Dimensional Analysis Lab Stations

Out Of The Box STEM

#### Station Material List

Station A: Pencil

Station B: Marble, Balance

Station C: Dry Beans (or something similar) Pyrex Glass Measuring Cup

Station D: None

Station E: Spare change greater than \$1

Station F: None

Station G: Stopwatch

Station H: Rice, Measuring Spoons

Station I: Pennies, Scale

Station J: 3 Different Objects, Ruler

Station K: Daily Temperature

Station L: 3 Beakers, Water, Food Coloring

# Station A: Length

- 1) Measure your pencil/pen in centimeters. Record your answer.
- 2) Convert the length in centimeters to inches (2.54 cm = 1 inch).
- 3) Convert the length in centimeters to the length in kilometers. (10,000 cm = 1 km)
- 4) What is the best unit to use? Why?

# Station B: Money

- 1. How much money (in dollars) is on the table? Record.
- 2. Convert to Euros (1 US dollar = 0.90 Euros)
- 3. Convert to Indian Rupee (1.12 US dollar = 75.07 Indian Rupee)
- 4. Convert to Australian dollars (1.12 US dollar = 1 AUD)
- 5. Do you have "more money" in another country if the number is different? Why or why not?

# Station C: Ancient Egypt

- 1) Measure your height in centimeters. Record.
- In Ancient Egypt, 1 *djeba* ∮equals 1.875 cm. Convert your height to to *djeba*.
- 3) In Ancient Egypt, 1 *meh nedjes* equals 45 cm. Convert your height to *meh nedjes*4) Does this system remind you more of the metric system or standard system? Why?

## Station D: Time

- 1. Record how many seconds it takes you to walk from this station to the door and back. Record.
- 2. Convert seconds into minutes (60 seconds = 1 min)
- 3. Convert the minutes into hours (60 minutes = 1 hour)
- 4. How many times could you walk across the room in 1 hour (1 hour / answer to #3)
- 5. What is the best unit to use in this situation?

## Station E: Volume

- 1. Measure 3 tablespoons of beans into the beaker.
- Convert the number of tablespoons of beans into teaspoons (3 teaspoons = 1 tablespoons)
- 3. There are 16 tablespoons in 1 cup. How many cups of beans do you have in your beaker?
- 4. Double the amount of beans in the beaker. How many cups do you have now?

\*Pour the beans back into the container\*

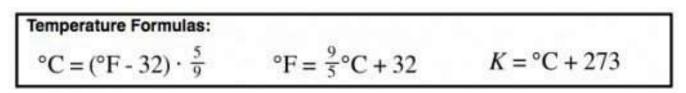
## Station F: Mass/Weight

- 1) There is an unknown amount of pennies in front of you. Mass the pennies in grams.
- 2) Convert the mass of these pennies to kilograms (1000g
  - = 1 kg)
- 3) Each penny is 2.5 grams (1 penny = 2.5 grams). How many pennies are in your stack?
- 4) Convert the mass of the pennies to pounds (1 kg = 2.2 pounds)

## Station G: Temperature

1) Today's temperature is currently \_\_\_\_\_ in Fahrenheit (look it up!)

2)



Use the temperature formulas above to convert your temperature in Fahrenheit to **Celsius and Kelvin**. We cannot use regular dimensional analysis for temperature!

#### Station H: Volume

- 1) Record the volume in mL for each of the three colored liquids.
- 2) Convert the red liquid to liters (1000 ml = 1 liter)
- 3) Convert the blue liquid to pints (473 ml = 1 pint)
- 4) Convert the green liquid to gallons (3785.41ml = 1 gallons)
- 5) How and where do we use these units in everyday life?