

1. Suppose you measure something in feet and then find out that you should have measured it in meters: You can "convert" the result from feet to meters, because they are "similar" units. (They are both units of length.) You *cannot* convert it to gallons, because feet and gallons are *not* _____ units.
 - a. The number of meters in your measurement will be _____ than the number of feet, because a meter is a _____er unit than a foot. (greater, smaller) -Have you contradicted yourself? ____
 - b. To convert your result from feet into meters you could multiply the original measured length (in feet) by a "**conversion factor**" which is _____ than 1. (greater, less) -Does 1b contradict 1a? ____
2. Let "Y" represent the length of an object, *in meters*. Let "X" represent the length of that same object, *in feet*. Let "M" represent the conversion factor mentioned in 1b.
 - a. Use those three symbols to write an equation describing their relationship: $Y = \underline{\hspace{2cm}}$
 - b. If you graph that type of equation you always get a _____ line through the _____.
3. Suppose you measure several different lengths in feet *and* in meters. Then you make a graph of **Length in m. vs Length in ft.** It will be a _____ line through the _____, as in #____.
 - a. One meter is between 3.27 and 3.28 feet. Thus the slope of that graph (in decimal form) must be between _____ and _____ per _____. *Please avoid excessive roundoff.*
 - b. If you choose to convert a length from feet into meters by multiplying (as in 1b) you will multiply the length (in feet) by approximately _____ per _____. (Use 1b & 3a above, and #1 on RS I.)
 - c. Whenever you multiply two numbers (as in 3b) you must _____ their units. (That's #__ on RS I.)
4. Suppose some people weigh themselves here on earth and then weigh themselves again on the moon. Each person will weigh less on the moon because the moon's gravity is *weaker* than the earth's.
 - a. On the earth Mr. A is twice as heavy as Ms. B. On the moon Mr. A will be ___ times _____er than B.
 - b. Let " W_e " represent the weight of any object on the earth. (*Weight is gravitational pull.*) Let " W_m " represent the weight of the same object on the moon. Suppose we measure the W_e and W_m values for a lot of different objects and we make a graph of W_m vs. W_e . What will that graph look like?
 - c. Gravity on the moon is *roughly* one-sixth as strong as it is on the earth. Therefore the slope of the graph in 4b is roughly _____. (Use #1 on RS I. *As always, this slope must be in decimal form.*)
5. Using a spring scale, we find that the gravitational pull exerted by the earth on a 6-kilogram object is roughly ____ pounds. According to 4c if you repeat the measurement on the moon you will find that the same six-kilogram object weighs only about _____. *Please show how that was calculated.*
6. Imagine selecting several different objects with masses of 1 kilogram, 2 kg, 3 kg, etc. We weigh them with a spring scale and then we make a graph of **weight vs mass**.
 - a. The graph will be a _____ line through the _____, as in #____, _____, and _____ above.
 - b. If we make the measurements here on the earth its slope will be roughly _____ per ____.
 - c. If we do it on the moon its slope will be about _____ per _____. *Please show how you get this.*
7. Let "W" represent the *weight* of an object. (That's the gravitational pull which the earth exerts on it.) Let "M" represent the *mass* of the object (in kilograms) as measured with a balance. Let "g" represent the *slope* of the graph mentioned in #6. (Notice that it's not a capital letter.)
 - a. Use those letters to write an equation describing that graph: $W = \underline{\hspace{2cm}}$
 - b. Which letter in 7a represents "gravitational pull"? ____ -In what units was "pull" measured in #5? ____
8. In #6 and #7 we learned how to calculate the weight of an object if its mass is known. We used the slope of a linear graph, as in #1 & 2, but there is one important difference. We *don't* call it "converting" this time, because kilograms and pounds are *not* similar units. (See #1.)
 - a. Pounds are units of _____, which is measured with a _____, as in #6 and #____.
 - b. Kilograms are units of _____, measured with an entirely different instrument called a _____.
 - c. The value of "g" is not the same everywhere. In #5 we saw that it depends on the local strength of _____. In 6b we found that the "g" value *here* is roughly _____ *Does #7 agree?* ____
 - * d. That constant "g" has slightly different values at different locations on the earth. Copy the greatest and smallest values (with units) and the corresponding geographic locations from your textbook.
 - e. Use the *full name* of that quantity in 8d & f. (Copy it from that same page, or from the book's index.)
 - * f. Copy the numerical value of "g" (with units) which is most likely to be correct at our location.
 - * g. Give the page number where you found the information. (Notice that standard international units are used in the book. Apparently the SI unit of *weight* or *pull* must be the "_____".)
 - h. The discoveries in #7 & 8 have been recorded for future reference in #__ on the Ch. I Review Sheet..