



**Carnegie Learning™**  
**Developmental Math Solutions**

**ACCELERATING  
STUDENT  
PREPAREDNESS**

**Carnegie Learning Developmental Math software is like having an interactive textbook companion individualized to meet the needs of each student. Instructors easily organize the software units to complement the school's printed curriculum, and the differentiated software instruction maximizes the remediation time while boosting confidence and helping students to think about applying and making connections in mathematics. Carnegie Learning software actively engages the students which is critical to keeping them successfully on the path to their degrees.**

**Suzanne Etheridge  
Mathematics Instructor  
Pellissippi State Community  
Technical College**

**I have successfully used Carnegie Learning's K-12 solution with adult learners, and I like what I see in the new solution specifically built for the needs of the post-secondary market. This is a fresh and exciting approach to remediating college level math students. It offers instructors the flexibility to select specific units for a custom curriculum. It also provides the student individualized step-by-step instruction for each lesson, the ability to go back and review concepts and practice skills from any point in the software and, in general, personalizes the learning path so that the curricula are efficient for college use.**

**Patrick Wagner  
Mathematics Instructor  
Los Medanos College**

### **Challenges in Developmental Mathematics**

According to the Alliance for Excellent Education, the United States loses more than \$3.7 billion a year because high school students are not learning the basic skills that are needed to enter college or the work force. Each year, 1.4 billion of those dollars is used to provide remediation to recent high school graduates. Almost one-third of all college freshmen take at least one remedial course a year. These remedial students are likely to drop out of post-secondary education without a degree, thus decreasing their earning potential, and depleting the economy of \$2.4 billion a year.

Community colleges must adapt to the needs of the students, from working adults to young undergrads, which may be arriving on campus anxious to move ahead but not yet ready for college math.

### **Carnegie Learning™ Developmental Math Curriculum Solutions**

All students can achieve proficiency in mathematics with Carnegie Learning™ Developmental Math Solutions. Our solution provides students of all ages and skill levels with highly individualized and self-paced instruction that meets their exact needs to improve their developmental math skills. That means your developmental math courses will be able to retain students and quickly promote them into their degree programs.

### **Implementation Models**

Carnegie Learning Developmental Math Solutions provides interactive instruction in these math courses: Cognitive Tutor® Prealgebra and Cognitive Tutor® Algebra. Our curricula can be used in the following ways:

- As a primary source of self-paced and individualized instruction for developmental math courses at the Pre-Algebra, Beginning, Elementary, and Intermediate Algebra levels
- As a software supplement to commonly used textbooks for developmental math courses
- As an individualized, tutoring resource in campus learning centers for students needing targeted remediation

Carnegie Learning offers multiple purchasing options to fit your needs, including:

- Campus licensing models for learning centers
- Faculty adoptions and student purchases from campus bookstores

A subscription to Carnegie Learning Developmental Math Solutions includes the following:

- Student License for the Cognitive Tutor® software
- Access to Carnegie Learning™ Instructor's Toolkit, a simple to use learning management system for enrolling students and monitoring their progress. Additionally, instructors have access to Carnegie Learning™ Resource Center for resources like correlation documents, implementation guides, etc.

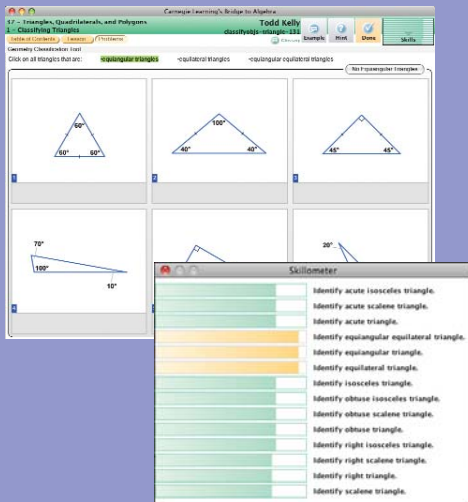
A Carnegie Learning Regional Account Manager can help you select a model that is right for your campus and developmental studies programs.



## How it Works

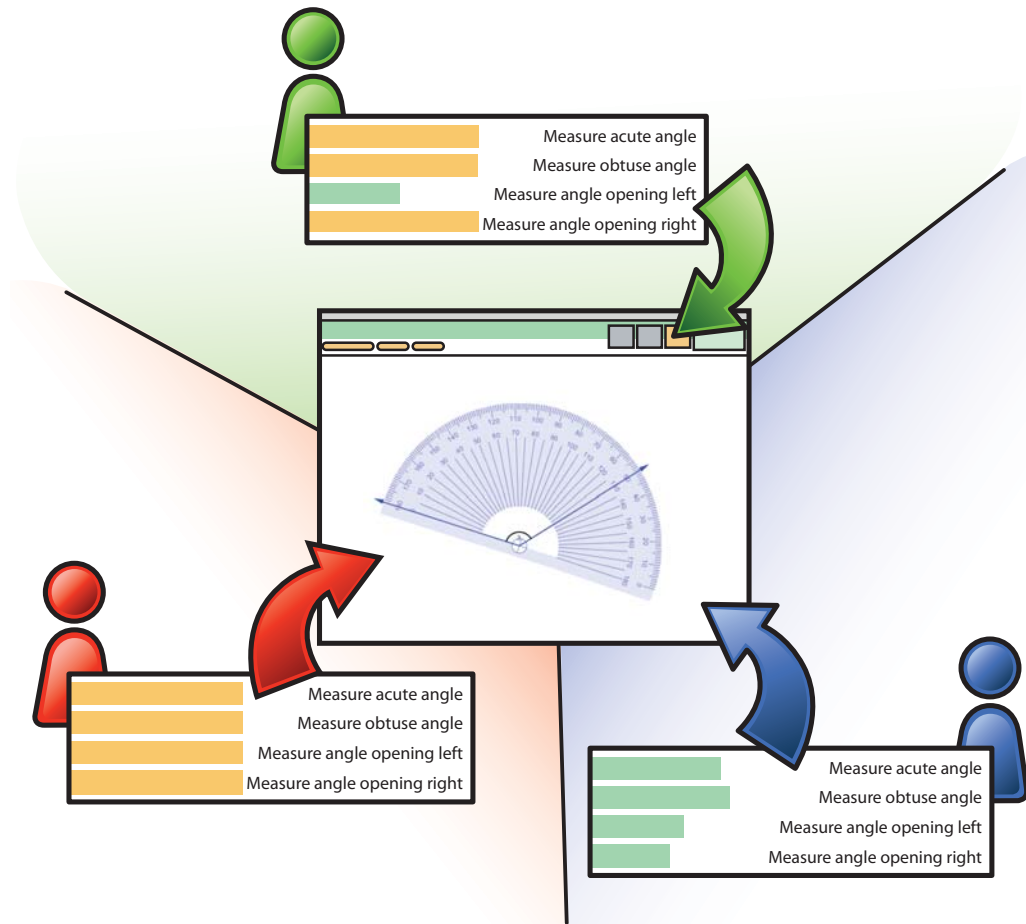
The adaptive technology in the Cognitive Tutor software offers the highest degree of individualized instruction to help students achieve proficiency in mathematics. We offer two levels of individualization that no other competing software system can match. First, a finely tuned skill algorithm for learning mathematics is at the core of the Cognitive Tutor software. This algorithm identifies student weaknesses and selects problems to help improve their skills where assistance is needed most.

Second, the Cognitive Tutor assesses and responds to students as they work through lessons. In fact, the Skillometer in the Cognitive Tutor reacts and traces student attempts at solving steps within a math problem. Finally, the Cognitive Tutor software dynamically addresses individual student needs as they work to solve problems and provides appropriate feedback and hints when needed.



# COGNITIVE TUTOR® ADAPTIVE INSTRUCTION

The Cognitive Tutor software adapts instruction for individual students. The way it individualizes instruction is unique because multiple skills are assessed at one time. The Skillometer bar chart depicts each student's skill strengths and weaknesses. Gold bars indicate mastery. The Skillometer device ensures that each student receives a sufficient number of practice math problems to achieve mastery before progressing to the next topic in the curriculum.



The gold bars in the Skillometer show this student mastered the skills needed to measure angles with a protractor.

The "red" student will progress to the next topic in the curriculum: classifying triangles, quadrilaterals, and polygons.



The Skillometer indicates this student has a strong understanding of measuring acute and obtuse angles correctly. However, the student had difficulty with measuring angles that opened to the left. Measuring these angles is slightly different because the student needs to use the inside scale on the protractor.

The "green" student will receive additional practice problem to master this discrete skill.



During the lab session, this student made a few errors classifying acute and obtuse angles. Furthermore, the student's tentative understanding was challenged by attempting to measure angles with a non-horizontal base.

The "blue" student will receive more problems related to classifying and measuring angles.



## Applied Research Model & Evidence of Effectiveness

Carnegie Learning is the leader in using cognitive science to develop a research-based model for how students learn. This model is the foundation for developing our adaptive technologies in the Cognitive Tutor software. In fact, we are the only publisher that has a continuous improvement model for enhancing our instructional software. Annually, we've collected over 42 million observations of students' studying (that's approximately one action for each student every seven seconds). We use the data to enhance our materials to provide the best fit for how students learn.

In numerous studies, Carnegie Learning solutions consistently have shown a significant effect on student learning outcomes resulting in improved academic achievement in mathematics. Please visit our research section at [www.carnegielearning.com](http://www.carnegielearning.com) to view the results.

## Key Features and Benefits

- » Continuous formative assessments
  - » All student actions are mapped to one or more underlying cognitive skill
  - » Cognitive Tutor® software picks activities to optimize time students spend working on skills they have not mastered
  - » Progression through the curriculum is based on mastery of individual skills
- » Custom curriculum sequencing for developmental math courses
  - » Curriculum can be re-ordered by unit
  - » Units can be added and deleted
  - » New sequences can be named and re-used
- » Multiple representations help change students make mathematical connections and deepen their understanding
- » Our non-traditional approach emphasizes developing mathematical reasoning and mastery of skills
- » Engaging real-world scenarios appeal to students of all abilities and learning styles
- » Embedded content and interactive examples drive students step-wise through example problems
- » Saves faculty time by negating the need to assign and grade traditional homework
- » Tracks all student activity via the Instructor's Toolkit software so that you can review progress and intervene at any time if needed

## Implementation & Training Services

Carnegie Learning offers flexible training options to help you achieve your implementation goals. We offer onsite and online training options. Your Regional Account Manager will consult with you to help you to select an option that is appropriate for your instructional team.

Carnegie Learning Developmental Math Solutions can be implemented to support a number of implementation models:

- » Tutoring resource in Campus Learning Center Labs
- » A software supplement to traditional Developmental Math courses
- » Using the Cognitive Tutor software as the primary source of developmental math instruction

Our adaptive technologies can help you best prepare your students to achieve proficiency in developmental mathematics. Please contact us today at 888.851.7094 or [www.carnegielearning.com/highered](http://www.carnegielearning.com/highered).

“Carnegie Learning’s software will serve as the core curricula used to help our students complete and pass our developmental math course more quickly so that they can move on to college-level mathematics.”

**Mary Monroe-Ellis**  
Dean of Transitional Studies at  
Pellissippi State Community  
Technical College



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The research-based leader in adaptive math instruction that fits how students learn and achieve.