Conversion problems worksheet chemistry

Section 11 = Solutions and their Properties.

↳ most substances we encounter are mixtures - wood, gas, milk, champagne, air, steel, etc...

↳ when the components are uniformly intermingled or mixed, the homogeneous mixture is a solution.

⊛ Solution Composition.

↳ solutions can be dilute or concentrated, but we need to define "solution composition" more precisely to do calculations.

↳ there are several methods for determining a solution's concentration.

① Molarity → $M = \frac{\text{moles solute}}{\text{L solution}}$ ⇒ 1M = 1 mol/L

"molar"

② Molality → $m = \frac{\text{moles solute}}{\text{kg solvent}}$ ⇒ 1m = 1 mol/kg

"molal"

③ Mass Percent → $\frac{\text{mass solute}}{\text{mass solution}}(100\%)$

④ Mole Fraction → $\chi_{\text{solute}} = \frac{\text{moles solute}}{\text{moles of solution}}$

⑤ Normality → $\frac{\text{\# of equivalents}}{\text{L solution}} = N$

"normal"

METRIC CONVERSIONS

V. Fill in the blanks with the correct metric equivalent.

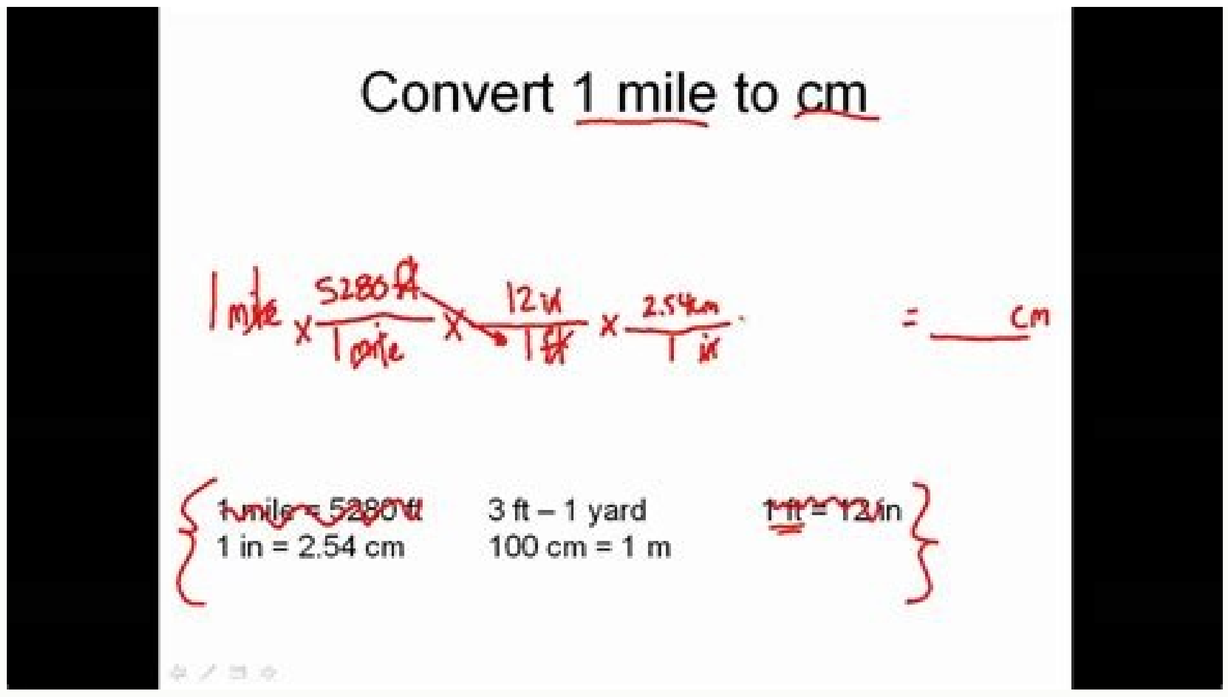
1. 1000 g = 1 _____
2. 0.1 g = 1 _____
3. 100 g = 1 _____
4. 10 g = 1 _____
5. 0.001 g = 1 _____
6. 0.01 g = 1 _____
7. 10.0 m = 1 _____
8. 1000 m = 1 _____
9. 0.001 m = 1 _____

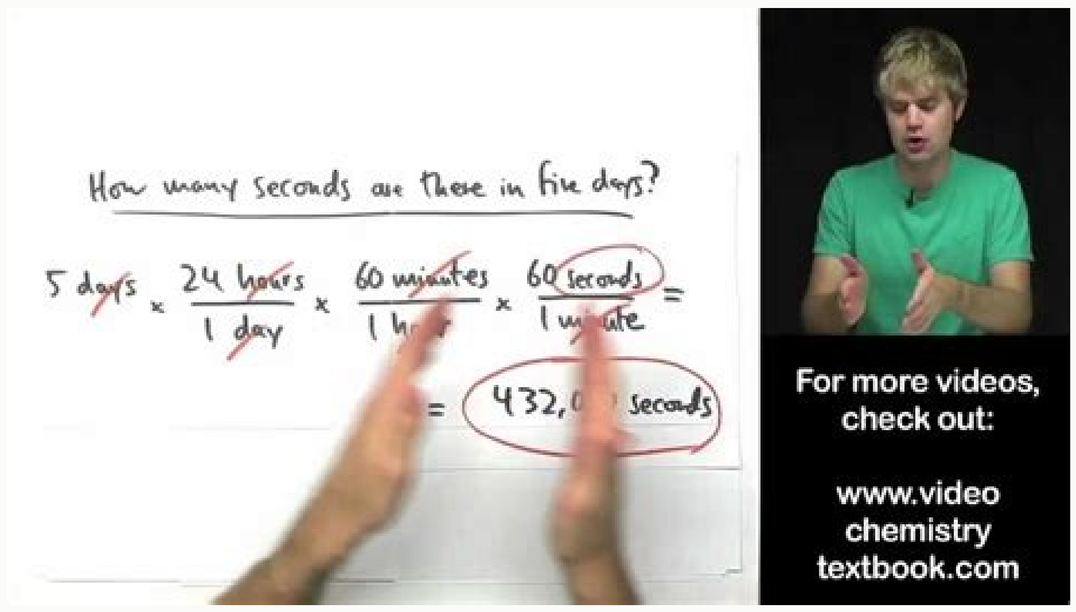
VI. Convert the following metric numbers. (Remember: DO NOT drop final zeroes from your numbers.)

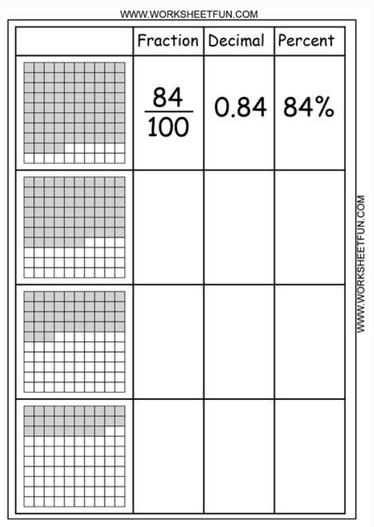
10. 20 mg = _____ g
11. 23,456 g = _____ kg
12. 14 g = _____ cg
13. 2.3 mg = _____ g
14. 70 cg = _____ g
15. 45 g = _____ mg
16. 2.6 kg = _____ g
17. 0.5 g = _____ dg
18. 0.004 kg = _____ g
19. 1×10^{3} m = _____ km
20. 1×10^{-3} m = _____ mm
21. 55 m = _____ cm
22. 4.5 cm = _____ mm
23. 0.89 mm = _____ m
24. 0.005 m = _____ mm
25. 1.14 L = _____ cm^3
26. 15 mL = _____ cm^3
27. 1.40 cL = _____ cc
28. 0.015 hL = _____ L
29. 8.2 mL = _____ L
30. 2,000 kg = _____ g
31. 0.053 g = _____ mg
32. 0.0512 cg = _____ kg
33. 101.53 eg = _____ g
34. 540,000 mg = _____ g
35. 45,000 cm = _____ km

VII. Solve the following equations. Be sure to convert all units to the same base! Show your work.

36. 16 g - 50 mg = _____ g
37. 0.017 L - 17 mL = _____ mL
38. 320 mm + 5.4 cm + 1.689 m = _____ m
39. 53 cm + 3 m = _____ mm
40. 0.054 g - 54 mg = _____ g







Chemistry 3.3 conversion problems worksheet answers. 3.3 solving conversion problems worksheet answers chemistry. Chemistry conversion problems worksheet. Chemistry conversion word problems worksheet. Conversion rules 2016. Chemistry mole conversion practice problems worksheet with answers. Unit conversion word problems worksheet with answers chemistry. What is conversion rate in chemistry.

Conversions require only basic math, but they're very useful calculations to know how to do: even in an era of convenient online calculators, being able to do quick mental conversions is useful for completing household tasks. In the classroom, it can be helpful to ask students for estimations. For instance, ask a student something like: do you think 10 tablespoons is closer to one cup or one gallon? Their response gives you great insight into their understanding of conversions. The worksheets below include basic conversions that will be helpful if a student is struggling with the concept. Answers are provided. Other Worksheets Involving Calculations! These worksheets are in *.pdf format or as Microsoft Word files. If you don't have MS Word, you can download the latest version of the Adobe Acrobat reader for free by clicking HERE. . Description of the Worksheet Web Page pdf format MS Word Unit Conversions Worksheet: Problems with metric-nonmetric conversions? This will fix your problems! PRA016 PRA016 Molar mass practice worksheet: Practice doing molar mass calculations in the comfort of your own home! PRA001 PRA001 PRA001 Percent Composition Worksheet: Practice finding elemental compositions of compounds. PRA023 PRA023 SI Units and Unit Conversions: Practice your metric units and how to convert them to other units! summer2 summer2 Mole calculations practice worksheet: Convert between grams, moles, and molecules! PRA010 PRA010 PRA010 More Mole Calculations: Just what it sounds like! PRA050 PRA050 PRA050 All worksheets (c) 2000-2003 Cavalcade Publishing. All Rights Reserved. Please address all inquiries to misterguch@chemfiesta.com Jon Feingersh Photography Inc / Getty Images Skip to Main ContentSkip to Navigation Math You Need > Unit Conversions > Unit Conversions Practice Problems Jump down to:Density | Scale If you do not have a list of common conversion factors in your book, you may wish to download and print this sheet of common conversion factors for the geosciences (Acrobat (PDF) PRIVATE FILE 40kB Sep3 09). open the link below to use while you make your calculations. If you need a reminder of the steps, you can download and print this worksheet (Acrobat (PDF) PRIVATE FILE 44kB Apr11 08) walking you through the steps for unit conversion. Finally, you can download a sheet that has all the problems (Acrobat (PDF) 48kB Jul25 09) on it so you can print it out and work them on your own. Problem 1:Imagine that you are driving your car in Canada. As you're driving along, you notice that the speed limit signs have numbers like 120 (on the highway) and 50 (in the city). As you start to speed up, you realize that the signs are in km/hour. Unfortunately, your speedometer only reads in mi/hour. Figure out how fast you're allowed to go if the sign says: 120 km/hr Hide Let's do this using the steps you learned in the previous page. Write out the units you have (when appropriate as a fraction): Hide Write out the units you want to end with: Hide Determine appropriate conversion factors (in some cases, there will be more than one conversion factor for each of the units you have): Hide Since "hours" stays the same on the bottom, you only need one conversion factor: km to mi. So, you can write 1km = 0.6214 mi Evaluate appropriate arrangement for fractions (that is, what units belong in numerator (top) of fraction? What units need to be in denominator (bottom)? Remember, units cancel when one unit is in numerator and the other is in the denominator). Remember that when you multiply fractions (as you will in step 6 below), you can cancel units ONLY when they appear in both the numerator and the denominator. Hide Since km is in the numerator in the original units, km needs to be in the denominator so that we can cancel: Set up the conversion by writing the fractions in a row with multiplication signs in between: Hide Evaluate. Do the original units cancel so that you are left with ONLY the units asked for? If not, repeat steps 3 and 4 until you are left with appropriate units: Hide We cancel km and end with mi/hr (which is what we want!) Multiply across top and bottom: Hide If necessary, reduce the fraction. Hide Evaluate your answer. Hide Is a speed limit of about 75 mph (mi/hr) a reasonable speed limit? If you got 0.75 or 75,000, would you recognize that it is not reasonable? 75 km/hr Hide Write out the units you have (when appropriate as a fraction): Hide Write out the units you want to end with: Hide Determine appropriate conversion factors (in some cases, there will be more than one conversion factor for each of the units you have): Hide Since "hours" stays the same on the bottom, you only need one conversion factor: km to mi. So, you can write 1km = 0.6214 mi Evaluate appropriate arrangement for fractions (that is, what units belong in numerator (top) of fraction? What units need to be in denominator (bottom)? Remember, units cancel when one unit is in numerator and the other is in the denominator). Remember that when you multiply fractions (as you will in step 6 below), you can cancel units ONLY when they appear in both the numerator and the denominator. 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You can drive approximately 45 miles per hour 50 km/hr Hide Write out the units you have (when appropriate as a fraction): Hide Write out the units you want to end with: Hide Determine appropriate conversion factors (in some cases, there will be more than one conversion factor for each of the units you have): Hide Since "hours" stays the same on the bottom, you only need one conversion factor: km to mi. So, you can write 1km = 0.6214 mi Evaluate appropriate arrangement for fractions (that is, what units belong in numerator (top) of fraction? What units need to be in denominator (bottom)? Remember, units cancel when one unit is in numerator and the other is in the denominator). Remember that when you multiply fractions (as you will in step 6 below), you can cancel units ONLY when they appear in both the numerator and the denominator. 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From travel times of earthquake waves, we also know that the average density of the Earth is about 5.5 g/cm3. See if you can do some unit conversions using information given in the questions below to determine whether the whole Earth could be made of these two rock types only. As an astute observer walking around on continental crust (granite), you might decide to test the hypothesis that the Earth is made entirely of granite. You weigh a 1.00 cubic ft piece of granite on your home scale and find that it weighs 171 lbs. Thus you determine that the granite has a density of 171 lb/ft3. Convert your granite's density to g/cm3. Given the information above, could the earth be made completely of granite? Hide Let's go through this using the steps from the Unit Conversions Page. Copy the number and units as a fraction: Hide Because the block of granite is 1 cubic foot, you can put 1 on the bottom of the fraction. Write out the units you want to end with: Hide Look up the conversion factors for what you have (pounds and feet(or cubic feet)) to what you want (grams and cm (or cubic cm)). Hide pounds to grams: 1 lb = 453.3924 g feet to cm: 1 foot = 30.48 cm feet to cubic feet: 1 ft * 1 ft * 1 ft = 1 ft3 cubic feet to cubic centimeters: 1 ft3 = 30.48 cm * 30.48 cm * 30.48 cm = 28,316 cm3 Take note of what you have and what you want to end up with. Then, write out conversion factors from step 2 as fractions so that units cancel. Hide You want to be able to cancel lb (so that unit has to be on the bottom of the converting fraction) and ft3 (so that unit has to be on the top of the converting fraction): Once you have written all the conversion fractions so that the original value is being multiplied by them (see last step), evaluate. Do the original units cancel so that you end up with what the question is asking for? Hide Multiply the fractions (across the top and bottom): Hide Divide the resulting number to get an answer. Hide Is this a reasonable answer? Hide This isn't the answer we were looking for - 5.5 g/cm3. But it is within an order of magnitude. It is also a number that is greater than the density of water (which is 1 g/cm3) and we know that granite is denser than water! So it's a reasonable number. However, it shows that the Earth cannot be made completely of granite! Given that basalt seems to well up when ocean crust pulls apart at Mid-Ocean ridges, you might decide that maybe the entire Earth is made of basalt. On your bathroom scale, a 64 in 3 (4in x 4in x 4in) block of basalt weighs 116 ounces. Use this information to calculate whether the average density of the Earth (5.5 g/cm3) can be explained by an Earth made completely of basalt. Hide Let's go through this using the steps from the Unit Conversions Page. Copy the number and units as a fraction: Hide Write out the units you want to end with: Hide Look up the conversion factors for what you have (pounds and feet(or cubic feet)) to what you want (grams and cm (or cubic cm)). Hide oz to grams: 1 oz = 28.349523 g in to cm: 1 inch = 2.54 cm inches to cubic inches: 1 in * 1 in * 1 in = 1 in3 cubic in to cubic centimeters: 1 in3 = 2.54 cm * 2.54 cm * 2.54 cm = 16.4 cm3 Take note of what you have and what you want to end up with. Then, write out conversion factors from step 2 as fractions so that units cancel. Hide You want to be able to cancel oz (so that unit has to be on the bottom of the converting fraction) and in3 (so that unit has to be on the top of the converting fraction): Once you have written all the conversion fractions so that the original value is being multiplied by them (see last step), evaluate. Do the original units cancel so that you end up with what the question is asking for? Hide Multiply the fractions (across the top and bottom): Hide Divide the resulting number to get an answer. Hide Is this a reasonable answer? Hide This isn't the answer we were looking for - 5.5 g/cm3. But it is within an order of magnitude. It is also a number that is greater than the density of water (which is 1 g/cm3) and we know that basalt is denser than water (it sinks)! So it's a reasonable number. However, it shows that the Earth cannot be made completely of basalt either! So, there must be something denser down there - like the iron/nickel core! Problem 3:You are working with a map that has a fractional scale of 1:24,000 (meaning that 1 unit on the map is equal to 24,000 units on the ground - 1mm = 24,000 mm or 1 in = 24,000 in). See if you can determine solutions to the following problems that geologists face when working with maps. You are hiking to a field area and measure the length of the trail as 18.5 inches. Calculate how many miles you have to hike to get to the interesting rocks/geology? Hide This is actually a two step conversion problem. First you have to convert your map measurements to measurements on the ground. Then you can convert to units that you understand. First, think about what you have (18.5 in on the map and a scale) and what you want to know (how many miles 18.5 inches represents on the ground). It may help to think about inches on the map and inches on the ground as different units. To begin, write the fractional scale as a fraction (with the distance on the ground on top (since that is what we want to ultimately end up with)). You have just calculated how many inches you have to cover on the trail. But, that's just seems like a lot, so let's convert those inches to miles! First, let's write out the appropriate conversion factors: 1 foot = 12 inches and 1 mile = 5280 feet. Next, we have to write these conversion factors as fractions. Remember to arrange them so that units you don't want cancel and you end up with units that you do want! Then we can cancel units. Do we end up with miles? Yes! Now we multiply across the top and bottom (note that the bottom number doesn't have any units because both are canceled by others): And when we clear fractions: We find that our hike will be 7 miles! Once you get to your field area, you are going to create a geologic map of that area. You have a mechanical pencil that has a lead that is 0.3 mm thick. The smallest feature you can map will be something that is 0.3 mm wide on the map. How wide (in m) can that feature be? Hide This, like 3.1 is actually a two step conversion problem. First you have to convert your map measurements to measurements on the ground. Then you can convert to units that you understand. First, think about what you know (0.3 mm on the map and a scale) and what you want to know (how many meters 0.3 mm represents on the ground). It may help to think about mm on the map and mm on the ground as different units. To begin, write the fractional scale as a fraction (with the distance on the ground on top (since that is what we want to ultimately end up with)). You have just calculated how many millimeters thick a feature can be. But, because this is the metric system, we can modify that so that you don't have to keep a lot of zeros in your head. First, let's write out the appropriate conversion factors: Next, we have to write these conversion factors as fractions. Remember to arrange them so that units you don't want cancel and you end up with units that you do want! Finally, cancel the appropriate units (mm in this case) and multiply across the top and bottom. You can map any feature wider than 7.2 m. Hide The cool thing about the metric system is that it is based in the number 10. This means that conversions within the metric system involve moving zeros around. It also means that when doing calculations, many times you can cancel out zeros. How does this work? Zeros can only be canceled if they occur on the top and bottom of a fraction. In the problem above, you can cancel two zeros on either side of the fraction: Note that the calculation then becomes 72 divided by 10. Most of us can easily divide by 10, making this calculation much easier. In fact, when you get to that point, you may not even need a calculator. Keep this in mind as you do calculations! Now you have an idea of the size of features that can be drawn on your map. Convert your answer in problem 3.2 to feet. Hide This is a simple conversion with only one step. The conversion factor listed in the table (see link above) is 1 m = 3.281 feet. First let's set up our equation with fractions: Then cancel units and multiply top and bottom You can map a feature that is about 24 feet wide. Next Steps Okay, I am ready to try the assessment. Take me there!. When you get there, remember to log in with your username and your password. Still need more practice? There are numerous websites that have practice problems for unit conversions. Several of them are listed below. Please use these links for more practice with unit conversions! « Previous Page Next Page »

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