Activity description: **Make and use an Abacus**

- make an abacus
- count to 100 with an abacus
- have addition and subtraction races using the abacus

Age level: 6+

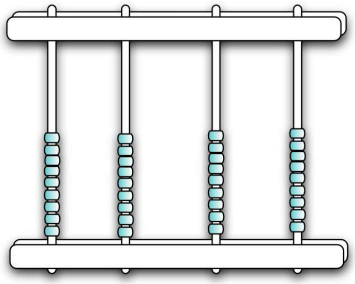
Time frame: medium to long

Equipment needed:

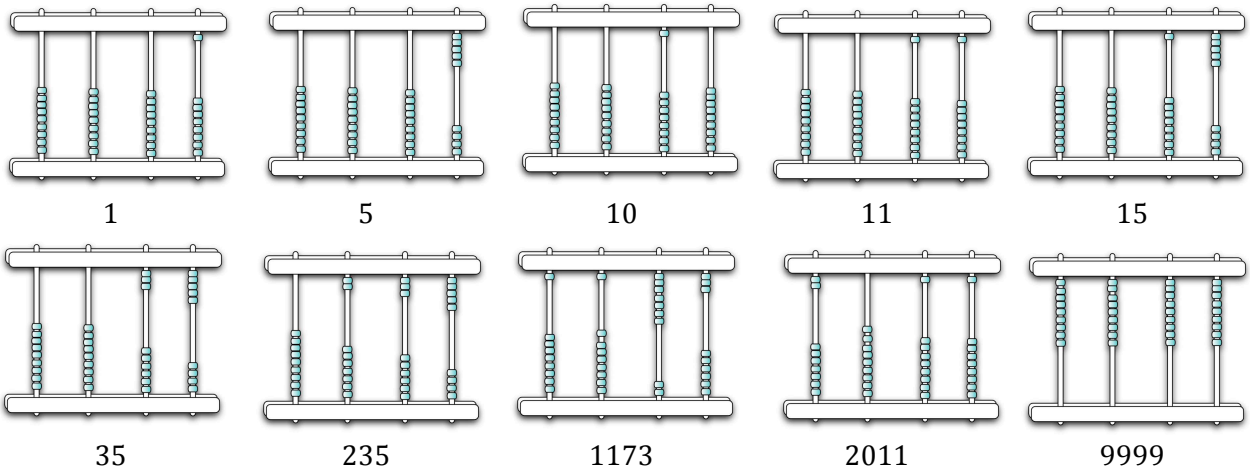
- 36 beads per child
- popsicle sticks (4 per child)
- chenille stems (2 per child, cut each one in half to reduce the length) (skewers for shishkabobs also work, but beware of the pointy ends!)
- tape and/or hot glue

Running the activity:

1. Build the abacus
   - there are lots of different ways to do this (a web search returns lots of hits) but we're going to build a simplified version of an abacus, NOT the traditional Chinese or Japanese type
   - have each child thread 9 beads onto each of 4 short chenille stems
   - fold the top end of each stem over one of the popsicle sticks, then fold the bottom end of each stem over another popsicle stick. Try to keep the two sticks parallel.
   - use another popsicle stick to kind of "sandwich" the top chenille stem ends; secure with tape or hot glue. Glue or tape can also be used to secure the chenille stems if needed. Repeat for the bottom.
   - You are done! Your finished product should look something like this.



2. Use the abacus to count
   - move all the beads to the bottom as shown in the diagram. That's 0.
   - The column on the right represents the 1s, the next column is the 10s, the next is the 100s, and so on. Our abacus can only go up to 9999.
   - To count move one bead in the 1s column to the top. That's the number 1.
   - Now another bead to get 2, and so on up to 9. To get 10 we move all the beads in the 1s column down and move up one bead from the 10s column. See the pictures below.



3. Use the abacus to add
   - let's say you want to add 15 + 32
   - put the number 15 on your abacus, then add two more beads in the 1s column (move them up to the top) and 3 more beads in the 10s columns. Voila!
   - let's say you want to add 9 + 12
   - put the number 9 on your abacus, then add two more beads in the 1s column. Oh oh, there aren't two more beads! So move them all down, and put another bead up in the next column over, taking care of one bead out of the two you need to move, then move one more up in the 1s column. Then deal with the 10s column – move 1 bead up.
   - how would you do subtraction?

History:

- the abacus in various forms has been around since practically forever; one website has a timeline going back to 300 BC and another lists evidence of usage as far back as 2700 BC!
- the general idea is that you have a frame in which beads or counters of some sort can be moved around to keep track of things, but the number of beads and how they are affixed to the frame varies dramatically.
- the Chinese version has 5 beads on the bottom, with a separator, then another two on top, while the Japanese version has 4 beads on the version, a separator, then another 1 on top. Our version, for simplicity, has no separator.
- one use of the abacus today is for teaching math to blind people, who can feel the number of beads in each column and then use the abacus for performing calculations with those numbers.
- there is a lot more information on the web; see, for instance http://www.ee.ryerson.ca/~elf/abacus/history.html and http://en.wikipedia.org/wiki/Abacus