RAFT IDEAS

Topics: Measurement, Estimation, Metric System

Materials List
- ✓ Foam "packing peanuts"
- ✓ Masking tape to mark off the floor in metric units
- ✓ Meter stick (1 per group is ideal)
- ✓ Record or data sheet

This activity can be used to teach:
- Addition and Subtraction (Common Core Math Standards: Grade 2, Number and Operations in Base Ten, 5 & 7)
- Measurement of length & units of length (Common Core Math Standards: Measurement and Data, Grade 2, 1-5, & 9; Grade 4, 1)
- Problems involving length (Common Core Math Standards: Grade 4, Measurement and Data, 2)
- Science & Engineering Practices (Next Generation Science Standards: Grades 2-6)

Packing Peanut Punt
Metric Distance Challenge

Students estimate and measure how far they can punt a packing peanut!

Assembly
1. Each group should use masking tape to mark off an area of floor 2 meters long and 1 meter wide. Label the distances in meters and decimeters. Make sure there is plenty of room between groups.

To Do and Notice
1. Demonstrate the punting technique: drop a packing peanut and kick the falling peanut before the peanut hits the ground. (A table version could use flicking.)
2. Before punting, students estimate the distance the peanut will travel. (In step 5 the recorded estimate will be compared with the actual distance traveled.)
3. After each punt measure, and record, the distance traveled. Repeat 3 times.
4. Each student adds all 3 distances together to calculate a **total distance score**.
5. Calculate the difference between each estimate and the distances traveled. The **estimation score** is the sum of the 3 differences.
6. There are 2 ways to win: by having the highest total distance score or by having the lowest estimation score.

The Content Behind the Activity
The Metric System was established in France in 1791 in an effort to create a reproducible, decimal-based measurement system. During the 1960's, most countries, except the United States, Burma, and Liberia, adopted the International System of Units ("**S**ystème **I**nternational d'Unités" in French, or **SI**) as their official measurement system. Around the world traditional local measurements are still being used for announcing a baby's weight at birth, for example. The world's scientific community, including the United States, exclusively uses the Metric System.

The meter is the basic Metric unit of distance. Originally the meter was defined as $1/10,000,000$ (1 tenth million) of the distance from the North Pole to the equator. The meter has since been redefine as equal to the distance that light travels, in a vacuum, in $\frac{1}{299,792,458}$ of a second. A meter is longer than 1 yard by almost 10 percent. Standard prefixes are added to define shorter and longer units: 10 **deci**meters = 100 **centi**meters = 1,000 **milli**meters = **1 meter**. 1,000 meters = 1 **kilo**meter. In the Metric System the same prefixes are used with other base units (liter, gram).

Taking it Further
Explore volume metric measurement with *Foam Squeeze Frenzy* idea sheet.

Web Resources (Visit www.raft.net/raft-idea?isid=549 for more resources!)
- History of the Metric System -http://physics.nist.gov/cuu/Units/history.html
- Metric System in the United States - http://www.metric.org/
- Metric units & Measurement http://www.mathleague.com/help/metric/metric.htm