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How to do conversion factors

Find the conversion factor. A conversion factor is the number or formula you need to convert a measurement in one set of units to the same measurement in another set of units. Examples of conversion factors include: 1 gallon = 3.78541 liters (volume) 1 pound = 16 ounces (mass) 1 kilogram = 1,000 grams (mass) 1 pound = 453.592 grams (mass) 1 minute = 60000 milliseconds (time) 1 square mile = 2.58999 square kilometers (area) For example, to change a time measurement from hours to days, use a conversion factor of 1 day = 24 hours. Using the conversion factor to add or subtractThe relationship between units is multiplicative, which is why conversions are done in multiplication and division. If students are really struggling, let them use a conversion calculator or unit converter, but require them to explain the conversion and the calculations that were made. Fractions of an hourRemember that time is not base 10. Multiply when going up from the denominator to the numerator of the next fraction. A quarter as a fraction is $\frac{1}{4}$ and as a decimal is 0.25, but a quarter of an hour is 15 minutes.For example, 3.5 hours is 3 hours and 30 minutes. Without conversion factors, it would be difficult to compare the results of different experiments or data from different sources. This can be confusing since going from larger to small units is done by multiplying. If you know that there are 3.048 feet in a meter, then you can use that as a conversion factor to determine what the same distance is in meters. To convert 50 g to mg, you would multiply 50 g by the conversion factor (1000 mg/g): 50 g \times 1000 mg/g = 50,000 mg Example Problems Here are a few example problems to demonstrate how to use conversion factors: Convert 20°C to Kelvin (K). Convert 20°C to Celsius degrees (°C). 20°C - 0°C = 20 K (since 0°C is defined as 273.15 K) Convert 20 K to Kelvin: 20 K (no conversion needed, since Kelvin is the unit) Convert 150 N to pN (picoNewtons): Find the conversion factor: 1 N = 1,000,000 pN Apply the conversion factor: 150 N \times 1,000,000 pN/N = 150,000,000 pN Common Conversion Factors Here are some common conversion factors in chemistry: Quantity Conversion Factor to Length (m) 1 m = 100 cm, 1 m = 3.28 ft, 1 m = 39.37 in Mass (g) 1 g = 1,000 mg, 1 kg = 1,000 g Time (s) 1 s = 1,000 ms, 1 min = 60 s Temperature (°C) 0°C = 273.15 K, 100°C = 373.15 K Energy (J) 1 J = 6.24 \times 10¹⁸ eV, 1 kcal = 4.184 kJ Conclusion Conversion factors are a fundamental tool in chemistry, enabling you to compare and calculate between different units of measurement. time in days = time in hours \times (1 day/24 hours) The (1 day/24 hours) is the conversion factor. Providing the table allows students to focus on the relationship instead of trying to remember the conversion rates. The customary units are NOT based on powers of 10. Since there are 60 minutes in 1 hour, there are 120 minutes in 2 hours. Divide 9,000 seconds by 60 : 9,000 \div 60=150 $\text{text { minutes } }$ From minutes to hours, the relationship is dividing by 60. This helps students understand that converting measurements doesn't change the actual amount, it just changes the way it is measured. $\text{quad } 60 \text{ minutes (} 1 \text{ hour)} + \sqrt{\text{, underline{60} minutes (} \underline{1} \text{ hour)} \sqrt{\text{, } 120 \text{ minutes (} 2 \text{ hours)}}$ Each measurement system has their own conversion factors. The metric system is based on powers of 10. Use the zig-zag method: Divide numerator and denominator. Conversion factors are mathematical relationships between different units of measurement. Grade 5 - Measurement and Data (5.MD.A.1)Convert among different-sized standard measurement units within a given measurement system (For example, convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. There are 60 minutes in 1 hour. How does this relate to 5 th grade math? To convert 10 feet to inches, multiply 10 times 12 (the conversion factor) = 120 inchesTo convert 10 feet to yards, multiply 10 \times 1/3 = 3.3333 yards (or 3 1/3 yards) To convert 10 feet to meters, multiply 10 \times .3048 = 3.048 meters To convert 10 feet to centimeters, multiply 10 \times 30.48 = 304.8 centimeters There many different types of measurements that sometimes require conversions: length (linear), area (two dimensional) and volume (three dimensional) are the most common, but you can also use conversion factors to convert mass, speed, density, and force. Give students opportunities to measure items around the classroom or school. From inches to feet, the relationship is dividing by 12. So, 5 $\text{text { hours } } \times 60 = 300 \text{ text { minutes } }$. $\text{begin{align*} 2\text{ text { days } } \times \frac{24\text{ text { hours } }}{1\text{ text { day } }} \end{align*}}$ The conversion factor ($\frac{24\text{ text { hours } }}{1\text{ text { day } }}$) allows you to cancel "days" in the numerator with "days" in the denominator. $\text{begin{align*} 2\cancel{\text{{color{green} text { days } }}} \times \frac{24\text{ text { hours } }}{1\cancel{\text{{color{green} text { day } }}}}$ This leaves you with "hours" in the numerator. Conversion factors are used for conversions within the imperial system (feet, pounds, gallons), within the International System of Units (SI, and the modern form of the metric system: meters, kilograms, liters) or across the two. The conversion of measurement units is taking a given unit, such as a length, capacity, mass or time and showing the same measurement with a different unit. 1 $\text{text { kilogram } } = 1,000,000 \text{ text { milligrams } }$ The conversion factor for kilograms to milligrams is 1,000,000. Convert 9 quarts into pints. For both systems, you can convert units of measurement using conversion factors. We use essential and non-essential cookies to improve the experience on our website. For example, you want to convert the results of an experiment measured in grams (g) to milligrams (mg). For example, say you have a length that is measured in feet and you wish to report on it in meters. In order to convert measurement units: Find the conversion factor. Conversion factors are important because they allow us to compare and calculate between different units of measurement. What are Conversion Factors? An appropriate conversion factor makes calculation quick and easy. Find the conversion factors that will help you step-by-step get to the units you want. So, 400 $\text{mathrm{-cm} } \div 100 = 4 \text{ mathrm{-m} }$. Next, use one of the equivalence statements to make the conversion factor that will allow you to cancel out "days."Hint: Look for the equivalence statement that has "days" in it. To convert from quarts to pints , you need to multiply. A conversion factor changes a measurement from one unit to another, like feet to meters.Conversion factors help convert units like length, area, volume, mass, and more between systems.Examples like 1 gallon to 3.78541 liters show practical uses of conversion factors. The formula used to convert between them is F=C \times (c/cr(9) {5}+32. Figure 2Any time you go up to the next numerator you multiply. From minutes to seconds, the relationship is multiplying by 60. There are two methods to calculate:Method 1: Multiply Numerators and Denominators and then DivideMethod 2: Zig-Zag Method The first method is to multiply everything in the numerator together, and multiply everything in the denominator together, and then divide. $\text{begin{align*} \frac{\text{text {Everything in numerator}}}{\text{text {Everything in denominator}}} = \frac{5000\text{ times } 1\text{ text {day}}}{60\text{ times } 24} = \frac{5000}{1440} = 3.4722\text{ text {...days} } \end{align*}}$ So $\sqrt{5000\text{ minutes} = 3.5\text{ days}}$ (rounded to nearest tenth).The other method to properly calculate several fractions being multiplied together is to use the zig-zag method. Divide 230 meters by 1,000 : 230 \div 1,000=0.23 $\text{text { kilometers } }$ 230 $\text{text { kilometers } } \times 1000 = 230,000 \text{ text { meters } }$ Worksheets with a conversion table are a good way for students to practice converting measurements. Write down the answer. Sometimes, it can also be a good example of needing more than one conversion factor.Example 1How many minutes are in two days?Unless you know the conversion for minutes to days, this takes two conversion factors. The conversion between them is more complicated than the examples shown on this page. The prefixes that come before the SI base units, such as kilo, centi, deci and milli, are used to indicate which power of 10 is involved. For example, it's possible to convert two units of mass (e.g., grams to pounds), but you generally can't convert between units of mass and volume (e.g., grams to gallons). Figure 3This method makes putting the numbers into your calculator very quick. The conversion factor is a number you multiply or divide by to change units. Now that you have arrived at the units you want, do the calculation. $\text{begin{align*} \frac{2\text{ times } 24\text{ times } 60 \text{ text { minutes } }}{1\text{ times } 1} = 2880 \text{ text { minutes } } \end{align*}}$ Thus, $\sqrt{2 \text{ days} = 2880 \text{ minutes}}$.Example 2How many days is 5000 minutes?Here are the equivalence statements that will help you get to the units you want. $\text{begin{align*} 60\text{ minutes} = 1 \text{ hour} \sqrt{24 \text{ hours} = 1 \text{ day} } \end{align*}}$ Use these equivalence statements to create conversion factors in a way that unwanted units will cancel out. From meters to kilometers, the relationship is dividing by 1,000. Fahrenheit is a measurement of temperature. Divide. For example, Below are the conversion factors for meters. The zig-zag method says to calculate the numbers going in a zig-zag pattern starting with the first numerator. There are 100 $\sqrt{\text{, cm in } 1 \text{ m} }$. Multiply 2 minutes by 60 : 2 \times 60=120 $\text{text { seconds } }$ 3Write down the answer. Since seconds is the desired unit, you need the conversion factor between minutes and seconds: 1 $\text{text { minute } } = 60 \text{ text { seconds } }$ The conversion factor for minutes and seconds is 60. Once we have the conversion factor, we can convert a quantity given in one unit into an equivalent quantity with a different unit by multiplying it with the correct factor. Each week, our tutors support thousands of students who are at risk of not meeting their grade-level expectations, and help accelerate their progress and boost their confidence. Convert 400 centimeters into meters. Multiply 7 kilograms by 1,000,000 : 7 \times 1,000,000=7,000,000 $\text{text { milligrams } }$ 7 $\text{text { kilograms } } = 7,000,000 \text{ text { milligrams } }$ Convert 9,000 seconds to hours. 10+ questions with answers covering a range of 4th and 5th grade units of measurement topics to identify areas of strength and support! DOWNLOAD FREE Convert 2 minutes to seconds. How to Use Conversion Factors Using conversion factors is a simple and straightforward process. From seconds to minutes, the relationship is dividing by 60. Conversion factors are a fundamental concept in chemistry, and understanding how to use them is crucial for success in chemistry calculations. The same length is 0.3048 meters, and it is also 30.48 centimeters. High Impact Tutoring Built By Math Experts Personalized standards-aligned one-on-one math tutoring for schools and districts Request a demo Here you will learn about the conversion of units including conversions between metric units and between customary units. Because the problem asked for minutes, you still need another conversion factor to cancel out the "hours." The conversion factor ($\frac{60\text{ text { minutes } }}{1\text{ text { hour } }}$) allows you to cancel out "hours" in the numerator with "hours" in the denominator. $\text{begin{align*} 2\cancel{\text{{color{green} text { days } }}} \times \frac{24\cancel{\text{{color{green} text { hours } }}}}{1\cancel{\text{{color{green} text { day } }}}}$ This leaves you with just "minutes" as the only units left. In yards, 1 foot is equal to 1/3 yard (conversion factor of 1 foot to yards is 1/3) so forth. For example, if a study published in a journal reports the melting point of a substance in degrees Celsius, but you want to compare it to the melting point of a similar substance measured in Kelvin, you would need a conversion factor to make the comparison. One foot is 12 inches long, and the conversion factor of 1 foot to inches is 12. Always stop and think about the conversion before deciding which operation to use. Units can be imperial or metric and they can be converted using conversion factors. Then, add the known information and multiply it by the conversion factors: $\text{begin{align*} \left(5000\cancel{\text{{color{green} text { minutes } }} \right) \left(\frac{1\cancel{\text{{color{green} text { hour } }}}}{60\cancel{\text{{color{green} text { minutes } }}} \right) \left(\frac{60\cancel{\text{{color{green} text { minutes } }}}}{1\text{ text { hour } }} \right) \end{align*}}$ Be sure to do the calculations correctly. Multiply 2.5 liters by 1,000 : 2.5 \times 1,000=2,500 $\text{text { milliliters } }$ 2.5 $\text{text { liters } } = 2,500 \text{ text { milliliters } }$ Convert 7 kilograms to milligrams. Multiply the denominator. In chemistry, conversion factors are essential for performing calculations, particularly when comparing the results of different experiments or analyzing data from different sources. Celsius is another commonly used temperature measurement. For example, Below are the conversion factors for capacity (volume) in the customary system. It is a shorthand way to write very large or small numbers based on their power of 10. By following the step-by-step guide above, you can master the art of using conversion factors in your chemistry calculations. With this knowledge, you'll be better equipped to tackle complex chemistry problems and excel in your chemistry studies! Your friends have asked us these questions - Check out the answers! A conversion factor is a number that is used to change one set of units to another, either by multiplying or by dividing. Students will first learn about conversion of measurement as part of measurement and data in 5th grade. To convert from cm to m you need to divide. This is the conversion factor. 60 $\text{text { seconds } } = 1 \text{ text { minute } }$ $\text{quad } \text{quad } 60 \text{ text { minutes } } = 1 \text{ text { hour } }$ The conversion factor for minutes and seconds is 60 , and the conversion factor for minutes and hours is 60. Note that following the equal sign, the units for hours cancel out, leaving only the unit for days. So, 9 $\text{text { quarts } } \times 2 = 18 \text{ text { pints } }$. Multiply or divide by the conversion factor. These videos illustrate the lesson material below. Why are Conversion Factors Important? There are 2 $\text{text { pints } }$ in 1 $\text{text { quart } }$. 2 $\text{text { minutes } } = 120 \text{ text { seconds } }$ Convert 180 inches to feet. Remember, the two values must represent the same quantity as each other. For example, $\text{begin{aligned} & 1 \text{ text { foot } } = 12 \text{ text { inches } } \\\\ & 3 \text{ text { feet } } = 1 \text{ text { yard } } \\\\ & 1,760 \text{ text { yards } } = 1 \text{ text { mile } } \end{aligned}$ For both systems, you can convert units of measurement using conversion factors. Learn how to quickly convert between measurement units using this handy conversion-factor chart and some simple algebra! Learn how to use conversion factors, and see examples that walk through sample problems step-by-step for you to improve your physics knowledge and skills. Look at the relationship in the original conversion. Represent and interpret data Ratio Proportion At Third Space Learning, we specialize in helping teachers and school leaders to provide personalized math support for more of their students through high-quality, online one-on-one math tutoring delivered by subject experts. Watching the videos is optional. Time is one of the most commonly used conversions. Divide 180 inches by 12 : 180 \div 12=15 $\text{text { feet } }$ 180 $\text{text { inches } } = 15 \text{ text { feet } }$ Convert 2.5 liters to milliliters. For example, How many minutes are there in 5 hours? You can use the following equivalence statements to make the conversion factors.(1 $\sqrt{\text{, day} = 24 \text{ hours}}$)(1 $\sqrt{\text{, hour} = 60 \text{ minutes}}$)First, start with known information, which is 2 days. Please read our Cookies Policy for information on how we use cookies and how to manage or change your cookie settings.AcceptPrivacy & Cookies Policy How to Do Conversion Factors in Chemistry: A Step-by-Step Guide What are Conversion Factors in Chemistry? In this case, enter the following into your calculator going from left to right: $\text{begin{align*} 5000\div 1 \times 1 \div 60\text{ times } 1 \div 24 = 3.4722\text{ text {...} } \end{align*}}$ If you round to the nearest tenth, this means $\sqrt{5000\text{ min} = 3.5\text{ days}}$.There must be a unit in the denominator and the same unit in the numerator of the next fraction for the units to cancel out.When calculating, use one of the following methods:Multiply the numerator. Using addition or subtraction will lead to the incorrect answer. In this article, we will explore the concept of conversion factors, how to use them, and provide a step-by-step guide on how to apply them in chemistry problems. Multiply or divide by the conversion factor. Find the conversion factor. Thinking the conversion factor of area is the one dimensional factorArea is a two-dimensional measurement and therefore does not convert in the same way as one-dimensional measurements.For example, 1 $\text{text { meter } } = 100 \text{ text { centimeters } }$, but 1 $\text{text { square meter } } \neq 100 \text{ text { square centimeters } }$ 1 $\text{text { yard } } = 3 \text{ text { feet } }$, but 1 $\text{text { square yard } } \neq 3 \text{ text { square feet } }$ Thinking the conversion factor of volume is the one dimensional factorVolume is a three-dimensional measurement and therefore does not convert in the same way as one-dimensional measurements.For example, 1 $\text{text { meter } } = 100 \text{ text { centimeters } }$, but 1 $\text{text { cubic meter } } \neq 100 \text{ text { cubic centimeters } }$ 1 $\text{text { foot } } = 12 \text{ text { inches } }$, but 1 $\text{text { cubic foot } } \neq 12 \text{ text { cubic inches } }$ The conversion factor between $\text{text { minutes } }$ and $\text{text { seconds } }$ Multiply 4.5 $\text{text { minutes } }$ by 60 : 4.5 \times 60=270 $\text{text { seconds } }$ 4.5 $\text{text { minutes } } = 270 \text{ text { seconds } }$ The conversion factor between $\text{text { ounces } }$ and $\text{text { pounds } }$ Divide 144 $\sqrt{\text{, minutes by } 16}$: 144 \div 16=9 $\text{text { pounds } }$ 144 $\text{text { ounces } } = 9 \text{ text { pounds } }$ Multiply 3,400 $\sqrt{\text{, kilometers by } 1,000}$: 3,400 \times 1,000=3,400,000 $\text{text { meters } }$ 3,400 $\text{text { kilometers } } = 3,400,000 \text{ text { meters } }$ Multiply 5 $\sqrt{\text{, text { gallons } by } 16}$: 5 \times 16=80 $\sqrt{\text{, mathrm{cups} } }$ 5 $\text{text { gallons } } = 80 \text{ text { cups } }$ Divide 2,560 $\sqrt{\text{, text { milliliters } by } 1,000}$: 2,560 \div 1,000=2.56 $\text{text { liters } }$ 2,560 $\text{text { milliliters } } = 2.56 \text{ text { liters } }$ The conversion factor between $\text{text { hours } }$ and $\text{text { minutes } }$ Multiply 5 $\sqrt{\text{, hours by } 60}$: 5 \times 60=300 $\text{text { minutes } }$ The conversion factor between $\text{text { minutes } }$ and $\text{text { seconds } }$ Multiply 300 $\sqrt{\text{, text { minutes } by } 60}$: 300 \times 60=18,000 $\text{text { seconds } }$ 5 $\text{text { hours } } = 18,000 \text{ text { seconds } }$ What is scientific notation? Look at the relationship in the original conversions. Then, write the conversion factor so cross-cancellation can be used to cancel "days". For example, How many minutes are in 2 hours? Figure 1Any time you go down to the denominator you divide. Use this quiz to check your grade 4 to 5 students' understanding of units of measurement. 10+ questions with answers covering a range of 4th and 5th grade units of measurement topics to identify areas of strength and support! DOWNLOAD FREE x Use this quiz to check your grade 4 to 5 students' understanding of units of measurement. This is the conversion factor. Here's a step-by-step guide on how to do it: Step 1: Identify the Units to Be Converted Identify the units of measurement that you want to convert. Hours is a measurement of time. This is a place where students sometimes make mistakes. Divide 150 minutes by 60 : 150 \div 60=2.5 $\text{text { hours } }$ 9,000 $\text{text { seconds } } = 2.5 \text{ text { hours } }$ Convert 230 meters to kilometers. They are used to convert between different units of measurement, such as length, mass, time, and temperature. Confusing when to multiply and divideConverting from a larger unit to a smaller unit (like meter to centimeter) is done by multiplying by 100. Let's say we need to calculate how many inches 4.5ft is. Remember, practice is key, so be sure to try out these examples to solidify your understanding of conversion factors. Conversion of Measurement Units for Time1 minute60 seconds1 hour60 minutes1 day24 hours1 week7 days1 year365 days Using the relationship between each, you can convert between the units of time. With time, once they have seen enough examples, they can begin to solve problems without the additional assistance. Step 2: Find the Conversion Factor Find the conversion factor that relates the two units of measurement. 1 $\text{text { kilometer } } = 1,000 \text{ text { meters } }$ The conversion factor for meters and kilometers is 1,000. This includes having them measure the same item in different units (like a desk in mm, cm and m) or an amount of water in ml and l. Find out how we can help your students achieve success with our math tutoring programs. From liters to milliliters, the relationship is multiplying by 1,000. It is considered the international system of units (SI) - SI units. Step 3: Apply the Conversion Factor Apply the conversion factor to the original value. From kilograms to milligrams, the relationship is multiplying by 1,000,000. You can also use unit conversions for time. The number is usually given as a numerical ratio or fraction that can be used as a multiplication factor. Since feet is the desired unit, you need the conversion factor between inches and feet: 1 $\text{text { foot } } = 12 \text{ text { inches } }$ The conversion factor for inches and feet is 12. The first ... Summary The important points are: Write the conversion as a fraction (that equals one) Multiply it out (leaving all units in the answer) Cancel any units that are both top and bottom Units of measurement let us describe and compare length, weight, area, volume, density and other values. 1 $\sqrt{\text{, crf(1) {2} days is } 1 \text{ day and } 12 \text{ hours. What type of measurement is Fahrenheit? In this case, the conversion factor is } 1 \text{ g} = 1000 \text{ mg. Since milliliters is the desired unit, you need the conversion factor between liters and milliliters: } 1 \text{ text { liter } } = 1,000 \text{ text { milliliters } }$ The conversion factor for liters and milliliters is 1,000. For example, $\text{begin{aligned} & 1 \text{ mathrm{-km} } = 1000 \text{ mathrm{-m} } \\\\ & 1 \text{ mathrm{-m} } = 100 \text{ mathrm{-cm} } \\\\ & 1 \text{ mathrm{-kg} } = 1000 \text{ mathrm{-g} } \\\\ & 1 \text{ mathrm{-cl} } = 10 \text{ mathrm{-ml} } \end{aligned}$ The customary system is an older system of measurements, but it is still used in some places. Arrange conversion factors so that unwanted units cancel out through cross-cancellation. 2Multiply or divide by the conversion factor. Look at the relationship in the original conversion.

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