

Computer-Assisted Instruction and Mathematics

What Is Computer-Assisted Instruction?

“Computer-assisted instruction” (CAI) refers to instruction or remediation presented on a computer. Many educational computer programs are available online and from computer stores and textbook companies. They enhance teacher instruction in several ways.

Computer programs are interactive and can illustrate a concept through attractive animation, sound, and demonstration. They allow students to progress at their own pace and work individually or problem solve in a group. Computers provide immediate feedback, letting students know whether their answer is correct. If the answer is not correct, the program shows students how to correctly answer the question. Computers offer a different type of activity and a change of pace from teacher-led or group instruction.

Computer-assisted instruction improves instruction for students with disabilities because students receive immediate feedback and do not continue to practice the wrong skills. Many computer programs can move through instruction at the student’s pace and keep track of the student’s errors and progress. Computers capture the students’ attention because the programs are interactive and engage the students’ spirit of competitiveness to increase their scores. Also, computer-assisted instruction moves at the students’ pace and usually does not move ahead until they have mastered the skill. Programs provide differentiated lessons to challenge students who are at risk, average, or gifted.*

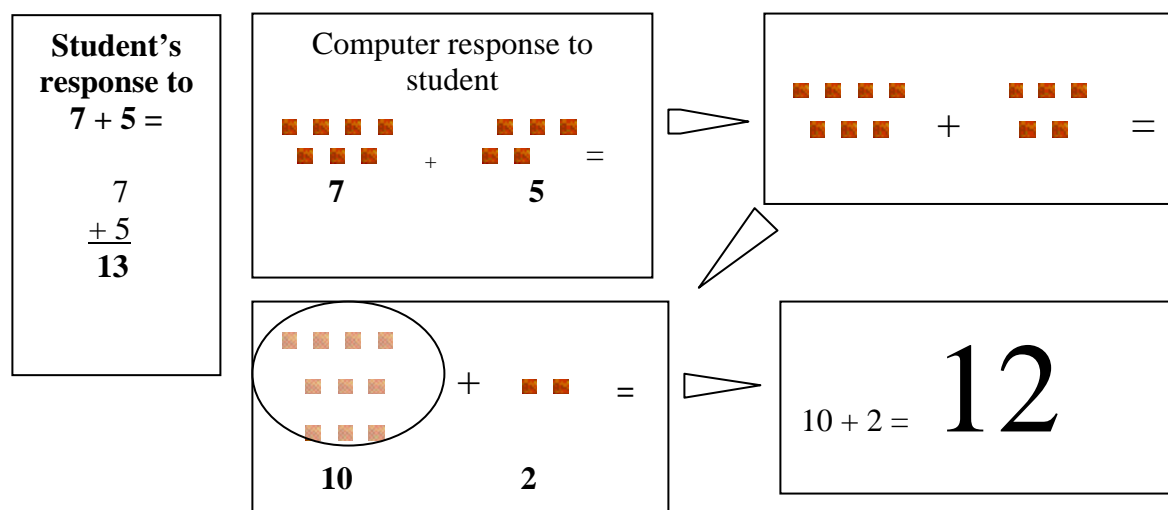
What Does CAI Look Like for Mathematics?

Mathematics computer programs demonstrate concepts, instruct, and remediate student errors and misunderstandings from preschool through college. Some programs are useful for teaching basic skills. The game in the box at the right helps students develop their basic skills in an entertaining way; it relies on the students’ sense of competitiveness to improve their skills by improving their scores. Many entertaining computer mathematics games encourage students to learn while enjoying the experience. Other programs are useful for instruction or remediation because they present problems that the student answers. If the answer is correct, the student is usually rewarded with a “Great Job!” or an animated response on the computer screen. If the answer is

In one computer game for children ages 5 through 12, a little green monster gobbles numbers on a grid-like screen while avoiding evil monsters. The little green monster, controlled by the student, may be asked to gobble prime numbers, multiples of 4, or factors of 32. If the little green monster eats the wrong number, it disappears. This type of game is a fun way for students to teach themselves basic skills, and it could be used as a reward.

* The programs cited in this discussion are based on research; however, it is not the purpose of this report to evaluate the rigor of the research supporting the programs themselves.

wrong, the computer demonstrates the correct way to solve the problem. The example below demonstrates a typical mathematics computer lesson for demonstrating the concept of regrouping in addition.



Finally, programs are available that demonstrate mathematical concepts that are better explained through visual or manipulative resources. Examples of such online programs are the Math Forum @ Drexel at <http://mathforum.org/arithmetic/arith.software.html> and the Virtual Library of Interactive Manipulatives for Interactive Mathematics developed by Utah State University at <http://matti.usu.edu/nlvm/nav/index.html>.

How Is CAI Implemented?

Teachers should review the computer program or the online activity or game to understand the context of the lessons and determine which ones fit the needs of their students and how they may enhance instruction.

- Can this program supplement the lesson, give basic skills practice, or be used as an educational reward for students?
- Is the material presented so that students will remain interested yet not lose valuable instruction time trying to figure out how to operate the program? Does the program waste time with too much animation?
- Is the program at the correct level for the class or the individual student?

Teachers should also review all Web sites and links immediately before directing students to them. Web addresses and links frequently change and become inactive. Students might become frustrated when links are no longer available.

Students may be scheduled for instructional or remedial time with the computer. The computer program may also be a learning station in a classroom learning center or a reward for positive behavior or work completion.

References and Resources

<http://www.aplusemath.com/> — The A+ Math site helps students learn mathematics interactively with a mathematics game room, flashcards, and practice sheets.

<http://www.coolmath4kids.com/> — Coolmath4kids is a colorful Web site (how did they make that dangly cursor?!) that has fun mathematics activities for children and adults age 3 and up.

http://www.edinformatics.com/kids_teens/kt_math.htm — Edinformatics: Information for the Information Age offers many links to online mathematics sites for instruction, practice, and games. Descriptors tell the age level (kids, teens, mature teens) of each site.

<http://www.figurethis.org/index.html> — Figure This! Math Challenges for Families has a teacher's kit complete with a PowerPoint presentation and blackline masters to introduce this series of family problem-solving mathematics challenges to parents. The grade levels of the activities range from grades 1 through 6.

<http://www.kcw.org/reprek6.htm> — This site has resource links for parents and educators of children grades pre-K to 6.

http://www.idonline.org/ld_indepth/technology/babbitt_math_tips.html — This site presents 10 tips for selecting mathematics instruction software for students with learning disabilities.

<http://mathforum.org/arithmetics/arith.software.html> — The Math Forum @ Drexel Web site offers arithmetic software or sites, some for purchase, some for downloading; other lists of links; and descriptions of the programs.

<http://matti.usu.edu/nlvm/nav/index.html> — This virtual library of interactive manipulatives for interactive mathematics for pre-K to grade 12 comes from Utah State University.

<http://www.netn.net/14113.htm> — This site has many interesting science, early education, activity, and organization links for elementary school teachers and for parents of elementary children. Some of the sites are free and some charge a fee for their materials.

This strategy is identified as a Promising Practice.

View the [Access Center Research Continuum](#).



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