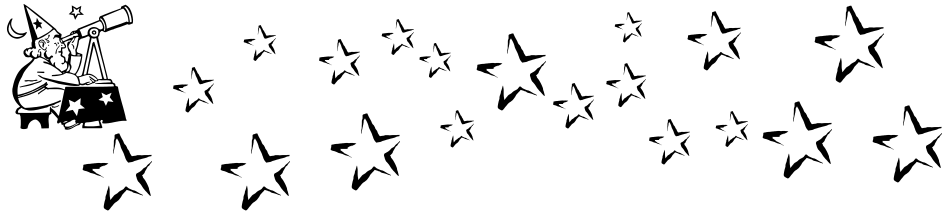
Counting to a Million

Wow, a Million is a Lot!



Topics: Large Numbers, Astronomical Distances, Estimation, Measurement

Materials List

- ✓ At least thousands of tiny objects (e.g.- plastic bits, millet, poppy seeds) – a million if possible
- ✓ Measuring devices such as measuring spoons, cups, and balances

This activity can be used to teach:

- Place Value (Common Core Math Standards: Number and Operations in Base Ten, Grade 4, 1, 2, 3; Grade 5, 1 & 2)
- Exponents (Common Core Math Standards: Grade 8, Expressions and Equations, 3)

Without concrete examples, the difference between 100,000 and 1,000,000 can look like just another zero.

To Do and Notice

1. Optional: Start with an example within the realm of student experience: movie tickets that sell for about $10, a reasonable price. If a "zero" was added, and movie tickets were suddenly $100, people might be shocked, outraged. Students would get the idea of the difference 1 zero makes is… well, 10-fold.
2. Begin with a large container with at least several thousand objects.
3. Estimate the number of objects in the container.
4. Count the objects. If desired, work in teams or groups.
5. At some point, counters might suggest other methods (e.g. – counting the number of objects in a spoonful and then counting spoonfuls, weighing a small sample and then weighing the total sample). The group can decide on a desired, alternate method.
6. After deciding on the number of objects in the sample (by whatever method was agreed on and used), figure out the volume of a million objects. Would a million fit into a water jug? a truck bed? a bus?

The Content Behind the Activity

One Million is written as a 1 followed by 6 zeros, also written 1×10^6 or 10^6. Understanding a million, like anything else, comes from experience. A million is a difficult concept for many students to grasp, because they rarely see that many of anything collected in one place. Counting to a Million helps students visualize large numbers so the concept is easier to internalize, a necessary step for large number sense and required for visualizing astronomical distances and spatial thinking on large scales.

- 1,000,000 seconds = 11.57 days!
- 1,000,000 days = almost 2738 years!
- A million mile trip would go more than 40 times around the Earth (equator)!
- Or take you to the Moon and back twice!

Taking it Further

"Counting to a Million" can provide a springboard for discussions and activities involving even larger numbers, such as astronomical distances (i.e. - light-year, A.U.) or Earth's human population.

Web Resources (Visit www.raft.net/raft-idea?isid=114 for more resources!

- Visit "Powers of Ten" for an amazing spatial journey: www.powersoften.com
- Information on scientific notation: www.nyu.edu/pages/mathmol/textbook/scinot.html
- For current human population, visit: www.census.gov/main/www/popclock.html
- Teacher designed math – https://njctl.org/courses/math

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