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) Convert the pencil length in kilometers to your pencil length in miles (1 km = .612 miles).

Station B: Mass/Weight

1. Mass the marble that is provided. Record your answer.
2. Convert grams to kilograms. (1000 g = 1 kg)
3. Convert the mass of the marble in kg to to pounds (2.2 pounds = 1 kg).
4. Convert the marble in pounds to tons (2000 pounds = 1 ton)
5. What unit is best to describe the weight or mass of the marble? Why?

Station C: Volume/Mass

1. How many cups of the material are in the measuring cup?
2. Convert to ounces (1 cup = 12 dry ounces)
3. Convert cups to grams (1 cup = 340 grams)
4. What unit is best to use in this situation? Why?

Station D: Length

1. Measure the length of your arm in centimeters. Record.
2. What is the length of your arm in meters? (100 cm = 1 m)
3. What is the length of your arm in kilometers? (1 km = 1000 m)
4. Convert the length of your arm in kilometers to miles (1 km = .612 miles).
5. Convert the length of your arm in centimeters to inches (2.54 cm = 1 inch).

Station E: 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 F: Ancient Egypt

1) Measure your height in centimeters. Record.
2) 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 G: 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 H: Volume

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

Pour the rice back into the container

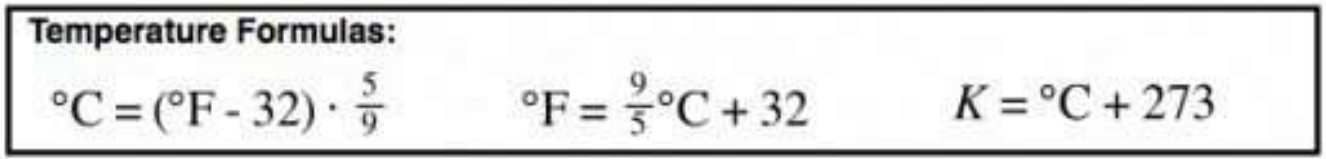
Station I: Mass/Weight

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 J: Length

1) Measure the length of the three objects in front of you and record their length in centimeters.
2) Convert each length to meters. (100 cm = 1m)
3) Convert from centimeters to inches (1 inch = 2.54 centimeters).
4) Which unit is the best to use for these objects?

Station K: 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 L: 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?