Math Textbooks

Our textbooks help students understand relationships and make connections among different mathematical concepts.

Within a collaborative, student-centered classroom, students build on prior knowledge and obtain new knowledge by solving real-world problems that relate to their interests. This Learning By Doing® method helps students cultivate a depth of understanding in mathematics. Required to both construct and interpret mathematical models and explain their reasoning, students build a solid foundation to be successful in high school, in college, and in their careers.

Cognitive Tutor® Software

Our software differentiates instruction with ongoing formative assessment for mainstream and supplemental implementations.

Our unique solution provides students with highly individualized and self-paced instruction that adapts to their exact needs to improve their secondary math skills. Our supplemental instruction stands apart for strengthening student conceptual understanding of mathematics by integrating adaptive learning technologies, assessment, and rich problem-solving activities.

Professional Development

Our solutions support teachers, and can be coupled with our textbooks and software curricula or purchased independently.

We are working around the U.S. to build standards-based, student-centered curricula and effectively integrate technology to inform data-driven instruction. Through this partnership, districts build the teacher capacity needed to raise and sustain student achievement. Our goal is to support your team of teachers, coaches, and leaders to obtain the outstanding results that your students deserve.
Carnegie Learning has been proven effective in a variety of implementation models and with a wide range of student populations. The three most common models are illustrated below: blended, software and textbooks. Flexible implementation models can be supported with a comprehensive professional development plan that is customizable based on the needs of your school or district.

**Blended** (Software and Textbooks)
- Can be implemented as core, support class, double block, and more
- Supports ELL, gifted, IEP, and special education populations
- Supports Tier 1 and Tier 2 for Response to Intervention (RTI)

**Software**
- Implement anywhere with internet access: computer labs, libraries, media centers, or at home
- Can be implemented as supplemental, intervention, SES, extended learning, and more
- Supports ELL, gifted, IEP, and special education populations
- Supports Tier 1, Tier 2, and Tier 3 for Response to Intervention (RTI)

**Textbooks**
- Supports a collaborative, student-centered classroom
- Consumable textbooks that are updated annually
- Can be implemented as core, support class, double block, and more
- Supports ELL, gifted, IEP and special education populations
- Supports Tier 1 and Tier 2 for Response to Intervention (RTI)

**OUR UNIQUE APPROACH** » Our blended solution is unique in that students spend 3 days of their time in the classroom using our textbooks in an approach that involves task-based lessons, collaborative learning, and real-world problems and contexts. The remaining 2 days of students’ time is spent working in our Cognitive Tutor Software, which offers the most precise method for differentiating instruction available.

**We Can Customize Your Solution to Support Other Implementations**
- Common Core
  - Georgia Performance Standards
  - www.carnegielearning.com/ccgps
- Response to Intervention
  - www.carnegielearning.com/rti
- School Improvement
  - www.carnegielearning.com/sig
our 3 big ideas

1. Promote Deep Conceptual Understanding

Deep understanding means that concepts are well represented and well connected to other concepts. Carnegie Learning High School Math Series makes extensive use of models—real-world situations, manipulatives, graphs, and diagrams, among others—to help students see the connections between different topics. Your students will view mathematics as a set of related topics as opposed to a set of discrete topics. They will understand why algorithms work, as opposed to blindly memorizing procedures that only represent the how.

• **Real-world problems** help students connect their intuitive understanding of the world to formalized mathematics.
• Tasks emphasize active engagement with the conceptual basis of mathematical procedures.
• Our approach presents activities that use models, manipulatives and representations that provide students with opportunities to develop strategies and reasoning that serve as the foundation for learning more abstract mathematics.

Models help students to develop strategies and reasoning that serve as the foundation for learning more abstract math.

2. Engage and Motivate

Recent research regarding academic achievement shows that students’ beliefs about the nature of intelligence, their goals within a learning task, and their perception of academic expectations have strong effects on their academic performance. Carnegie Learning High School Math Series includes elements designed to guide your students toward appropriate and effective attitudes about learning.

• Our curricula creates a safe learning environment where students feel empowered to take risks. They see both success and failure as an opportunity to learn, rather than a judgment of their inherent ability.
• Carnegie Learning motivates students to think about and discuss the usefulness of mathematics in a variety of real-world contexts that are relevant to a high school student.
• Delivering math instruction in a student-centered, collaborative learning environment helps engage and motivate students. This approach helps students spend more time being active learners during class periods.

PROBLEM 2 How Tall is That Oak Tree?

1. You go to the park and use the mirror method to gather enough information to calculate the height of one of the trees. The figure shows you calculate the height of the tree.

The curricula contain a variety of real-world contexts relevant to high school students.
Formative assessment is a reflective process that promotes student learning. It is the part of instruction designed to provide crucial feedback for you and your students—to diagnose, not to assign a grade. The Carnegie Learning High School Math Series provides ongoing opportunities for students to be active participants in the learning process by expressing their knowledge and ideas to you, to their peers, and to themselves.

- Our curricula embeds self-explanation prompts within the learning materials that encourage students to more thoughtfully self-explain.

- It provides opportunities to monitor student knowledge and progress. In the text, open-ended question strategies provide opportunities to formatively assess the class as well as individual students. Our Cognitive Tutor Software uses the most precise method ever designed to differentiate instruction for students. Each keystroke is assessed and evaluated and new problems are selected based on each student’s individual needs.

What Educators Are Saying About Us

1. Promote Deep Conceptual Understanding

I’ve never worked with a program as comprehensive and engaging as the Cognitive Tutor. Students learn through the exploration of significant and realistic mathematical situations. They are able to truly comprehend subjects that have been abstract and theoretical. Students are more enthusiastic than their peers in the regular curriculum. I never hear, ‘When are we going to use this in real life.’

– LUIS DIAZ
Teacher, Felix Varela Senior High

2. Engage and Motivate

Students’ attitudes about math have improved tremendously. Now they look forward to math class, and some students even stay after school to work on the program. Teachers are passionate about its implementation as they continue seeing students make gains on testing. The Cognitive Tutor Software has helped transform the way math is taught and learned at Rigby.

– SHERRY SIMMONS
Principal, Rigby High School

3. Powerful, Ongoing Formative Assessment

The Cognitive Tutor has kept students engaged throughout the learning process. The computer assessments give teachers insight on which students need intervention help and which students need to be motivated with enrichment activities.

– BRIAN REEVES
Math Teacher, Green High School
Carnegie Learning textbook materials encourage active engagement and deep understanding of mathematics. The classroom model inspires students to learn with and from each other, and provides enough flexibility to accommodate many different learning environments. Our classroom activities address both mathematical content and process standards.

**STUDENT-CENTERED, COLLABORATIVE CLASSROOM**
Teachers facilitate learning and coach students to master math concepts and procedures, with little time spent on lectures. They lead students in completing task-based lessons and fostering discourse where students share solutions to problems and explain their mathematical reasoning.

**STANDARDS FOR MATHEMATICAL PRACTICE**
These standards have always been the foundation of Carnegie Learning textbooks. Our pedagogical approach focuses on how students think, learn and apply new knowledge. Teachers play a key role in incorporating these practices into the daily rituals of the classroom.

**CONSUMABLE TEXTBOOKS**
Our consumable textbooks provide an opportunity for extended investigations, analysis and alternate solution paths. Each student is given a text they can write in: to take notes, highlight key data in a problem, solve a problem, or write complete sentences to describe problem-solving strategies.

**REAL-WORLD SITUATIONS**
We use real-world situations in our math problems to help students see how math is relevant in their daily lives. Our math problems are designed to emphasize connections among verbal, numeric, graphic, and algebraic representations. The lessons are structured to provide students with various opportunities to reason, model, and explain mathematical ideas.
MATHEMATICAL DISCOURSE  »  Text icons prompt different forms of student communication. They may instruct students to work independently or with groups, or to share ideas with the class. Encouraging mathematical discourse provides opportunities for students to explain their thoughts and processes for solving math problems.

Student Materials

- **Student Edition**: Primary classroom resource that is a record of the students' thinking, reasoning, and problem-solving. Student lessons interleave questions, instruction, and worked examples to engage students as they develop their own mathematical understanding.

- **Student Assignments**: Provide opportunities for students to practice and apply their understanding of the mathematical objectives addressed in the corresponding student lesson.

- **Student Skills Practice**: A supplemental resource that provides targeted practice of discrete skills within each student lesson. Each worksheet contains two sections: vocabulary and problem sets.

- **Homework Helper**: Designed to help parents and caregivers be more informed about the concepts being covered in the student's math courses. It contains one activity per lesson, including examples of the skills taught in the lesson. (Only available for Bridge to Algebra and Algebra I curricula.)

- **Carnegie Learning Resource Center "Home Connection"**: Provides digital editions of the Student Edition, Student Assignments, and Student Skills Practice for viewing and printing, as well as additional resources for parents and caregivers to support students.

Teacher Materials

- **Teacher's Implementation Guide**: A resource for planning, guiding, and facilitating student learning. Additional questions are provided for the teacher to ask during the work and share phases of each student lesson. A lesson map provides the necessary materials to implement the lesson.

- **Teacher's Resources and Assessments**: Contains assessments for each chapter, including a pre-test, a post-test, a mid-chapter test, an end-of-chapter test, and standardized test practice. Answers to the student assignments, student skills practice, and assessments are also provided.

- **Carnegie Learning® Test Generator Powered By ExamView® Assessment Suite**: This online test bank allows teachers to edit individual textbook items and construct customized tests using content from assignments, skills practice and assessment questions.

- **Carnegie Learning Resource Center**: Provides digital editions of all student and teacher materials for viewing and printing. The Carnegie Learning Resource Center is a dynamic community that provides instructors with a variety of features, such as Online Professional Development, Administrative Reports, shared instructor resources, and more.
Cognitive Tutor Software Features
Cognitive Tutor Software was developed around an artificial intelligence model that identifies weaknesses in each individual student’s mastery of mathematical concepts. It customizes feedback, hints, and prompts within each problem to focus on the individual student's needs and solution path. The software then sends the student to new problems that address their specific skill deficiencies. Cognitive Tutor Software differentiates instruction with ongoing formative assessment for mainstream and supplemental implementation, and features the most precise method of differentiated instruction available.

**SKILLOMETER** » As a student becomes more proficient in a skill, the bars on the Skillometer increase in length and turn gold, indicating mastery. Teachers can view an immediate snapshot of each student’s progress, while students receive a dynamic, strong motivator to succeed.

**INNOVATIVE, RESEARCH-BASED PEDAGOGY** » Engages students directly in problem solving. Uses concrete, real-world scenarios. Prompts a student to think abstractly by converting situations into quantities and units.

**MULTIPLE REPRESENTATIONS** » Students work with multiple representations of a problem.
- The Solver encourages students to express the problem numerically.
- The Grapher displays the problem graphically in a coordinate plane.
- The Worksheet prompts students to convert word problems to mathematical expressions.
Teacher’s Toolkit
Our easy-to-use interface for performing administrative tasks in our Cognitive Tutor Software lets educators:

1. Manage instructors, classes, and students
2. Change student placement within curriculum
3. Resequence and customize curricula
4. View/print detailed curricula with the Curriculum Browser
5. Receive real-time feedback from the Custom Curriculum Advisor
6. View Student Activities to see how they are solving problems
7. Generate automated assessments such as pre- and post-tests
8. Produce Student Data Reports

INTERACTIVE EXAMPLES » These examples deliver on-screen, step-by-step instruction for each software unit. Students can see and engage in examples that promote a conceptual understanding of the problems being solved.

EMBEDDED ASSESSMENT » Offers continuous, formative assessment throughout the curricula. Delivers pre- and post-tests that automatically tie to custom sequenced curricula. The pre-test may be configured to be prescriptive, in which case results are used to set pacing for students in the instructional software.

JUST-IN-TIME FEEDBACK » Hints are contextual and oriented towards helping the student to solve key steps in the problem. Immediate feedback enables the student to self-correct and leads to more effective learning and applying of the mathematics.

REPORTS » Over 20 detailed reports document student activity in the software, including mastered skills, number of problems solved, errors and help requests. The reports use data to guide instructional decision-making.

Preview our Cognitive Tutor Software at: www.carnegielearning.com/demos

STUDENT DETAIL REPORT by SECTION

PRELIMINARY NOTE: Instructor, Sarah

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Get a Closer Look
The Carnegie Learning professional services team partners with school districts around the U.S. to build standards-based, student-centered curriculum and effectively integrate technology to inform data-driven instruction. Through this partnership, districts build the teacher capacity needed to raise and sustain student achievement. Our goal is to support your team of teachers, coaches, and leaders to obtain the results that your students deserve.

Our comprehensive professional development focuses specifically on three domains of effectiveness:

**IMPLEMENTATION FIDELITY**
- Initial Implementation Training
- Leadership Training
- In-Classroom Support
- Building Capacity, Train the Trainer
- Online PD

**DATA-DRIVEN ACCOUNTABILITY**
- Leadership Status Meetings
- Demographic Research for Individual Learning Plans

**TEACHER CONTENT KNOWLEDGE**
- Instructional Coaching
- Custom Professional Development
- Math Content Academies
- National Math Institute

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**Funding Sources for Professional Development**
There are numerous federal and local funding sources, including:

- Title I, Part A: Improving Basic Programs
- Title II, Part A: Teacher and Principal and Recruiting Fund Training
- Title II, Part B: Mathematics and Science Partnerships
- Title V, Part A: Innovative Programs
- Title V, Part B: Charter-School Programs
- State and local funding sources

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**Get a Closer Look**

Learn more about our professional development: www.carnegielearning.com/pd
additional benefits

Carnegie Learning educators also benefit from an array of our expert staff members and professional resources to help make their implementation as successful as possible.

Your Carnegie Learning Support Team

As a Carnegie Learning educator, you are supported by our team of customer service, sales, and professional development staff. To request help from your local support staff, reach out to us via the following methods:

- Email help@carnegielearning.com
- Call 877-401-CLCS (2527)

Carnegie Learning Free Math Webinar Series

These no-cost professional development sessions feature fascinating mathematics topics and are presented by education leaders, cognitive scientists and noted math experts. To register for any of our webinars, or to view previously recorded sessions, visit:

www.carnegielearning.com/webinars

Carnegie Learning® National Math Institute

Our annual four-day professional learning event provides math educators with:

- Effective mathematics instructional strategies for middle and high school
- Mathematics content knowledge to support individual student learning
- Expertise in implementing a successful standards-based, student-centered classroom
- Tools to monitor and sustain a successful Carnegie Learning implementation
- A network of colleagues to share best practices and innovative classroom ideas

nmi.carnegielearning.com

The Carnegie Learning Awards Program

The Carnegie Learning Awards Program recognizes and rewards outstanding accomplishments in the Carnegie Learning classroom and lab.

Each year, Carnegie Learning honors those students and teachers who have demonstrated exceptional dedication to teaching and learning mathematics. For more information or to nominate an instructor, student or school for the Carnegie Learning Awards Program, visit:

www.carnegielearning.com/awards

Learn more online: nmi.carnegielearning.com
Since 2006, Carnegie Learning has been committed to helping Georgia students succeed in mathematics by collaborating with school districts across the state to produce customized instructional materials that meet the state unit frameworks.

This is our journey...

**June 2008**

**July 2006**
GA DOE releases GM1, GM2, and GM3 Standards.

**March 2008**
GA DOE releases GM1 Curriculum Map.

**October 2008**
Carnegie Learning analyzes GM1 Frameworks and begins development of GM1, 2nd edition.

**February 2009**
Carnegie Learning revises GM2 Curriculum Map and modifies GM2 textbook accordingly, prior to release.

**March 2009**
Carnegie Learning offers no-cost online Professional Development webinars via ElluminateLive! to help maximize implementations.

**March 2009**
Carnegie Learning offers no-cost online Professional Development webinars via ElluminateLive! to help maximize implementations.

**June 2009**
Carnegie Learning offers no-cost online Professional Development webinars via ElluminateLive! to help maximize implementations.

**August 2009**
Carnegie Learning begins development of GM3.

**November 2008**
Carnegie Learning begins development of Skills Practice component including worked examples and odd answers based on user feedback.

**February 2009**
Carnegie Learning revises GM2 Curriculum Map and modifies GM2 textbook accordingly, prior to release.

**March 2009**
Carnegie Learning offers no-cost online Professional Development webinars via ElluminateLive! to help maximize implementations.

**June 2009**
Carnegie Learning delivers “Train-the-Trainer” Professional Development in GA to build capacity and certify the local district staff to monitor the implementation.

**August 2009**
Carnegie Learning begins development of GM3.

**2006**

**Fall 2007**
GA school districts are discouraged that there are no GPS-aligned textbooks available.

**Carnegie Learning** begins development of GM1, 1st edition.

**June 2009**
Carnegie Learning releases GM1, 2nd edition including a 70% change in content to accommodate the GA DOE changes.

**Carnegie Learning** releases GM2.
December 2011
GA DOE releases CCGPS for High School and Curriculum Maps.
Carnegie Learning responds to GA DOE, analyzes the CCGPS and adjusts development for the Coordinate Algebra Textbook.

Summer 2013
Carnegie Learning to release CCGPS Analytic Geometry and Advanced Algebra.

Summer 2015
Carnegie Learning to release revised and edited curriculum for Grades 6-11.

2012
Carnegie Learning to release CCGPS Coordinate Algebra.

2015+
On-going Professional Development provided by Carnegie Learning

Spring 2012
Carnegie Learning to submit CGPS Coordinate Algebra for GA state adoption.
Carnegie Learning begins development of CCGPS Analytic Geometry and Advanced Algebra.

Summer 2013
Carnegie Learning to release CCGPS Analytic Geometry and Advanced Algebra.

Summer 2015
Carnegie Learning to release revised and edited curriculum for Grades 6-11.

Summer 2010
GA DOE releases GM3 Frameworks and Curriculum Maps.

May 2011
Carnegie Learning begins development of 9th Grade CCSS instructional materials.

Winter 2010
Carnegie Learning launches the Student Resource Center, an online tool to support implementations providing online text access, based on customer feedback.

Spring 2012
Carnegie Learning to release CCGPS Coordinate Algebra.

March 2010
Carnegie Learning delivers “Train-the-Trainer” Professional Development in GA to build capacity and certify the local district staff to monitor the implementation.

August 2011
Carnegie Learning revises and enhances the Student Resource Center, based on customer feedback and launches new Home Connection site, geared toward accessing Carnegie Learning materials from home.
Carnegie Learning hires a Manager of School Partnerships, focused exclusively on the GPS and GA implementations.

Winter 2010
Carnegie Learning releases GM3.

» 2012
Textbook Published

Major Milestone

Milestone

...and our journey continues.
Applying Cognitive Science to Education

Carnegie Learning Cognitive Tutor Software represents an innovative application of technology, artificial intelligence, and cognitive science. The software gives students the opportunity to receive individualized attention, maximizing the amount of time spent actively learning and mastering fundamental thinking skills. Cognitive Tutor Software lies at the intersection of 3 key areas:

- **Cognitive Psychology Theory**: How students learn, retain and apply new mathematical knowledge, ACT-R (Adaptive Control of Thought) Theory
- **Computer Science Technology**: Artificial intelligence software applications including model tracing and identification of unmastered skills
- **Real-World Mathematics**: Real-world product development from decades of classroom experience

**ACT-R Theory**

Carnegie Learning is different from other educational publishers because we have a sound theoretical basis in the science of how people learn. Our cognitive models are based on Dr. John Anderson’s ACT-R theory of human cognition, a psychological model that is the foundation of Cognitive Tutor Software. This theory has been validated by hundreds of lab and field studies.

**Continuous Improvement**

Carnegie Learning does not just read the research on how people learn; we are active participants in this research and frequently publish results in refereed journals and conferences. To keep our curricula current, and to make certain the teachers using our curricula have the benefit of thorough research, we continue to support investigations into the efficacy of our software and textbooks.

**Our Commitment to Research**

- Built on extensive scientific research from Carnegie Mellon University, a global research institution.
- Winner of 2011 Benjamin Franklin Medal in Computer and Cognitive Science: Co-founder Dr. John Anderson awarded for his ACT-R theory. Past winners include Albert Einstein and Thomas Edison.
- Research fuels our development: we continuously collect and analyze data and feedback from schools, which enhances our curricula and results in more efficient learning.
- Active participation in the scientific community: we conduct field studies and frequently publish research reports and whitepapers.
- We use a rigorous empirical testing process resulting in over 50 publications validating the effectiveness of cognitive modeling.

**Get a Closer Look**

Explore 30+ research reports, whitepapers and reference documents online at: [www.carnegielearning.com/research](http://www.carnegielearning.com/research)
There is a simple reason why Carnegie Learning offers the most successful math curricula in the nation: We are the only math publisher that uses cognitive science as the cornerstone of its instructional design. We have collected more than 42 million observations into how students think, learn and apply new knowledge in math, then crafted the findings into customizable curricula that play to each student’s individual learning needs. This revolutionary strategy empowers students to produce significantly improved math scores in a diverse spectrum of school districts across the nation. By constantly innovating and developing new ways for students to learn, Carnegie Learning is ensuring that schools, teachers and, most importantly, students achieve greater success.
STUDENTS USING COGNITIVE TUTOR ALGEBRA I SOFTWARE:

- Demonstrate an 85% better performance on assessments of complex mathematical problem solving and thinking
- Have a 70% greater likelihood of completing subsequent Geometry and Algebra II courses
- Achieve 15–25% better scores on the SAT

DOCUMENTED MATHEMATICS SUCCESS ACROSS THE UNITED STATES!