



## ENGINEER TECHNOLOGY GROUP

Webelos



**Requirement #10--While you are a Webelos Scout, earn the Cub Scout Academics belt loop for Mathematics.**

Mathematics is the language engineers use to convey their ideas. They use math to improve efficiency, reduce or determine product or manufacturing costs, build safe products, predict behavior, determine which parts to use, and in many other ways.

The Mathematics Belt Loop Requirements are:

1. **Do five activities within your home or school that require the use**
2. **of mathematics. Explain to your den how you used everyday math.**



**Flow Rate** – Place an empty gallon jug under a faucet, turn it on, and fill with water. Time how long it takes (in seconds). Divide the time by into 60 to get the flow rate in gallons per minute.

**Resting vs. Exercising Heart Rate** – Record your resting pulse for 20 seconds. Do some vigorous exercise (running, jumping, etc.) for a few minutes. Stop and record the exercise pulse rate. Multiply both by 3 to get the number of beats in 1 minute and compare.

**Candy Bar Split** – Cut a good-sized candy bar into at least 20 pieces. Distribute as evenly as possible to the group.

**Tile Counting** – Estimate the number of tiles (floor or ceiling) in a room by multiplying the # of rows and columns together. Compare to another room.

**Marshmallow Counting** – Estimate the number of mini-marshmallows in a bag by weighing the whole bag, weighing 30, and then using the formula:

$$\# \text{ marshmallows per bag} = 30 * (\text{weight of bag}) / (\text{weight of 30})$$

2. **Keep track of the money you earn and spend for three weeks.**



You can help the boy get a head start by asking what he earned and spent for the last week – or as far back as he can remember. You can give the boys unused check registers to track their money, if you have some.

3. **Measure five items using both metric and non-metric measures. Find out about the history of the metric system of measurement.**

Conduct a “Measurement Olympics”. Have the boys write down their guesses in metric and non-metric measures in various categories. Then award medals to the winners.

**Volume** – Guess the volume of water in a glass (milliliters and ounces).

**Weight** – Guess the weight of an object (kilograms and pounds).

**Temperature** – Guess the temperature of water in a glass (Celsius and Fahrenheit).

**Length** – Guess the length of a straight line on a piece of paper (centimeters and inches).





## ENGINEER MIDWAY TECHNOLOGY GROUP



### Morse code Telegraph

**Parts needed:** 2 buzzers

2 push button switches

1 9 V battery clamp

1 9 v battery

15' 4 conductor 22 gauge wire

1 6" x 4"x 3/4" wood block

1 8" x 4" 3/4" wood block

2 copies of Morse code to glue on each block of wood

Saw cuts in the back of the wood 3/8" deep to lay the wire in. In the back of the 6" wood drill one small hole along the cut all the way to the front for buzzer wire. Straight across drill a hole for the switch to push up into. Using the 8" piece of wood do the same thing as the other block of wood adding one more small hole for the 9 v battery clamp. (Can also be used with communicator)

