"Cancel or Keep the Unit"

UNITS

Units can be the difference between buying the right sized clothing, purchasing the proper amount of materials, or understanding how much money you should pay for delicious bowl of pasta.

Since there are different measurement conventions for various applications, we need to understand first what our desired unit is when solving a problem. After that, we need to cancel the units we don't want but keep the unit we do want.

EXAMPLE PROBLEM

Thalia is working for a microchip processing company in Germany on an international internship. She works one shift per day, and every shift is 8 hours. She earns €15 per hour, and the current exchange rate yields $1.31 for each euro. How many dollars does Thalia earn per day at the microchip processing company?

Step 1:   Identify the desired final unit. In this case, the final sentence indicates that we want dollars per day.

Step 2:   Line up each part of the problem next to its "companion." A companion has a similar unit.

Step 3:   There will be a numerator and denominator with each part, and each part needs units.

Step 4:   Arrange numerators and denominators so the units we don't need cancel out. "Per" means division in this case.

Step 5: $\dfrac{1\ \text{shift}}{\text{day}} * \dfrac{8\ \text{hours}}{\text{shift}} * \dfrac{€15}{\text{hour}} * \dfrac{\$1.31}{€1}$

Step 6:   Units that appear on the numerator and denominator will cancel.

Step 7: $\dfrac{1\ \text{shift}}{\text{day}} * \dfrac{8\ \text{hours}}{\text{shift}} * \dfrac{€15}{\text{hour}} * \dfrac{\$1.31}{€1} = \dfrac{\$157.20}{\text{day}}$

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PROBLEM 1

Regina, Danielle, and Jaime all measure sections of a tree that fell over during the last thunderstorm. They have different measurement tools, so Regina measures 4 feet, Danielle measures 3.5 yards, and Jaime measures 50 centimeters. There are 12 inches per foot, 3 feet per yard, and 2.54 centimeters per inch. If Regina wants the total length of the tree to the nearest inch, how long is the tree?

REGINA   DANIELLE   JAIME   TOTAL

_____ * _____ + _____ * _____ * _____ + _____ * _____ =

Why was it necessary to add the three separate measurements together?
Use at least 1 complete sentence.

_____

_____

Why couldn't you add the feet, yards, and centimeters together?
Use at least 1 complete sentence.

_____

_____

_____

PROBLEM 2

Rebecca wants to hire a plumber to fix her shower. The plumber informs her that 1 shower job requires 3 hours of work. The plumber charges $25 per hour, but he will only accept British Pounds as payment. Every British Pound is worth $1.62. How many British Pounds will Rebecca need to pay the plumber for the shower job?

＊   ＊   = _____

Which two units canceled?

_____ & _____

Why is it important to cancel units when solving problems with multiple units? Use at least 2 complete sentences.

_____

_____

_____

_____

_____

_____

_____