

Introduction to the Abacus

Charlee Raddish
Green Intermediate School

1. I will be able to teach 5th and 6th grade students how to use an abacus in my math intervention classes. These are students who struggle to succeed in math and need remediation. Most students are in my classroom for 45 minutes daily.

Once my students are able to actually use an abacus, I would like them to share and display their knowledge at the Green Learning Expo. This is a community event that the school hosts yearly that actively displays student learning through demonstrations and activities for people of all ages.

2. In Asian countries success in school is highly valued. This cultural value is instilled in students from the time they begin school. Researchers have found that Asian children are superior to American children academically. One reason researchers give to support Asian superiority in academic performance is the widespread use of the abacus (<http://www.cut-the-knot.org/ctk/reform.shtml>).
3. The purpose of this lesson is to introduce to 5th and 6th grade students what an abacus is and how to use an abacus to add and subtract numbers. Using an abacus develops student's knowledge of counting concepts along with grouping of objects and the place-value system.

State of Ohio Mathematics Content Standards (6th Grade)

Patterns, Functions and Algebra Strand

- 01.) Justify a general rule for a pattern or a function by using physical materials, visual representations, words, tables or graphs.

4. Lesson Plan: Introduction to the Abacus

Day 1

1. Students will go to the computer lab and complete a webquest on the Internet to research what an abacus is and the history behind them.
2. Students will need to log on to the computer and go to Mrs. Raddish's web page. There they will be able to download the webquest handout and copy and paste the links into the web address bar thus eliminating possible errors in typing and saving time.
**Before I take my students to the computer lab, I will show them this step in the classroom on the smartboard.*
3. Students will work in pairs (This assignment can be done individually to increase difficulty).
4. Collect student answers to webquest for a grade.

Day 2

1. Return graded wequest papers to pairs. Have a 5-10 minute discussion on the abacus. What did the students find interesting? Have they ever seen one in person? Do they think using an abacus would be faster than using a calculator for addition, subtraction, multiplication and division? Is the abacus still used today? How much are the top beads worth? How much are the bottom beads worth
2. Show students the following 2-minute You Tube Video demonstrating how students are taught to use the abacus in Japan. By the time they are 12 years old (the age of my students) they have become “human calculators”.

Briefly discuss. What amazed students the most?

3. Have students create their own abacus. The website http://askeric.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Social_Studies/Anthropology/ANT0200.html provides a detailed list of all the materials, amount of time, and procedures for making an abacus.

Day 3 and 4

1. Now that the students have learned background information on the abacus and have created their own abacuses it is time to learn how to use them. To refresh the students’ memories, ask what is the value of the beads in the upper deck? **(5)** What is the value of the beads in the lower deck? **(1)**
2. Show students the following You Tube Video on how to use the abacus for calculations: <http://youtube.com/watch?v=CvsnftXXKdw>

Pause the video as needed so students can visualize what is being taught in the video on their personal abacuses.

3. Have the students practice moving the beads to represent various numbers. For example, call out 139 and have the students move the beads to represent that number. After kids seem to be getting the hang of this have them begin to add numbers that do not require borrowing.
4. At this point I will have students complete worksheets 1,2, and 3 found here: http://askeric.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Social_Studies/Anthropology/ANT0200.html

I will have the students complete one worksheet at a time and I will check it, and then go over each one with the class. I will allow students to collaborate

with other students at their tables to complete. To complete all 3 of these handouts I am guessing it will take me another complete day to finish them. The answers to these worksheets are also found on this site.

5. Evaluation: I will simply evaluate my students by if they complete all three worksheets. I only assign pass/fail grades for my class and I think this will be an engaging learning activity that they will enjoy (If your classroom structure requires a grade, simply collect all 3 worksheets and take for a grade).

5. Resources:

Ament, P. (1997-2007). Abacus. Troy MI:© 1997-2007 In *The Great Idea Finder*, 3/6/2006. Retrieved April 12, 2008, from <http://www.ideafinder.com/history/inventions/abacus.htm>

Bogomolony, A. (1999, May). Math Education: Where To Start. In *Cut the Knot*. Retrieved April 12, 2008, from <http://www.cut-the-knot.org/ctk/reform.shtml>

Fernandez, L. (2004, November 8). Abacus: The Art of Calculating with Beads. In *Ryerson University*. Retrieved April 12, 2008, from <http://www.ee.ryerson.ca/~elf/abacus/>

Webquest

To find the following answers visit this website:

<http://www.ideafinder.com/history/inventions/abacus.htm>

1. Who invented the first abacus? _____
2. When was it invented? _____
3. Does the abacus actually do the computing? Explain.

To find the following answers visit this website:

<http://www.ee.ryerson.ca/~elf/abacus/history.html>

4. In Modern Times, name the 3 countries that have their own unique version of an abacus.

To find the following answers visit this website:

<http://www.ee.ryerson.ca/~elf/abacus/intro.html>

5. When you pick up the abacus to use, should all of the beads be placed so they **touch the beam** or should they be placed **away from the beam**?

6. What is the value of each bead in the upper deck? _____
7. What is the value of each bead in the lower deck? _____

8. The abacus is still used today by shopkeepers in these two locations:

9. Students who are _____ also learn to use an abacus because they can “feel” the numbers instead of using pencil and paper.

10. What is one particular use for the abacus?

Answers to Webquest

1. Chinese
2. c3000 BC or 5000 years ago
3. The abacus does not actually do the computing, as today's calculators do. It helps people keep track of numbers as they do the computing.
4. China, Japan, Russia
5. pushing all the beads on both the upper and lower decks away from the beam
6. 5
7. 1
8. shopkeepers in Asia; “Chinatowns” in N. America
9. Blind
10. One particular use for the abacus is teaching children simple mathematics and especially multiplication