The Metric System

Our Learning Goal:

- The student will be able to accurately measure distance, mass, volume, and density using the metric system.

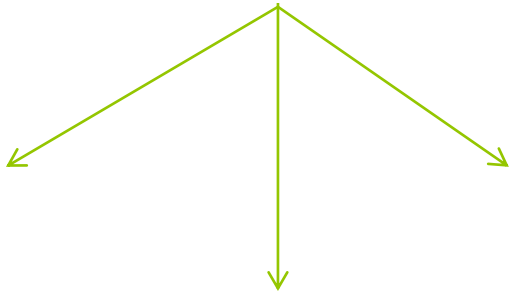
What do you already know about the metric system?

- Talk at your table and be ready to report out your knowledge!

What we already know:

The Metric System

- A ***standard*** unit of measurement used throughout the world that is "based on the 10's"



PREFIXES:

- What do you already know?
- Did your elementary teacher(s) teach you a phrase to remember the metric prefixes?
- Talk at your table and be ready to report out!

PREFIXES: What we know:

PREFIXES:

Kilo → Hecto → deca → ***BASE*** → deci → ***centi*** → ***milli***

UNIT

(meter, liter, gram)

Largest Prefix ⟶ Basic Prefix (m, L, g) ⟶ Smallest Prefix

How do I use this?

Kilo → Hecto → deca → ***BASE UNIT*** → deci → ***centi*** → ***milli***

Largest Objects → Average Objects → Tiny Objects

.001 km = .01hm = .1 dam = 1.0 m = 10 dm = 100 cm = 1,000mm

*****Based on ten! You are multiplying or dividing by 10! Simply move the decimal point left or right!*****

When converting, you need to consider:
How many decimal places are you moving?
In which direction?
NOW, move your decimal that many places in that direction! DONE!

Examples:

Kilo → Hecto → deca → ***BASE UNIT*** → deci → ***centi*** → ***milli***

753 grams = _____ kilograms

4.72 meters = _____ centimeters

34.6 decagrams = _____ decigrams

.562 hectoliters = _____ milliliters

1,389.5 decimeters = _____ hectometers

48.3 decameters = _____ decimeters

Examples:

753 grams = **.753** kilograms

4.72 meters = _____ centimeters

34.6 decagrams = _____ decigrams

.562 hectoliters = _____ milliliters

1,389.5 decimeters = _____ hectometers

48.3 decameters = _____ decimeters

Examples:

753 grams = **.753** kilograms

4.72 meters = **472** centimeters

34.6 decagrams = _____ decigrams

.562 hectoliters = _____ milliliters

1,389.5 decimeters = _____ hectometers

48.3 decameters = _____ decimeters

Examples:

753 grams = **.753** kilograms

4.72 meters = **472** centimeters

34.6 decagrams = **3,460** decigrams

.562 hectoliters = _____ milliliters

1,389.5 decimeters = _____ hectometers

48.3 decameters = _____ decimeters

Examples:

753 grams = **.753** kilograms

4.72 meters = **472** centimeters

34.6 decagrams = **3,460** decigrams

.562 hectoliters = **56,200** milliliters

1,389.5 decimeters = _____ hectometers

48.3 decameters = _____ decimeters

Examples:

753 grams = **.753** kilograms

4.72 meters = **472** centimeters

34.6 decagrams = **3,460** decigrams

.562 hectoliters = **56,200** milliliters

1,389.5 decimeters = **1.3895** hectometers

48.3 decameters = _____ decimeters

Examples:

753 grams = **.753** kilograms

4.72 meters = **472** centimeters

34.6 decagrams = **3,460** decigrams

.562 hectoliters = **56,200** milliliters

1,389.5 decimeters = **1.3895** hectometers

48.3 decameters = **4,830** decimeters

You Try: **Which unit would you use to measure each of these objects? Why?**

(Use only the common prefixes discussed earlier: ***Kilo, base unit, centi, and milli****)*

	OBJECT	UNIT	REASON
Mass (grams)	Cell phone		
	Your body		
Distance (meters)	School to home		
	Toe to heel of your shoe		
Volume (Liters)	Water bottle		
	Water in your pool		

Rate Your Learning on Today's Lesson!

4 = In addition to score 3, you can help teach your peers

3 = you can accurately name the metric prefixes, convert between the metric prefixes, and suggest an appropriate metric prefix to use when measuring an object.

2 = you can accurately do two of the requirements

1 = you can accurately do one of the requirements

0 = you are struggling with all things metric and need more teacher help

Rate Your Learning on the Learning Goal!

4 = In addition to score 3, you can help teach your peers

3 = you can accurately measure distance, mass, and volume using the metric system.

2 = you can accurately do two of the requirements

1 = you can accurately do one of the requirements

0 = you are struggling with all things metric and need more teacher help

The Metric System

Let's talk DISTANCE!

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition			
Unit			
Tool			
Method			

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other		
Base Unit			
Tool			
Method			

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other		
Base Unit	Meter		
Tool			
Method			

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other		
Base Unit	Meter		
Tool	Meter stick or Metric ruler		
Method			

	DISTANCE (width, height, length)	VOLUME	MASS
Definition	How far from one end to the other		
Base Unit	Meter		
Tool	Meter stick or Metric ruler		
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1cm (because it is 1mm)		

Let's Practice!

- Using the metric ruler

- "Ruling" Distance Measurement

The Metric System

Let's talk MASS!

	DISTANCE (width, height, length)	VOLUME	MASS
Definition	How far from one end to the other		
Base Unit	Meter		
Tool	Meter stick or Metric ruler		
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other		The amount of matter (“stuff”) in an object
Base Unit	Meter		
Tool	Meter stick or Metric ruler		
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other		The amount of matter ("stuff") in an object
Base Unit	Meter(m)		Grams (g)
Tool	Meter stick or Metric ruler		
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		

	DISTANCE (width, height, length)	VOLUME	MASS
Definition	How far from one end to the other		The amount of matter (“stuff”) in an object
Base Unit	Meter(m)		Grams (g)
Tool	Meter stick or Metric ruler		balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		

	DISTANCE (width, height, length)	VOLUME	MASS
Definition	How far from one end to the other		The amount of matter ("stuff") in an object
Base Unit	Meter(m)		Grams (g)
Tool	Meter stick or Metric ruler		balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		~Start with the largest #s! (Do 100's, then 10's, then 1's – *make sure the 100's & 10's "click" into place*!) ~Once it is balanced, add all readings together!

Let's Practice!

- Using the balance

- Massive Problems

Rate Your Learning on Today's Lesson!

4 = In addition to score 3, you can help teach your peers

3 = you can accurately read a metric ruler, measure objects with a metric ruler, read a balance, and measure objects with a balance.

2 = you can accurately do two of the requirements

1 = you can accurately do one of the requirements

0 = you are struggling with all things metric and need more teacher help

Rate Your Learning on the Learning Goal!

4 = In addition to score 3, you can help teach your peers

3 = you can accurately measure distance, mass, and volume using the metric system.

2 = you can accurately do two of the requirements

1 = you can accurately do one of the requirements

0 = you are struggling with all things metric and need more teacher help

The Metric System

Let's talk VOLUME!

	DISTANCE (width, height, length)	VOLUME	MASS
Definition	How far from one end to the other		The amount of matter ("stuff") in an object
Base Unit	Meter(m)		Grams (g)
Tool	Meter stick or Metric ruler		balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

	DISTANCE (width, height, length)	VOLUME	MASS
Definition	How far from one end to the other	The amount of space an object takes	The amount of matter ("stuff") in an object
Base Unit	Meter(m)		Grams (g)
Tool	Meter stick or Metric ruler		balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

	DISTANCE (width, height, length)	VOLUME	MASS
Definition	How far from one end to the other	The amount of space an object takes	The amount of matter ("stuff") in an object
Base Unit	Meter(m)	Liter (L) – usually liquid	Grams (g)
Tool	Meter stick or Metric ruler		balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other	The amount of space an object takes	The amount of matter ("stuff") in an object
Base Unit	Meter(m)	Liter (L) – usually liquid Also, cubic centimeters (cm^3)	Grams (g)
Tool	Meter stick or Metric ruler		balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other	The amount of space an object takes	The amount of matter ("stuff") in an object
Base Unit	Meter(m)	Liter (L) – usually liquid Cubic centimeters (cm^3)	Grams (g)
Tool	Meter stick or Metric ruler	Liquid = graduated cylinder, flask, beaker	balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

	DISTANCE (width, height, length)	VOLUME	MASS
Definition	How far from one end to the other	The amount of space an object takes	The amount of matter ("stuff") in an object
Base Unit	Meter(m)	Liter (L) – usually liquid Cubic centimeters (cm^3)	Grams (g)
Tool	Meter stick or Metric ruler	Liquid = graduated cylinder, flask, beaker Solid = meter stick, ruler (usually)	balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1		~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other	The amount of space an object takes	The amount of matter ("stuff") in an object
Base Unit	Meter(m)	Liter (L) – usually liquid Cubic centimeters (cm^3)	Grams (g)
Tool	Meter stick or Metric ruler	Liquid = graduated cylinder, flask, beaker Solid = meter stick, ruler (usually)	balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1	1. Liquid = fill the tool & read	~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other	The amount of space an object takes	The amount of matter ("stuff") in an object
Base Unit	Meter(m)	Liter (L) – usually liquid Cubic centimeters (cm^3)	Grams (g)
Tool	Meter stick or Metric ruler	Liquid = graduated cylinder, flask, beaker Solid = meter stick, ruler (usually)	balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1	1. Liquid = fill the tool & read 2. L X W X H	~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

	DISTANCE (width, height, length)	**VOLUME**	**MASS**
Definition	How far from one end to the other	The amount of space an object takes	The amount of matter ("stuff") in an object
Base Unit	Meter(m)	Liter (L) – usually liquid Cubic centimeters (cm^3)	Grams (g)
Tool	Meter stick or Metric ruler	Liquid = graduated cylinder, flask, beaker Solid = meter stick, ruler (usually)	balance
Method	Line up the object with the zero mark on the tool & read your answer. **Each line = .1	1. Liquid = fill the tool & read 2. L X W X H (cube/rectangular solid) 3. Irregular Shape Solid (that sinks in water): "Water Displacement": a. Add H_20 to cylinder b. Record H_20 amount c. Add object d. Record difference	~Start with the largest #s! (Do 100's, then 10's, then 1's) ~Once it is balanced, add all readings together!

Let's Practice!

- Using a Graduated Cylinder

- Measuring Liquid volume with a graduated cylinder

Rate Your Learning on Today's Lesson!

4 = In addition to score 3, you can help teach your peers

3 = you can accurately read a graduated cylinder, measure liquid volume using a graduated cylinder, and decide which size graduated cylinder should be used.

2 = you can accurately do two of the requirements

1 = you can accurately do one of the requirements

0 = you are struggling with all things metric and need more teacher help

Rate Your Learning on the Learning Goal!

4 = In addition to score 3, you can help teach your peers

3 = you can accurately measure distance, mass, and volume using the metric system.

2 = you can accurately do two of the requirements

1 = you can accurately do one of the requirements

0 = you are struggling with all things metric and need more teacher help