Advantages of teaching the metric system pages = 8

"A Metric America: A Decision Whose Time Has Come",

Graduations on a customary ruler:

"Some teachers pointed out, for example, that it is very difficult for small children to learn to interpret the graduations on a customary ruler; centimeters and millimeters are conceptually much simpler than small fractions of an inch."

Children Learn Metric more readily:

"Citing a study it had sponsored, the American Association for the Advancement of Science (AAAS) mentioned an additional intangible benefit. It has been found that slower children learn metric more readily than they do the customary system—a factor that could not possibly be expressed in monetary terms."

Time Could be Saved:

"Much more important, though, is the time that could be saved if students did not have to be drilled in the fractions necessary to cope with the customary system. Estimates varied, but mathematics teachers said that in elementary school they spend from 15 to 25 percent of their class time driving home the details of adding, subtracting, multiplying, and dividing common fractions. "

They believe much of this is unnecessary. If the metric system, with its simpler decimal relationships, were taught, they could rapidly give their pupils the basic principles of fractions and then move on to other useful aspects of mathematics.
Time can be saved simply by having to teach just one system of measurement. Example: Teachers in Japan use one system of measurement – The Metric System - while the United States teaches two systems of measurement – Metric and customary. "

Key Teaching Point:

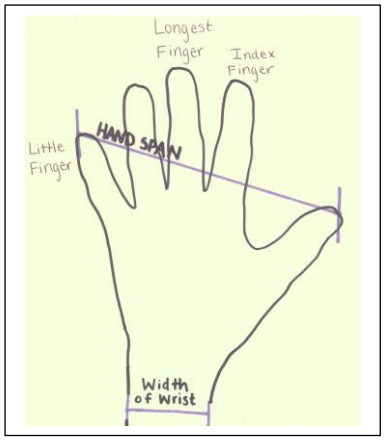
One Key Point to teaching metric to small children.

"*Never convert between the customary system and the metric system"*.

When teaching metric pretend you only know metric. Do not show examples like a meter is about a yard. Show instead that a meter is about the length of a baseball bat or the distance from the floor to the center of a door knob.

Use the "**8-9 Rule"**: Teach both systems {customary & metric} separately for eight month of the nine school month year. Convert between the two systems in month nine.

Elementary Activity for your school



Lend a Hand @ your School

Spread your fingers as far apart as you can and trace your hand on a sheet of plain paper. Measure the following in millimeters with your metric ruler then convert to centimeters. –

# 1. Hand Span	Answer: _____mm	_____ cm
# 2. Length of longest finger	Answer: _____mm	_____ cm
# 3. Length of little finger	Answer: _____mm	_____ cm
# 4. Width of index finger	Answer: _____mm	_____ cm
# 5 Width of Wrist.	Answer: _____mm	_____ cm

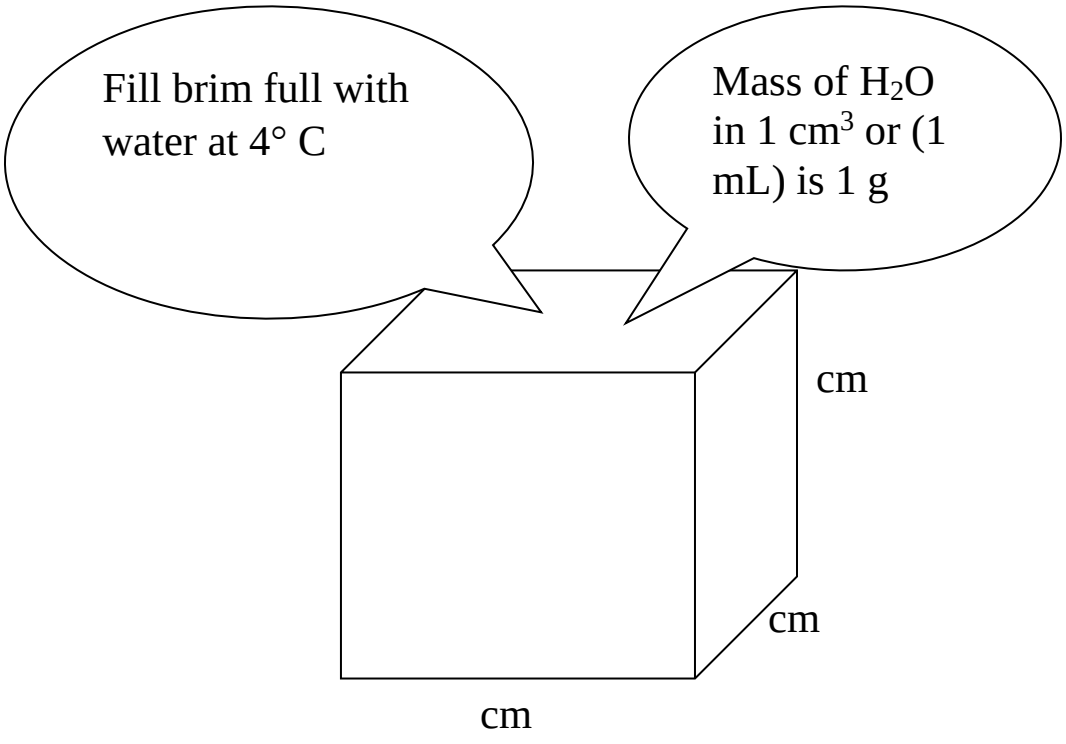
Mass in the Metric System

Isaac Newton pointed out that in everyday life the word weight is used for what is really mass. **Mass is a quantity of matter** as opposed to **weight, which is a force exerted by gravitational pull.**

The fundamental unit of mass is the gram. Denote by g.

Three raisins (dried grape), an ordinary paper clip, several drops of water, a regular size m&m candy, or the contents of a small package of artificial sweetener each has a mass of about 1 g.

Definition: The mass of H_20 (at maximum density) in one cm^3 is one gram



$$1\ cm^3 = 1\ mL$$

1 Liter (L) = 1 dm^3 = 1 000 cm^3 = 1 000 mL and since each mL of water has a mass of 1 g then a liter of water has a mass of 1000 g or 1 kg.

If you visit the grocery store and pick up a liter coke then it will have a mass of 1 kg

Also

$$1\ m^3 = 1\ 000\ dm^3 = 1\ 000\ L$$

Since each liter of water has a mass of 1 kg then a m^3 filled brim full of water will have a mass of 1 000 kg

A one m^3 is about the size of a box that a washing machine could set in.

A newborn baby has a mass of about 3 to 3.5 kg

The Metric Ton (t)

Another unit of mass is the **metric ton (t)**, which is equal to **1 000 kg**.

The metric ton is used to record the mass of an object such as a vehicle. A small car has a mass of about 1 t.

We have the following:

one mL of water has a mass of 1 g

one liter (L) of water has a mass of 1 kg

one cubic meter (m^3) of water has a mass of 1 t

Is this not fantastic! ⇑

Now do this …
If you visit the grocery store then go to where the milk is located and pick up a quart or gallon of milk. What is the mass? Good Luck! You will need a dictionary.
On the other hand, a Liter Coke would have a mass of one kilogram.

Conversions that involve metric units of mass are handled in the same way as conversions that involve metric units of length.

Unit	Symbol	Relationship to gram
ton (metric)	t	1 000 000 g
kilogram	kg	1 000 g
hectogram	hg	100 g
dedagram	dag	10 g
gram	g	1 g
decigram	dg	0.1 g
centigram	cg	0.01 g
milligram	mg	0.001 g

Do you understand metric? Try these.

Find the following relationships:

1. 1 cm^3 of water has a mass of _____
2. 1 dm^3 of water has a mass of _____
3. 1 L of water has a volume of _____
4. 1 cm^3 of water has a capacity of _____
5. 1 mL of water has a mass of _____
6. 1 m^3 of water has a capacity of _____
7. 1 m^3 of water has a mass of _____
8. a 500 mL bottle of water has a mass of _____
9. a 2-liter coke has a mass of _____ g and _____ kg
10. Larger areas in the metric systems has as base unit the are (a) {Pronounced "air"}
one are (a) in the metric system is equal

to _____ m by _____ m area

Answers:

(1) 1 g (2) 1 kg
(3) 1000 cm^3 or 1 000 ml or 1dm^3 (4) 1 mL
(5) 1 g (6) 1000 L or 1 kL
(7) 1 t (8) 500 g (9) 2000 g and 2 kg
(10) 10 m by 10 m area about the size of your classroom

Dual-scaled Medicine Cup Turns Deadly

The Institute for Safe Medication Practices (ISMP) announced in a recent National Alert Network (NAN) report (www.ismp.org/NAN/files/NAN-20150630.pdf) that the use of a dual milliliter-dram measuring cup contributed to a fatal medication dosing error. In the bulletin, ISMP disclosed that because of confusion between the two measurement scales on the cup, a nurse administered to a patient 1 fluid dram (equivalent to 3.7 mL) of morphine sulfate 20 mg/mL oral solution, instead of the prescribed dose of 1 mL. That is, instead of receiving the correct, therapeutic 20 mg dose of morphine (a narcotic pain reliever), the patient received about 74 mg, which turned out to be lethal due to a lack of this patient's sufficient previous exposure to opioids.

Medegen, a large manufacturer of liquid medicine measuring cups, has notified ISMP that it is discontinuing the manufacture of cups with a dram scale. ISMP stated that the distribution of cups bearing dram markings is widespread. However, The US Pharmacopeia had removed apothecary units from official use in 1995. ISMP and other national organizations and professional associations had been urging the elimination of all measurement systems but metric in all processes involving oral liquid medications, ISMP issuing its most recent recommendation in 2011.

THIS IS A METRIC WORLD

METRIC FACTS:

The metric system is the international system of measurement - 94 percent of the people on earth use it all the time.

The rest of us buy cola in liters, video tape in millimeters, light bulbs in watts, and aspirin in milligrams. We use metric tools on our cars, trucks, and power equipment.

Our largest trading partners and closest neighbors, Canada and Mexico, are metric countries.

Most major U. S. industries - including the automobile, construction equipment, machine tool, electronics, soft drink, liquor, pharmaceutical, and health care industries - are primarily or completely metricated.

The metric system is based on decimal arithmetic, just like dollars and cents. Once learned, it’s simpler to use and less prone to error.

In 1988, Congress made the metric system the preferred system of measurement in the United States.

Since 1994, billions of dollars of federal, state, and local metric construction projects of all kinds have been built using the metric system with no cost or schedule problems.

Adopting the metric system is a good deal for Education. Metrication increases both efficiency and quality and will help ensure that American students stay technologically competitive with their foreign counterparts.

We only need to make the change once. The benefits are perpetual.

Going Metric Is Easy and Is Seeping Into the U. S. Language / Metric Is Here To Stay!
By Don M. Jordan, University of South Carolina

"In truth, metrics has seeped into the U. S. vernacular beyond the plastic soda bottle" (says Edward M. Eveld, Knight Ridder Newspapers). It is perfectly acceptable to speak of the 100 meter racer in the Olympics or the local 5K run for cancer research. People are happy to buy a 2-Liter coke and talk about the 4.0 liter engine in their car. Fat and fiber come in grams, sodium in milligrams, and computer speeds in megahertz. Wine and spirits come in metric sizes only. Watts, volts, and amperes are metric units. The metric system is the language of science and medicine. If you want to go to college, you better take chemistry in high school. Chemistry is 100% metric.

Soon you may see product labeling only in metric (For now it must be dual).

Like Olivia Newton-John "Let's Get Physical".

One can make a relationship between everyday metric units and something physical. Examples: Centimeter: the diameter of the colored part {Iris) of your eye. Meter: the height of a door knob in your home; the length of a baseball bat. Gram: a little more than the weight of a paper clip, three raisins one regular size m&m. Decimeter: the length of an ordinary wall receptacle. Square Decimeter: the size of a slice of bread. Note: No relationship is made to the customary units. Do not mix the units. Never say a meter is about a yard.

The Four Main Reasons Why the U. S. Should GO METRIC

1. ***The SI Metric System Was Scientifically Developed***
Example: All units stem from seven basic units. (1) Meter - length, (2) Kilogram - mass, (3) Second - time, (4) Ampere - electric current, (5) Kelvin or Celsius - temperature, (6) Mole - amount of substance, (7) Candela - luminous intensity.

2. ***Ease of Computation***
Try converting 29 mi to rods to yards to feet to inches. Compare with converting 29 km to hectometers to meters to decimeters to centimeters.
The metric system is based on decimal arithmetic, just like dollars and cents. Once learned, it's simpler to use and *less prone to error*. Adopting the metric system is a good idea for Education. Metrication increases both efficiency and quality and will help ensure that American students stay technologically competitive with their foreign counterparts.

3. ***Economic & Trade Reasons***
Most major U. S. industries (including the automobile, construction equipment, machine tool, electronics, soft drink, liquor, pharmaceutical and health care industries) are primarily or completely metricated.
Since 1994, billions of dollars of federal, state, and local construction projects of all kinds have been built using the metric system. We only need to make the change once. The benefits are perpetual.

4. ***This is a METRIC WORLD (Universal Language)***
If the U. S. completely adopts the Metric System it will be the first time since the dawn of civilization that the world will have one language of measurement. Imagine if we could do this with English or Spanish. The metric system is the international system of measurement - 94 percent of the people on earth use it all the time.
Note: In 1988, Congress made the metric system the preferred system of measurement in the United States.

Dr. Don Jordan, University of South Carolina, Eastern Director of the United States Metric Association.
At this site http:www.artsandsciences.sc.edu/cse under program -- metric activities can be found! Likewise at , www.nist.gov/kids and www.metric.org