

Unit 1A: Extra Practice Sheet

Scientific Method Examples:

So Mythbusters once tested to see whether driving with the air-conditioning on or driving with the windows open would use more fuel on a hot day. They found 3 identical Ford SUVs, transported each of the cars to the starting line of a 2 mile long oval track, and filled each gas tank completely with unleaded gasoline. Each car was going to be driven by one person at 60 miles an hour along the track until it ran out of gasoline and stopped moving. Car A ("Car open windows") driven by Adam, started along the track first. Jamie started to drive Car B ("car air-conditioning") in the exact same manner once Adam had reached 1/3 of the way around the track (.67 miles). Car C ("car no windows down and no air conditioning") was driven by Kari, and was driven in the exact same manner as Car A and Car B. She began her drive when Car A was 2/3 around the track, and Car B was 1/3 around the track. After 2 hours and 54 minutes Car A ran out of gasoline and stopped on the track. Car B ran for another 11 minutes, lasting 3 hours and 5 minutes. Car C drove for 3 hours and 22 minutes before it ran out of gasoline and stopped on the track.*

(*This experiment is not identical to the one that was run on the mythbusters episode. Call me creative I guess.)

1. What is the independent variable in the experiment? <i>Method of cooling the car/vehicle</i>	2. What is the dependent variable in the experiment? <i>How far/long the vehicle travels</i>
3. List 3 constants within this experiment. <i>- Ford SUV - Driving alone</i> <i>- 2 mile long track - Distance from other cars</i> <i>- Unleaded gas/amount - 60 mph</i>	4. What is the control group in this experiment? <i>Car C</i>
5. Identify 1 piece of quantitative data from this experiment. <i>Car B ran 3hr 5min</i>	6. Identify 1 piece of qualitative data from this experiment. <i>Car A was very loud inside</i>
7. Why don't you think each of the cars started at the same time? Why did they start so that they were equally spread out along the track? <i>So that one car didn't drift right behind another car. They each needed same wind/track conditions</i>	8. What would make this experiment BETTER? I mean, what would make me trust the results of this experiment more? <i>Repeat experiment many times.</i>

Mr. Banker loves french fries. They are delicious, they make almost any sandwich or burger better, and they are delicious. Especially the crispy ones. Mr. Banker knows that growing up, he always saw them being fried in vegetable oil when mom (or McDonalds) was making dinner. Mr. Banker would like to know if any other oil would be better for making french fries though. Mr Banker decides to make french fries using 4 different oils: vegetable oil, peanut oil, canola oil, or olive oil. He cuts up 4 large russet potatoes with a french fry cutter, for each type of oil. He then heats the vegetable oil up to 185 degrees F, drops in 30 of the uncut french fries, deep fries them for 6 minutes, pulls out the french fries and puts them onto some paper towel to cool and soak up some of the excess oil, and salts the french fries with a pinch of salt. After allowing them to cool for 5 minutes, he has 4 students taste test the fries and take notes. He repeats this same procedure 3 other times, one for each of the oils. Being that most stoves have 4 burners, he actually does all 4 of the oils at the same time, keeping special care to keep track of which oil goes with which plate.

(* This is not actually how you make french fries. Do not follow these directions, temperatures, or times and expect to get delicious french fries.)

1. What is the control group of this experiment? <i>Vegetable oil</i>	2. List 3 constants from this experiment. <i>- Potato type - 185°F - 6min cook</i> <i>- Fry size - 30 fries - Paper towel cool 5min</i> <i>- 4 tasters</i>
3. What was the independent variable for this experiment? <i>Oil type</i>	4. What was the dependent variable for this experiment? <i>French fry quality/awesomeness</i>
5. Identify 1 piece of quantitative data from this experiment. <i>Peanut oil french fries tasted 7.5/10 on a taste test by taster # 3</i>	6. Identify 1 piece of qualitative data from this experiment. <i>Vegetable oil fries tasted "dry and mushy"</i>
7. What part of the experiment was the taste testing notes from each of the kids? <i>Data</i>	What would make this experiment BETTER? I mean, what would make me trust the results of this experiment more? <i>Do it again. 10 tasters? 500 tasters?</i>

Units!

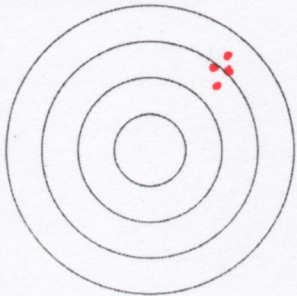
- What are each of the following used to measure?
 - Grams = mass
 - Meters = length
 - Liters = volume
 - Seconds = time
- What are the order of the 7 prefixes you are required to know in order from largest to smallest?

Kilo Hecto Deca BASE UNIT Deci Centi Milli

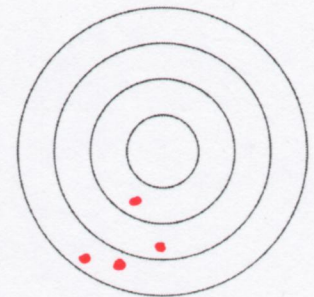
Conversions

- 1085 kilograms = 108,500 decagrams
- 95 millimeters = 0.095 meters
- 0.00123 deciliters = 0.123 milliliters
- 23 grams = 0.23 hectograms
- 7.1 decimeters = 0.071 decameters
- 1 kilometer = 1,000,000 millimeters
- 0.0248 hectograms = 248 centigrams
- 78.21 deciliters = 782.1 centiliters

Accuracy/Precision



Using the picture to the **LEFT**, draw me a set of 4 shots that were precise, but not accurate?



Using the picture to the **RIGHT**, draw me a set of 4 shots that were accurate, but not precise?

HONORS ONLY for the rest of the study guide:

If I give you the scientific notation, you give me the standard number. If I give you the standard number, you give me the scientific notation.

- 3.42×10^4 34,200
- 3.42×10^{-2} 0.0342
- 12,857 1.2857×10^4
- 0.00732 7.32×10^{-3}
- 3.8×10^3 3,800
- 4.2×10^{-4} 0.00042
- 11.586 1.1586×10^1