

# Metric System Basics

## Units of Length

Length and distance in the metric system are based on the standard unit called the *meter*. All other metric units for length and distance are multiples or submultiples of the meter. Some of the other metric units of length are shown below.

Name	Abbreviation	Value
kilometer	km	1,000 meters
hectometer	hm	100 meters
dekameter	dam	10 meters
meter	m	1 meter
decimeter	dm	.1 meter
centimeter	cm	.01 meter
millimeter	mm	.001 meter

The metric system is based on the decimal system (base ten). When one unit of measure is compared to the next unit of measure in the metric system, it is 10 times more or 10 times less than the next unit. From this you can see that a meter is 10 times the length of a decimeter, 100 times the length of a centimeter, and 1,000 times the length of a millimeter (10 x 10 x 10).

$$1 \text{ kilometer (km)} = 10 \text{ hectometers (hm)}$$

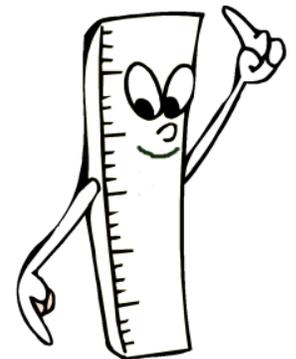
$$1 \text{ hectometer (hm)} = 10 \text{ dekameters (dam)}$$

$$1 \text{ dekameter (dam)} = 10 \text{ meters (m)}$$

$$1 \text{ meter (m)} = 10 \text{ decimeters (dm)}$$

$$1 \text{ decimeter (dm)} = 10 \text{ centimeters (cm)}$$

$$1 \text{ centimeter (cm)} = 10 \text{ millimeters (mm)}$$



Compared to a mile, how long is a kilometer (km)? Below are some of the U.S. units of length converted to metric units of length. This will give you an idea of how the metric units of length compare to the U.S. units of length.

$$1 \text{ inch} = 2.54 \text{ cm}$$

$$1 \text{ foot} = 30.48 \text{ cm}$$

$$1 \text{ yard} = 0.9144 \text{ m}$$

$$1 \text{ mile} = 1.61 \text{ km}$$

# Metric System Basics

## Units of Length

Review page 1 and answer the questions below.

1. What is the base unit of measure for length in the metric system? \_\_\_\_\_
2. How many meters are there in one kilometer? \_\_\_\_\_
3. What number system is the metric system based on? \_\_\_\_\_
4. How many decimeters are there in one meter? \_\_\_\_\_
5. A decimeter is how many more times the length of a centimeter? \_\_\_\_\_
6. How many centimeters are in one meter? \_\_\_\_\_

Draw a line to match the abbreviation to the correct unit of measure.

kilometer	mm
hectometer	cm
dekameter	dm
meter	m
decimeter	dam
centimeter	km
millimeter	hm

Draw a line to match each value to the correct unit of measure.

1,000 meters	centimeter
100 meters	kilometer
10 meters	decimeter
1 meter	millimeter
.1 meter	dekameter
.01 meter	meter
.001 meter	hectometer

# Metric System Basics

## Units of Volume

Volume in the metric system is based on the standard unit called the *liter*. All other metric units of volume are multiples or submultiples of the liter. Some of the other metric units of volume are shown below.

Name	Abbreviation	Value
kiloliter	kl or kL	1,000 liters
hectoliter	hl or hL	100 liters
dekaliter	dal or daL	10 liters
liter	l or L	1 liter
deciliter	dl or dL	.1 liter
centiliter	cl or cL	.01 liter
milliliter	ml or mL	.001 liter

The metric system is based on the decimal system (base ten). When one unit of measure is compared to the next unit of measure in the metric system, it is 10 times more or 10 times less than the next unit. From this you can see that a liter is 10 times more than a deciliter, 100 times more than a centiliter, and 1,000 times the volume of a milliliter (10 x 10 x 10).

1 kiloliter (kl) = 10 hectoliters (hl)

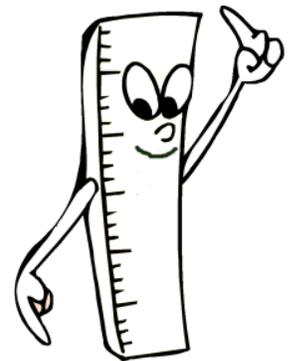
1 hectoliter (hl) = 10 dekaliters (dal)

1 dekaliter (dal) = 10 liter (l)

1 liter (l) = 10 deciliters (dl)

1 deciliter (dl) = 10 centiliters (cl)

1 centiliter (cl) = 10 milliliters (ml)



Compared to a gallon, how much is a liter (l)? Below are some of the U.S. units of volume converted to metric volumes. This will give you an idea of how the metric units compare to the U.S. units.

1 quart = .94 liter

1 gallon = 3.78 liter

1 ounce = 29.57 milliliter

1 pint = .47 liter

# Metric System Basics

## Units of Volume

Review page 3 and answer the questions below.

1. What is the base unit of measure for volume in the metric system? \_\_\_\_\_
2. How many milliliters are there in one liter? \_\_\_\_\_
3. What number system is the metric system based on? \_\_\_\_\_
4. How many deciliters are there in one liter? \_\_\_\_\_
5. A deciliter is how many more times the volume of a milliliter? \_\_\_\_\_
6. How many centiliters are in one liter? \_\_\_\_\_

Draw a line to match the abbreviation to the correct unit of measure.

kiloliter	ml
hectoliter	cl
dekaliter	dl
liter	l
deciliter	dal
centiliter	kl
milliliter	hl

Draw a line to match each value to the correct unit of measure.

1,000 liters	centiliter
100 liters	kiloliter
10 liters	deciliter
1 liter	milliliter
.1 liter	dekaliter
.01 liter	liter
.001 liter	hectoliter

# Metric System Basics

## Units of Weight

Weight in the metric system is based on the standard unit called the *gram*. All other metric units of weight are multiples or submultiples of the gram. Some of the other metric units of weight are shown below.

Name	Abbreviation	Value
kilogram	kg	1,000 grams
hectogram	hg	100 grams
dekagram	dag	10 grams
gram	g	1 gram
decigram	dg	.1 gram
centigram	cg	.01 gram
milligram	mg	.001 gram

The metric system is based on the decimal system (base ten). When one unit of measure is compared to the next unit of measure in the metric system, it is 10 times more or 10 times less than the next unit. From this you can see that a gram is 10 times more than a decigram, 100 times more than a centigram, and 1,000 times more than a milligram (10 x 10 x 10).

$$1 \text{ kilogram (kg)} = 10 \text{ hectograms (hg)}$$

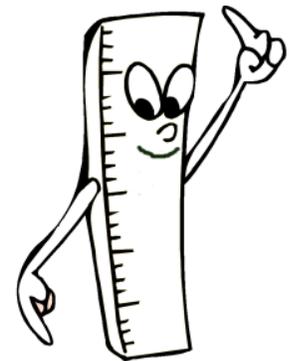
$$1 \text{ hectogram (hg)} = 10 \text{ dekagrams (dag)}$$

$$1 \text{ dekagram (dag)} = 10 \text{ grams (g)}$$

$$1 \text{ gram (g)} = 10 \text{ decigrams (dg)}$$

$$1 \text{ decigram (dg)} = 10 \text{ centigrams (cg)}$$

$$1 \text{ centigram (cg)} = 10 \text{ milligrams (mg)}$$



Compared to an ounce, how much is a gram (g)? Below are some of the U.S. units of weight converted to metric units of weight. This will give you an idea of how the metric units compare to the U.S. units.

$$1 \text{ ounce} = 28.349 \text{ grams} \quad 1 \text{ pound} = 453.592 \text{ grams} \quad 1 \text{ ton} = 907.184 \text{ kilograms (kg)}$$

# Metric System Basics

## Units of Weight

Review page 5 and answer the questions below.

1. What is the base unit of measure for weight in the metric system? \_\_\_\_\_
2. How many milligrams are there in one gram? \_\_\_\_\_
3. What number system is the metric system based on? \_\_\_\_\_
4. How many decigrams are there in one gram? \_\_\_\_\_
5. A decigram is how many more times the weight of a milligram? \_\_\_\_\_
6. How many centigrams are in one gram? \_\_\_\_\_

Draw a line to match the abbreviation to the correct unit of measure.

kilogram	mg
hectogram	cg
dekagram	dg
gram	g
decigram	dag
centigram	kg
milligram	hg

Draw a line to match each value to the correct unit of measure.

1,000 grams	centigram
100 grams	kilogram
10 grams	decigram
1 gram	milligram
.1 gram	dekagram
.01 gram	gram
.001 gram	hectogram

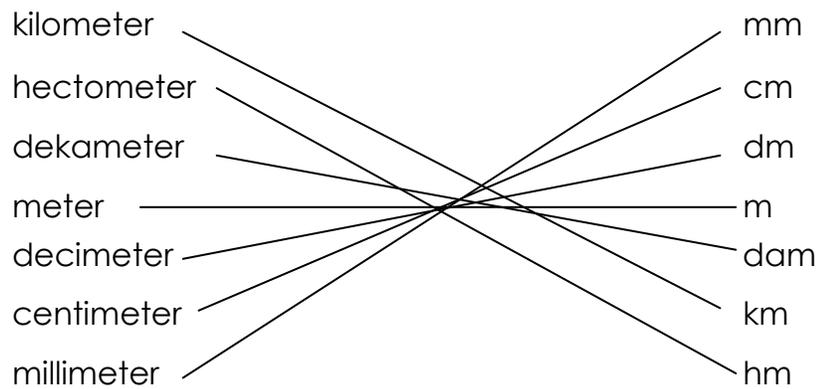
# Metric System Basics

## Units of Length

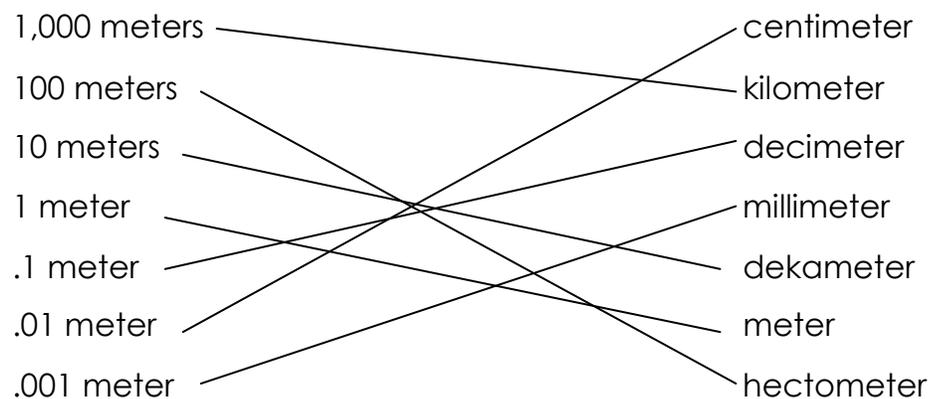
Review page 1 and answer the questions below.

1. What is the base unit of measure for length in the metric system? **meter**
2. How many meters are there in one kilometer? **1,000**
3. What number system is the metric system based on? **decimal**
4. How many decimeters are there in one meter? **10**
5. A decimeter is how many more times the length of a centimeter? **10**
6. How many centimeters are in one meter? **100**

Draw a line to match the abbreviation to the correct unit of measure.



Draw a line to match each value to the correct unit of measure.



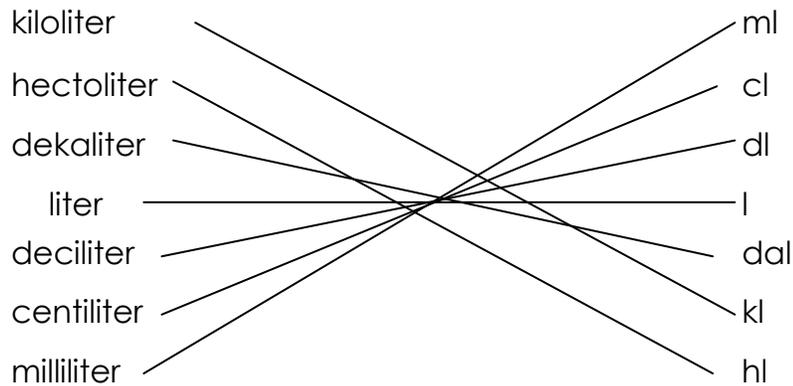
# Metric System Basics

## Units of Volume

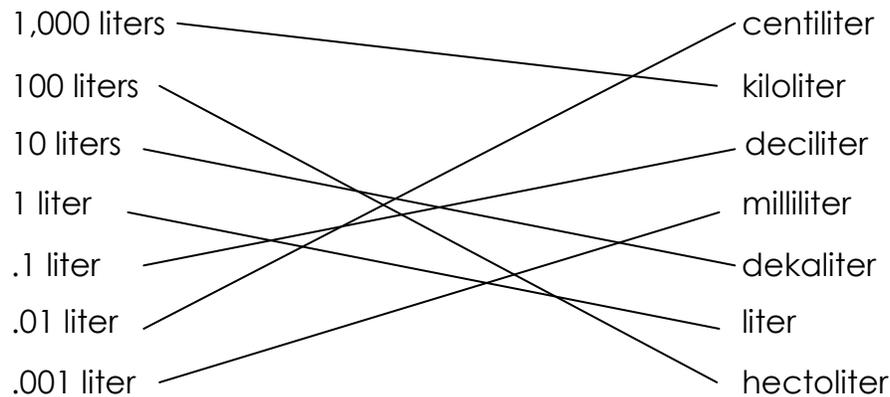
Review page 3 and answer the questions below.

1. What is the base unit of measure for volume in the metric system? **liter**
2. How many milliliters are there in one liter? **1,000**
3. What number system is the metric system based on? **decimal**
4. How many deciliters are there in one liter? **10**
5. A deciliter is how many more times the volume of a milliliter? **100**
6. How many centiliters are in one liter? **100**

Draw a line to match the abbreviation to the correct unit of measure.



Draw a line to match each value to the correct unit of measure.



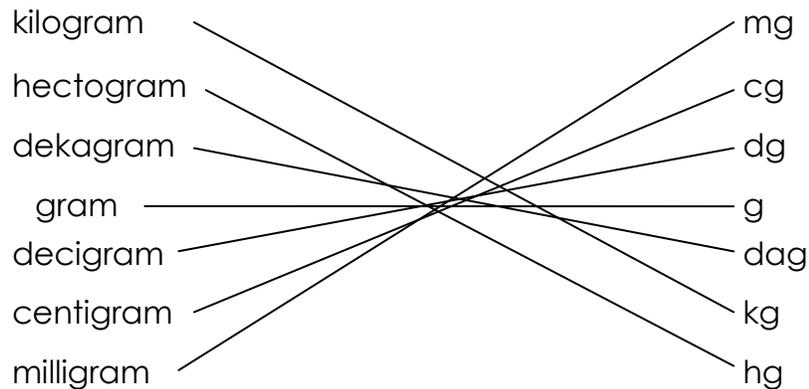
# Metric System Basics

## Units of Weight

Review page 5 and answer the questions below.

1. What is the base unit of measure for weight in the metric system? **gram**
2. How many milligrams are there in one gram? **1,000**
3. What number system is the metric system based on? **decimal**
4. How many decigrams are there in one gram? **10**
5. A decigram is how many more times the weight of a milligram? **100**
6. How many centigrams are in one gram? **100**

Draw a line to match the abbreviation to the correct unit of measure.



Draw a line to match each value to the correct unit of measure.

