner\_\_\_\_\_
3. \_\_Clamp\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_Thermometer\_\_\_\_\_
5. \_\_Ruler\_\_\_\_\_\_\_\_\_\_\_\_\_
6. \_\_Pipette\_\_\_\_\_\_\_\_\_\_\_\_\_
7. \_\_\_Test Tube\_\_\_\_\_\_\_\_\_\_
8. \_\_Crucible\_\_\_\_\_\_\_\_\_\_\_\_
9. \_\_Goggles\_\_\_\_\_\_\_\_
10. \_Erlenmeyer Flask\_\_\_
 | 1. Circle 3 things that measure the volume of a liquid.
2. What unit would you use to measure the volume of liquids?\_\_Liters\_\_\_\_\_\_\_\_\_\_\_
3. What unit would you use to measure the length of a piece of paper? \_\_\_\_Meters\_(or cm)\_\_\_\_\_\_\_\_\_
4. What unit would you use to measure the temperature of a liquid?\_\_\_Celsius\_\_\_
5. What unit would you use to measure the mass of a rock? \_gram\_\_\_\_\_\_\_\_
 |

**Scientific Measurement Worksheet**

**Put the following in scientific notation:**

1. 0.000003 = \_\_\_\_3 x 10-6\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. 822000000 = \_\_\_\_8.22 x 108\_\_\_\_\_\_\_\_\_\_\_\_

3. (9.3 x 1013) x (1.23 x 1010) = \_\_\_\_1.1 x 1024\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. (6.53 x 10-16) x (2.93 x 10-4) = \_\_\_\_7.97 x 10-3\_\_\_\_\_\_\_\_\_

 (2.4 x 10-17)

**The following measurements were made. Express using scientific notation for one response.**

1. 0.000006 m \_\_\_6 x 10-6 m\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. 19000000 g \_\_\_1.9 x 107 g\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. 0.000000000006 m \_\_\_6 x 10-12 m\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. 0.0004 mol \_\_\_4 x 10-4 mol\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Make the following conversions: (SHOW YOUR WORK!!)**

1. 2.33 dm = \_\_2.33 x 10-1m\_\_\_\_\_\_\_\_\_\_\_\_ “d” is deci = 10-1 (NOT one I am making you memorize)

2. 1.4 kg = \_\_\_1400 g\_\_\_\_\_\_\_\_\_\_\_

3. 44.5 m = \_\_\_\_\_4450 cm or 4.45 x 103 cm\_\_\_\_\_\_

4. 145 g = \_\_145,000 mg or 1.45 x 106 mg\_\_\_\_\_\_\_\_

5. 229 K = \_\_\_\_\_-44oC

6. 20.5 K = \_\_\_\_\_\_-252.5 oC

**Metric Conversions**

|  |  |
| --- | --- |
| Convert 86 g to mg86 g x 1 mg = 86,0000 mg 1 x 10-3g | Convert 64 mL to L64 mL x 1 x 10-3 L = 0.064 L 1 mL |
| Convert 86.7 cm to mm86.7 cm x 1 x 10-2 m x 1 mm = 867 mm 1 cm 1 x 10-3m | Convert 24.2 ML to KL24.2 ML x 1 x 106 L x 1 KL = 24,200 KL 1 ML 1 x 103 L |
| Convert 2.3 m to mm2.3 m x 1 mm = 2300 mm 1 x 10-3 m | Convert 567 cm to m567 cm x 1 x 10-2 m = 5.67 m 1 cm |
| Convert 6.75 pg to ng6.75 pg x 1 x 10-12 g x 1 ng = .00675 ng 1 pg 1 x 10-9 g | Convert 68.7 l to ml68.7 l x 1 x 10-6 l x 1 ml = .0687 ml 1 l 1 x 10-3 l |
| 1.8 m to dm1.8 m x 1 dm = 18 dm 1 x 10-1 m | 0.05 kg to g0.05 kg x 1 x 103 g = 50 g 1 kg |
| 931.87 mg to cg931.87 mg x 1 x 10-3g x 1 cg = 93.187 cg 1 mg 1 x 10-2 g | 562 mg to g562 mg x 1 x 10-3 g = 0.562 g 1 mg |
| 9.60 m to km9.60 m x 1 km = .0096 km 1 x 103 m | * 1. cg to mg

25.6 cg x 1 x 10-2 g x 1 mg = 256 mg 1 cg 1 x 10-3g |
| 20.5 K to oC20.5 = C + 273-252.5 oC | 3 days to seconds3 days x 24 hrs x 60 min x 60 sec = 259,200sec 1 day 1 hr 1 min |
| 69 234 861 cm to km69234861 cm x 1x10-2 m x 1 km = 692.234861km 1 cm 1 x 103m | 6920 hours to days6920 hrs x 1 day = 288.33 days 24 hrs |

****

 5 4 1

 6 3 6

 4 5 5

 3 1 6

169.0 582.8 2026.8

 90. 4.0

 11 7.58

 .81 4252

 417 200.6

 2.80 x 103 1100

 160

**Introduction to Chemistry Review**

**Density Practice**

 d = .196/100 d = 1.96 x 10-3 g/mL

d = 89.6/10 d = 8.96 g/cm3

10.5 = m/5 m = 52.5 g

V = 3 x 3 x 3 = 27 cm3 d = 27/27 = 1 g/cm3

.88 = 4.4/v v = 5 mL

19.3 = m/5 m = 96.6 g

GOLD: 19.3 = m/10 SILVER: 10.5 = m/10

 193 g = m HEAVIER 105 g = m

**Introduction to Chemistry Review**

1. **Match the following terms with their definition.**

 3 A. Constants 1. using data to reach a conclusion

 5 B. Hypothesis 2. an explanation tested over a long period of time

 2 C. Theory 3. factors in an experiment that stay the same for all groups.

 7 D. Observation 4. a system of guidelines for problem solving

 6 E. Variables 5. an educated guess

 4 F. Scientific Method 6. the factor in an experiment that is tested

 1 G. Analysis 7. using the senses to gain information about the world

1. **Complete the following conversions.**

1. 123 mL = 0.123 L

2. 789 km = 7.89 x 107 cm

3. 34 kg = 34,000 g

4. Which is larger? (Circle one) 55 cm or 5.5 m

5. Which SI unit is used to measure mass? kg .

6. Which unit would you use to measure a football field? Km (or meter) .

1. **Determine the percent error in the following problems:**

1. Experimental value: 1.24 kg

 Accepted value: 1.30 kg Ans. 4.6% .

1.30-1.24 x 100

 1.30

1. Observed value: 252 mL

True value: 225 mL Ans. 12%

252-225 x 100

 225

1. Observed value: 1.24 x 10-3 g

True value: 9.98 x 10-3g Ans. 88% .

1.24 x 10-3 - 9.98 x 10-3 x 100

 9.98 x 10-3

1. Experimental value: 5.2 x 105 g

Accepted value: 1.2 x 105 g Ans. 333% .

5.2 x 105 – 1.2 x 105 x 100

 1.2 x 105

1. **Using the density formula find the unknown.**
2. A block of aluminum occupies a volume of 15.0 mL and weighs 40.5 g. What is its density?

D = 40.5/15 d = 2.7 g/mL

1. What is the weight of the ethyl alcohol that exactly fills a 200.0 mL container? The density of ethyl alcohol is 0.789 g/mL.

.789 = m/200 m = 157.8 g

1. A rectangular block of copper metal weighs 1896 g. The dimensions of the block are 8.4 cm by 5.5 cm by 4.6 cm. From this data, what is the density of copper?

V = 8.4 x 5.5 x 4.6 d = 1896/212.52

V = 212.52 cm3 d = 8.9 g/cm3

1. 28.5 g of iron shot is added to a graduated cylinder containing 45.50 mL of water. The water level rises to the 49.10 mL mark, from this information, calculate the density of iron. V = 49.10-45.5 d = 28.5/3.6

 V = 3.6 mL d = 7/9 g/mL

1. What volume of silver metal will weigh exactly 2500.0 g. The density of silver is 10.5 g/cm3. 10.5 = 2500.0/v

238 g/cm3 = v

1. **Convert the following to scientific/standard notation:**

1) 0.0005 = 5 x 10-4 6) 0.25 = 2.5 x 10-1

2) 5,050 = 5.05 x 103 7) 1.5 x 103 = 1500

3) 0.0008 = 8 x 10-4 8) 0.0025 = 2.5 x 10-3

4) 4 x 100 4 9) 3.75 x 10-2 = 0.0375

5) 1,000,000 = 1 x 106 10) 5,000 = 5 x 103

1. **Determine the number of significant figures:**

a) \_\_\_4\_\_\_\_\_\_\_ 75.02mm

b) \_\_\_\_2\_\_\_\_\_\_\_ 0.0049 g

c) \_\_\_\_4\_\_\_\_\_\_ 18.90 mL

d) \_\_\_\_\_2\_\_\_\_\_\_ 150 cm

e) \_3\_(0.135)\_\_ 0.0222 x 0.7000 x

 8.702

f.) \_3\_\_(77.5)\_\_\_ 3.42+74.1

g.) \_4\_(725.7)\_ 745.1-12.234-7.2

h.) \_1\_\_(5000)\_\_\_\_\_ 150.4÷0.03