Get Familiar with Science Tools

Formulas, measurement tools, units of measurement—these sound like math tools! They are, but they are also science tools because math is used constantly in science. If you're going to be successful with investigating science questions, you'll need to have these firmly planted in your mind.

Know Your Measures

Length

Metric System

1 centimeter (cm)	=	10 millimeters (mm)
1 decimeter (dm)	=	10 centimeters (cm)
1 meter (m)	=	10 decimeters (dm)
1 meter (m)	=	100 centimeters (cm)
1 meter (m)	=	1000 millimeters (mm)
1 decameter (dkm)	=	10 meters (m)
1 hectometer (hm)	=	100 meters (m)
1 kilometer (km)	=	100 decameters (dkm)
1 kilometer (km)	=	1000 meters (m)

English System (U.S. Customary)

1 foot (ft)	=	12 inches (in)
1 yard (yd)	=	36 inches (in)
1 yard (yd)	=	3 feet (ft)
1 mile (mi)	=	5280 feet (ft)
1 mile (mi)	=	1760 yards (yd)

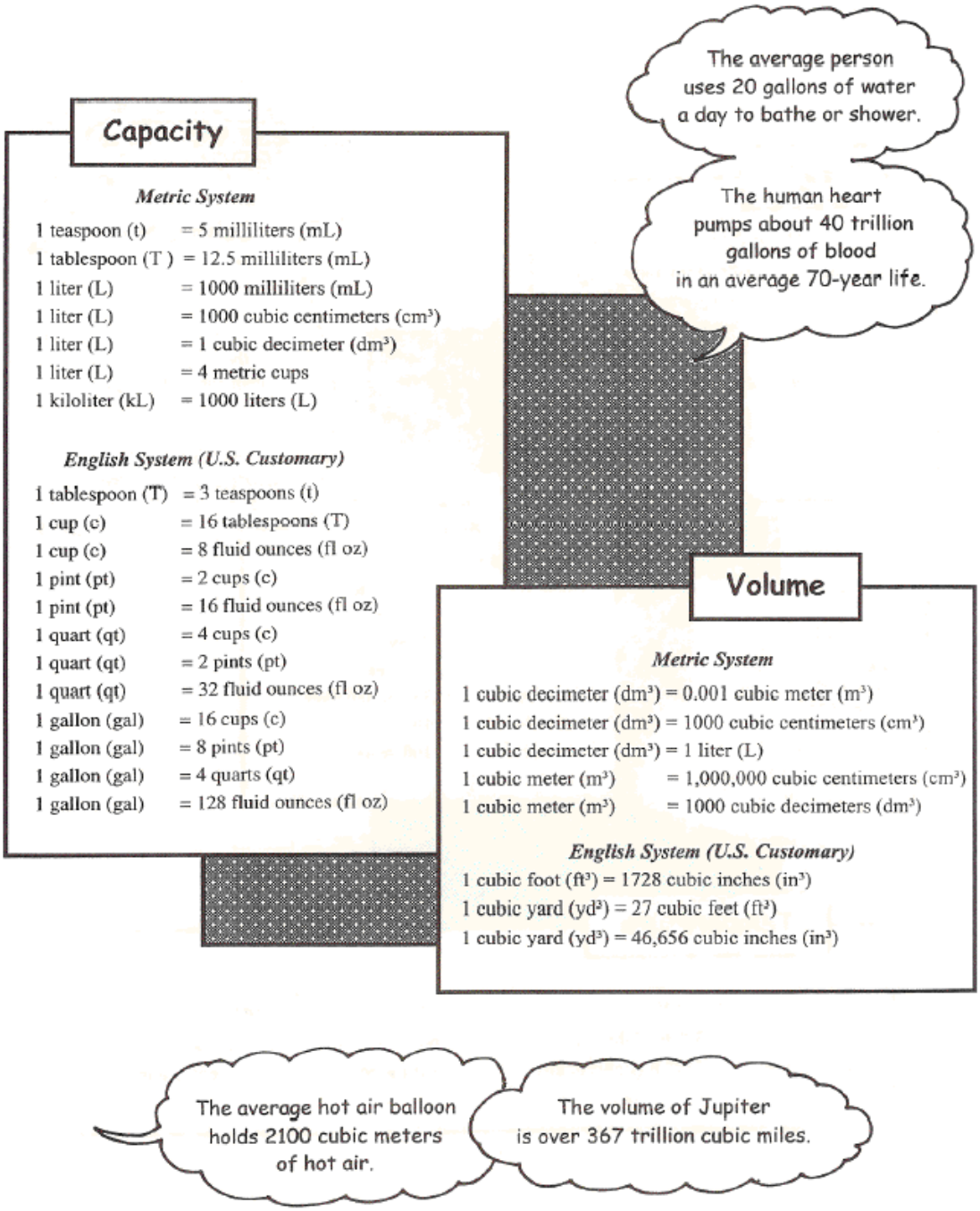
Area

Metric System

1 square meter (m^2)	=	100 square decimeters (dm^2)
1 square meter (m^2)	=	10,000 square centimeters (cm^2)
1 hectare (ha)	=	0.01 square kilometer (km^2)
1 hectare (ha)	=	10,000 square meters (m^2)
1 square kilometer (km^2)	=	1,000,000 square meters (m^2)
1 square kilometer (km^2)	=	100 hectares (ha)

English System (U.S. Customary)

1 square foot (ft^2)	=	144 square inches (in^2)
1 square yard (yd^2)	=	9 square feet (ft^2)
1 square yard (yd^2)	=	1296 square inches (in^2)
1 acre (a)	=	4840 square yards (yd^2)
1 acre (a)	=	43,560 square feet (ft^2)
1 square mile (mi^2)	=	640 acres (a)



Science Fax

The average human head weighs 8.8 pounds.

The smallest bird in the world is the hummingbird. It weighs in at 1.6 grams.

147,000 tons of coconuts are harvested daily in the world.

Weight

Metric System

1 gram (g) = 1000 milligrams (mg)
1 kilogram (kg) = 1000 grams (g)
1 metric ton (t) = 1000 kilograms (kg)

English System (U.S. Customary)

1 pound (lb) = 16 ounces (oz)
1 ton (T) = 2000 pounds (lb)

Time

Both Systems

1 minute (min) = 60 seconds (sec)
1 hour (hr) = 60 minutes (min)
1 day = 24 hours (hr)
1 week = 7 days
1 year (yr) = 52 weeks
1 year (yr) = 365 or 366 days
1 decade = 10 years
1 century = 100 years

The sailfish is one of the fastest moving fish in the world. It can swim about 30 meters per second.

It is about 30 million degrees Fahrenheit in the center of the Sun.

Temperature

The Fahrenheit Scale

freezing point = 32° F (Fahrenheit)
boiling point = 212° F (Fahrenheit)

The Celsius (or Centigrade Scale)

freezing point = 0° C (centigrade)
boiling point = 100° C (centigrade)

Know Your Measurement Equivalents

The sound of a growling bear travels to your ears at about 1100 feet per second.

That's 335 meters per second!

From English to Metric

English Customary Unit	*Approximate Metric Equivalent*
inch	2.45 centimeters
foot	30.48 centimeters
yard	0.9144 meters
mile	1.609 kilometers
acre	4047 square meters
ounce	28.3495 grams
pound	453.59 grams
ton	907.18 kilograms
pint	0.4732 liters
quart	0.9465 liters
gallon	3.785 liters
bushel	35.2390 liters

From Metric to English

Metric Unit	*Approximate English Equivalent*
millimeter	0.04 inch
centimeter	0.39 inch
meter	39.37 inches
kilometer	3,281 feet or .62 miles
gram	0.0353 ounce
hectogram *(100 grams)*	3.53 ounces
kilogram	2.2 pounds
metric ton	22,046.6 pounds or 1.1 tons
liter	1.06 quarts

The tiny desert rat can leap 15 feet. (That's 4.5 meters!)

Temperature Conversions

To change Fahrenheit to Celsius: subtract 32, then multiply by 5/9

To change Celsius to Fahrenheit: multiply by 9/5, then add 32

Know Your Formulas

Get Set Tip # 1

Memorize these letters and symbols, so you will always know what they mean in formulas!

- h = height
- w = width
- b = base
- B = area of base
- s = side
- π = pi (3.14)
- r = radius
- d = diameter

Perimeter

$P = s + s + s$	Perimeter of a triangle
$P = 2(h + w)$	Perimeter of a rectangle
$P =$ sum of sides	Perimeter of irregular polygons
$C = 2\pi r$	Perimeter or circumference of a circle
$C = \pi d$	Perimeter or circumference of a circle

Area

$A = \pi r^2$	Area of a circle
$A = s^2$	Area of a square
$A = bh$	Area of a parallelogram
$A = \frac{1}{2}\ bh$	Area of a triangle
$A = \frac{1}{2}\ (b_1 + b_2)\ h$	Area of a trapezoid

Volume or Capacity

$V = Bh$	Volume of a rectangular or triangular prism
$V = 1/3\ Bh$	Volume of a pyramid
$V = s^3$	Volume of a cube
$V = r^2h$	Volume of a cylinder
$V = 1/3\pi r^2h$	Volume of a cone
$V = 4/3\pi r^3$	Volume of a sphere

A tennis court is 36 feet wide and 78 feet long.

A tortoise crawling around the perimeter would have to travel 228 feet.

His speed is $\frac{1}{4}$ mph. If he travels without stopping, he could get around the court in about 10 minutes!

More Formulas

Force =
mass times acceleration
$F = m \times a$

Work =
force times distance
$W = F \times d$

Power =
work divided by time
$P = \frac{W}{t}$

Mechanical Advantage =
resistance force divided by effort force
$MA = \frac{F_r}{F_e}$

Speed *(velocity)* =
distance divided by time
$V = \frac{d}{t}$

Acceleration =
initial velocity subtracted from final velocity divided by the time over which the velocity changed
$a = \frac{V_f - V_i}{t}$

Electrical Energy =
the power delivered times the length of time it is used
$E = P \times t$

Electrical Current =
voltage divided by resistance
$I = \frac{V}{R}$

Electrical Power =
voltage times current
$P = V \times I$

GOOD QUESTION!