

Step 4 Explain and demonstrate the conversion process. Answer questions as needed.

Step 5 Students complete the second side of the sheet individually. As they work, the teacher can circulate to answer questions and check work as needed. When the class is finished, check answers together.

Assessment/Evidence

Students will solve equations and label metric conversions correctly.

Adaptations for Beginning Students

Beginning students could work in pairs and utilize a calculator.

Adaptations for Advanced Students

More advanced students could also write each expression using scientific notation.

Teacher Reflection/Lesson Evaluation

This lesson was created by Middletown ABLE.

The metric system is based upon units of ten.

Mnemonic devices These funny sentences can help you remember the order of metric units for common conversions. The first letter of each word is the same as the first letter of the metric prefix.

Kim Hit David [until] David Cried Mama!
King Henry Died [until] Drinking Chocolate Milk
King Henry Died [U] Didn't Care Much

The metric measurements are:

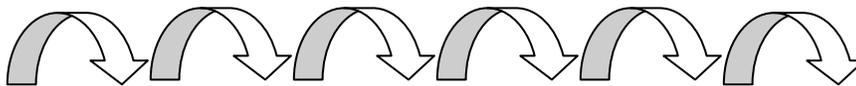
Kilo Hecto Deka [unit] Deci Centi Milli

A Shortcut to Converting from one unit to another:

1. Draw a line and label it with the prefixes as shown in the diagram below. "Unit" will be the unit of measurement you're working with (meter, gram, etc.)

- Kilo-----Hecto-----Deka-----[Unit]-----Deci-----Centi-----Milli.

2. Draw an arrow from the prefix you have to the prefix you want to convert to, making stops at each unit of measure along the way. So if you want to change kilometers into millimeters, for example, then draw a series of arrows from "kilo" to "milli".



- Kilo-----Hecto-----Deka-----["Meters"]-----Deci-----Centi-----Milli.
1,000 100 10 1 0.1 0.01 0.001

3. Determine whether you are converting into a smaller or a larger unit. If the arrow is pointing right, you are converting from a larger unit into a SMALLER one. If the arrow is pointing left, you are going from a smaller unit into a LARGER one.

4. Move the decimal point one digit the same direction as the number of places you found in the previous step. If there is no decimal in the number, assume it's after the last digit in the number.

- For example, when converting from kilometers to millimeters, you will move the decimal point six places to the right. 1 kilometer = 1,000,000 millimeters
- To convert 5 centigrams to grams, you need to move the decimal point two places to the left. 5 centigrams = 0.05 grams

5. Add zeroes as necessary. Only do this if you have run out of digits in the number you were converting.

- For example, to convert 2.5 meters to millimeters, you have to move the decimal point to the right three places. There's only one more digit after the decimal point, so you would need to add two zeroes. Final answer: 2,500 millimeters.

Complete the table with **equivalent** measures:

larger units	→	→	→	→	→	→	→	smaller units
K kilo	H hecto	D deka	[unit]	D deci	C centi	M milli		
	0.01 hectograms		1 gram	10 decigrams				
0.002 kiloliters			2 liters				2,000 centiliters	
	50 hectometers	500 dekameters			500,000 centimeters			

Mathematically, as you move the decimal point one place to the right (moving right on the chart), you are multiplying by 10.

$$1 \text{ meter} \times 10 = 10 \text{ decimeters}$$

As you move the decimal point one place to the left (moving left on the chart), you are dividing by 10.

$$2 \text{ liters} \div 10 = 0.2 \text{ dekaliters}$$

Which is larger? (Circle the larger number in the following pairs.)

- A) 1 decimeter OR 1 meter
- B) 63 kilograms OR 18 grams
- C) 1 liter OR 212 centiliters
- D) 72 centigrams OR 41 dekagrams

Solve the equations.

- A) Eight grams of marijuana were found in the suspect's car. How many centigrams?
- B) The officer chased the suspect approximately 15 hectometers through the field. How many kilometers did the officer run?
- C) Police seized 0.2283 kilograms of crack cocaine from the suspect's home. The estimated value is \$22,830. What is the value of one gram of crack cocaine?

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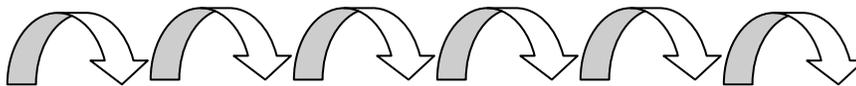
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K kilo	H hecto	D deka	[unit]	D deci	C centi	M milli		
0.001 kilograms	0.01 hectograms	0.1 dekagrams	1 gram	10 decigrams	100 centigrams	1000 milligrams		
0.002 kiloliters	0.02 hectograms	0.2 dekaliters	2 liters	20 decigrams	200 centigrams	2,000 centiliters		
5 kilometers	50 hectometers	500 dekameters	5,000 meters	50,000 decimeters	500,000 centimeters	5,000,000 millimeters		

Mathematically, as you move the decimal point one place to the right (moving right on the chart), you are multiplying by 10.

$$1 \text{ meter} \times 10 = 10 \text{ decimeters}$$

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Solve the equations.

- D) Eight grams of marijuana were found in the suspect's car. How many centigrams?
 $8 \times 100 = 800 \text{ centigrams}$
- E) The officer chased the suspect approximately 15 hectometers through the field. How many kilometers did the officer run?
 $15 \text{ hm} / 10 = 1.5 \text{ kilometers}$
- F) Police seized 0.2283 kilograms of crack cocaine from the suspect's home. The estimated value is \$22,830. What is the value of one gram of crack cocaine?
 $0.2283 \text{ kg} \times 1000 = 228.3 \text{ grams}$ $\$22,830 / 228.3 = \100 per gram