Geometry & Measurement
Introduction to the Metric System

This resource was created to provide an introduction to the Metric system. It presents the advantages of the Metric System (SI), presents the base units of SI, and discusses the prefixes and how they relate to the placement of the decimal point. There are questions to go through with your students (or assign) to assess understanding.

Advantages of the Metric System:

- The Metric system is based on a decimal system (powers of ten). Therefore, calculations can be simplified by using a set of standard prefixes that are associated with a decimal position.
- The Metric System is used by most of the other nations of the world and by the scientific community (the US still uses the English System).

Base Units of the Metric System

- Meter (m): used as the base measurement for lengths and distances.
- Litre (L): used as the base unit for measuring volumes of liquids.
- Gram (g): used as the base unit when you are measuring weights.
- Degree Celsius (°C): base unit used when measuring temperatures.

Prefixes

- Added to the beginning of the base units listed above to indicate if the measurement is larger or smaller than the original base unit.
- The prefix indicates where the decimal point is located in the number.
- Order of prefixes:
    - **Pico** (p): indicates the item being measured is exceedingly small – special devices must be used to measure these units (virus, proteins, and molecules).
    - **Nano** (n): indicates the item being measured is one billion times smaller than the original base unit
    - **Micro** (*u*): indicates the item being measured is one million times smaller than the original base unit
    - **Milli** (m): indicates the item being measured is one -thousandth the size of the original base unit (0.001g = 1mg)
    - **Centi** (c): indicates the item being measured is one -hundredth the size of the original base unit (1 m = 100 cm)
    - **Deci** (d): indicates the item being measured is one tenth the size of the original base unit (i.e., .10 m = 1 dm)
    - **No prefix = the base unit (i.e. 1.0 m)**
    - **Deka** (D): indicates there is 10 times the amount of the original base measurement (i.e. 10.0 L = 1 Dl)
    - **Hecto** (h) = indicates there is 100 times the amount of the original base measurement (i.e. 200.0 m = 2 hm)

- **Kilo** (k) = indicates there is 1000 times the amount of the original base measurement (i.e. 1000 m = 1 km)
- **Mega** (M) = indicates there is 1,000,000 times the amount of the original base measurement (i.e. 7,900,000 L = 7.9ML)
- **Giga** (g) = indicates there is 1,000,000,000 times the amount of the original base measurement (i.e. 3 billion grams = 3 gg)

Examining the Metric System Units

Complete the following:

The width of you index finger is approximately ___ cm in width. If 100 people put their index fingers side by side, the measurement would be approximately _____ m. Multiply that number by 1000 and you would have _____.

If you have a cubic centimeter and you fill it with water, you would have 1 mL. If you had 10 cm^3 filled with water, you would have how many litres?

If you have 1 L of water and it weights 1000 kilograms, how much would 1 mL weight?

Using the space below, make up some riddles and word problem that a classmate has to solve.

> **For example**: I am a tiny unit. 10 of me fit in a decimeter and one hundred of me would be use to measure the length of a metre. What am I?