

Converting Between Units

Yes, sometimes math is hard. But at other times, like today, it's not that bad. Some students might even admit that it's even helpful.

Exactly how many seconds are there until Christmas? That's a problem I'd like to know the answer to. But it sounds hard, so we'll warm up with a couple of other simple conversions first.

Materials: Calculator

Procedure:

1. Warm-up problem #1: How many seconds are there in a minute? On paper have students set up the problem as shown. It's set up this way because it's easier on the mind to move through it this way.

How many seconds are there in a minute?

$$\frac{1 \text{ minute}}{\quad}$$

This is available as a PowerPoint (see last page).

2. In the second column we'll lead with "minute" in the denominator so we can cancel that with our first unit. There are 60 seconds in a minute, so that goes in the numerator.

How many seconds are there in a minute?

$$\frac{1 \cancel{\text{minute}}}{\quad} \left| \frac{60 \text{ seconds}}{\cancel{\text{minute}}} =$$

3. In the numerator we're left with 1 x 60 and a unit of seconds. Since "seconds" is the unit we want our answer to be in and we're already there, we're done. No sweat (we're trying to build confidence).

How many seconds are there in a minute?


$$\frac{1 \cancel{\text{minute}}}{\quad} \left| \frac{60 \text{ seconds}}{\cancel{\text{minute}}} = 60 \text{ seconds}$$

How many seconds until Christmas?

Equation-

112 days	24 hr.	60 min.	60 sec.

Calculation- $\frac{112 \times 24 \times 60 \times 60}{1} =$



4. In warm-up problem #2 we'll solve how many millimeters there are in a meter.

Column 1 starts with "1 meter". In column 2, we'll get rid of that unit by going from meters to centimeters. Column 3 goes from centimeters to millimeters. Cancel like units as you go. Go slow! If you do this well, students will work ahead of you when we do the Christmas problem (which we want).

How many millimeters are there in a meter?

1 meter	100 centimeters	10 millimeters
	meter	centimeter

How many millimeters are there in a meter?

1 meter	100 centimeters	10 millimeters
	meter	centimeter

$$\frac{1 \times 100 \times 10}{1} = 1,000 \text{ millimeters}$$

5. After all units are cancelled, re-write the numbers so you can see them clearly. Multiply across and divide by 1 for the answer.

6. Now for the biggie. In column 1 start with what you know.

Before this lesson, look at a calendar and count how many days there are until Christmas, and change the "112" on slide 3 to fit your number of days. It also appears 2 times on the last slide.

In column 2 we go from days to hours. Then to minutes and seconds. See how it's just like our first problem, only a few repeated steps longer?

How many seconds until Christmas?

Equation-

112 days	24 hr.	60 min.	60 sec.
	day	hr.	min.

Calculation-

$$\frac{112 \times 24 \times 60 \times 60}{1} =$$



9,676,800 seconds until Christmas!

Come back and visit InteractiveScienceTeacher.com to upgrade this lesson with:

PowerPoint- lead your students through the lesson click-by-click

How many seconds are there in a minute?

$$\frac{1 \text{ minute}}{\text{minute}} \times \frac{60 \text{ seconds}}{1} = 60 \text{ seconds}$$

How many millimeters are there in a meter?

$$\frac{1 \text{ meter}}{\text{meter}} \times \frac{100 \text{ centimeters}}{\text{centimeter}} \times \frac{10 \text{ millimeters}}{\text{centimeter}} = 1,000 \text{ millimeters}$$

How many seconds until Christmas?

Equation-

$$\frac{112 \text{ days}}{\text{day}} \times \frac{24 \text{ hr.}}{\text{hr.}} \times \frac{60 \text{ min.}}{\text{min.}} \times \frac{60 \text{ sec.}}{1}$$

Calculation-

$$\frac{112 \times 24 \times 60 \times 60}{1} =$$

