Teaching Students with Visual Impairments – Carmen Willings

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# Cranmer Abacus Instruction

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An abacus can be procured through quota funds from the American Printing House for the Blind if you have access to quota funds. There are several abaci that are available through other vendors including Amazon. Although it is entirely appropriate to expose students at an early age to the abacus, prior to beginning formal instruction in the abacus, it is important to ensure that the student has foundational skills. These include a solid knowledge of addition facts, knowledge of place value, and the ability to define terms used for addition problems.

An abacus is a calculation tool, but it should not be confused with a calculator. A better comparison is that it is used as paper and pencil for students with vision. The Cranmer Abacus was designed specifically for individuals who are blind. What makes it unique is the piece of soft fabric or rubber that is placed behind the beads so that they will not inadvertently move while the person performs calculations.
Once students have a basic understanding of addition and subtraction and have mastered their basic math facts, it is important to teach abacus skills to the student. It can't be stressed enough that a student needs to be able to do mental math with some ease before the abacus can be a useful tool. Talking calculators should also be avoided until a student understands mathematical processes. Students should ONLY be permitted to use a calculator if all students in the class are permitted to use their calculators. There is a common misunderstanding that the abacus is comparable to a calculator. A better comparison is its similarity to using fingers to count or paper and pencil. An abacus is a wonderful tool that can assist students in performing mathematical operations.
The abacus teaches mathematical skills that can't be replaced with talking calculators as it teaches the student the process of the calculation and leads to a better understanding of numbers and number sense. The Cranmer abacus is available through APH quota funds as well as Abacus Basic Competency: A County Method available from APH. For those who do not have access to quota funds, it can be purchased through a variety of retailers.

## Abacus Basics

​The Cranmer Abacus has thirteen vertical rods. On each rod are five moveable beads. A horizontal separation bar divides the top-most bead on each rod from the bottom 4 beads.



**Zero Position**The zero position is when all the single beads are positioned at the top of the frame, and the four lower beads on each rod are on the bottom. There are raised dots along the separation line at each rod, and a raised vertical line after every third dot. The lines, called unit marks, serve as commas and decimal points depending on the math problem.

The first rod or column on the far right is the units rod. Each bead below the separation bar on this rod has the value of **one**. The single bead on that rod has a value of **5**. The abacus is based on the decimal system so as you move to each rod on to the left the pattern continues. The second column is the tens column, the third column is the hundreds column and so on. Therefore, in the tens column, each bead below the separation bar has a value 10 and the single bead above the bar has a value of 50. This pattern continues up to the trillion column.

## Setting & Clearing Numbers

Numbers are "set" when they are recorded and "cleared" when they are removed or erased.

* To set 1, move the top bead on the unit rod toward the separation bar.
* To set a 2, move the second bead on the unit rod toward the separation bar.
* To set a 3, move the third bead on the unit rod toward the separation bar.
* To set a 4, move the fourth bead on the unit rod toward the separation bar.
* To set a 5, clear all four beads by moving them away from the separation bar and moving the single bead with the value of 5 toward the separation bar.
* To set 6, move the topmost bead below the separation rod up toward the separation bar.
* To set 7, move the second bead on the unit rod toward the separation bar.
* To set 8, move the third bead on the unit rod toward the separation bar.
* To set 9, move the fourth bead on the unit rod toward the separation bar.
* To set 10, clear all four beads in the unit rod as well as the single bead and move the topmost bead in the tens column, the second column from the right, toward the separation bar.

Additional Resources...

Teachers of Students with Visual Impairments (TVIs) may need refreshers and practice in using the abacus as they can go years without having a student who requires this type of instruction. Thankfully, there are tools available to refresh skills. There are different methods of teaching the abacus, the following resources provide instruction in some of these methods. Additionally, YouTube videos are available online that instruct on how to perform various calculations.

**Abacus Made Easy Second Edition: A Simplified Manual for Teaching the Cranmer Abacus** This manual, available from APH, provides simplified instructions in setting and clearing numbers and perform operations including addition, subtraction, multiplication, division, decimals, fractions, percent, and square roots on the abacus.

**Abacus Basic Competency: A Counting Method**
This instruction manual, available from APH, teaches abacus skills in the four basic
math operations. This abacus instructional system uses the Counting Method instead of the traditional indirect method.

[**TSBVI**](https://www.tsbvi.edu/videos-webinars/mathematics)Susan Osterhaus, along with other TVI's, have math resources and videos on abacus use and instruction on Texas School for the Blind.