

## [60] Two Math Languages

*This lesson is for information only.*

*Metric units are used in Europe and many other countries. The metric system is based on multiples of ten.*

*Standard or customary units are used in the United States, and they have different conversion factors for each measurement type.*

An easy way to understand the concept of metric measurements is to explain it as a different math language. Just as we speak English and other countries speak other languages, so also we use customary or standard measurement units, while other countries use metric measurement units. It is very similar to using two different languages, and we need to be able to use both when we do math.

Unit	Standard or Customary	Abbreviation	Metric	Abbreviation
Length	inch	in	millimeter	mm
	foot	ft	centimeter	cm
	yard	yd	decimeter	dm
	mile	mi	meter	m
			kilometer	km
Weight	ounce	oz	milligram	mg
	pound	lb	centigram	cg
	ton		decigram	dg
			gram	g
			kilogram	kg
Volume	fluid ounce	FL OZ	milliliter	mL
	teaspoon	t or tsp	centiliter	cL
	tablespoon	T or Tbsp	deciliter	dL
	cup	c (or cu)	liter	L
	pint	pt		
	quart	qt	kiloliter	kL
	gallon	gal		
Temperature	Fahrenheit	°F	Celsius	°C

At first it's not important to memorize all of the units; rather, you want to acquaint your child with the idea of the two math languages and to help see the pattern in the metric "language."

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**NOTE:** In this curriculum, upper case L is used as the abbreviation for liter, since the lower case l is too easily confused with the number 1.

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## [61] Introducing Metric Units

Metric units have the same prefixes:

*milli* = 1/1000 parts

*centi* = 1/100 parts

*deci* = 1/10 parts

*kilo* = 1000

*liter* is volume

*gram* is weight (mass)

*meter* is length

This is information that needs to be memorized - however it does not have to be memorized all at once. You can work on memorizing these as you use them in Math

Adventures and in daily life experiences. If your child needs specific practice in memorizing some of these, use the ideas in Math Facts and Memorizing in Math

**Resources.**

**Note:** Gram is actually a unit of mass, not weight. In this curriculum, however, since a metric scale is used to weigh things, the gram is referred to as weight. If you desire, you can teach your child the concept of mass when referring to the gram.

Learning metric units is much easier than learning customary units.

### Three basic metric units and prefixes

- **meter** — measures length:  
*How long something is, or how far away something is.*
- **liter** — measures volume:  
*How much space something takes up, or  
How much liquid there is, such as a 2-liter bottle of soda.*
- **gram** — measures weight (or mass, see note on side):  
*How heavy something is (cereal boxes list the weight of the contents in both ounces and grams).*

Think of each of the three units as being worth one. Each unit can have any of these four prefixes put in front if it to make bigger or smaller units.

- **milli** — divides the basic unit into 1000 parts. It is smaller than the basic unit. It takes 1000 of these to make the basic unit.
- **centi** — divides the basic unit into 100 parts. It is smaller than the basic unit. It takes 100 of these to make the basic unit.
- **deci** — divides the basic unit into 10 parts. It is smaller than the basic unit. It takes 10 of these to make the basic unit.
- **kilo** — 1000 of the basic unit. It is 1000 times larger than the basic unit.

$$1 \text{ meter} = 1000 \text{ millimeters}$$

$$= 100 \text{ centimeters}$$

$$= 10 \text{ decimeters}$$

$$1000 \text{ meters} = 1 \text{ kilometer}$$

$$1 \text{ liter} = 1000 \text{ milliliters}$$

$$= 100 \text{ centiliters}$$

$$= 10 \text{ deciliters}$$

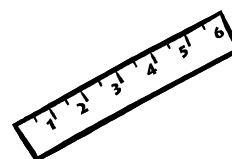
$$1000 \text{ liters} = 1 \text{ kiloliter}$$

$$1 \text{ gram} = 1000 \text{ milligrams}$$

$$= 100 \text{ centigrams}$$

$$= 10 \text{ decigrams}$$

$$1000 \text{ grams} = 1 \text{ kilogram}$$



- 0°C = the temperature at which water freezes.
- 100°C = the temperature at which water boils.