STEMscopes ALABAMA MATH

Curriculum Feature

5E Lesson Model and CRA Approach

The 5E model has been a staple of effective instruction for decades. STEMscopes has already demonstrated unprecedented success by raising student scores through STEMscopes Science for Alabma. Now, we're incorporating the 5Es into math curriculum for the first time with STEMscopes Alabama Math. Centered on a gradual transition from teacher-led instruction to student-driven learning, the 5E model allows students to explore context before content, to develop a deep mathematical understanding of the standards.

The 5E Model	Description
Home	Find everything you need to prepare for instruction, including content support explanations, standards analyses, a materials list, introductory parent letters, and a lesson roadmap.
Engage	Diagnose students' background knowledge and engage them in new content with a short activity that ties in real-world connections.
Explore	Students explore concepts using virtual and real manipulatives to build upon their prior knowledge and to generate new ideas. Set-up videos help you preview the lesson, materials, set-up, and student outcome expectations.
Explain	Students use fun, collaborative grouping strategies, journaling, and visuals to share their understandings of the exploration activities.
Elaborate	Students are challenged to extend their conceptual understanding and apply their skills through differentiated activities, including games, reading passages, problem-based tasks, career connections, and interactive practices.
Evaluate	Students demonstrate their knowledge and skills through a variety of assessment types, including argumentation-based evaluations and multiple-choice / fill-in-the-blank style tests.
Intervention	Intervention provides Tier II and Tier III support for students struggling with the content.
Acceleration	Acceleration enables you to go beyond the assessment boundaries by using enrichment activities and real-world math news integration via the Associated Press.

CRA Approach

Embedded in STEMscopes Alabama Math is an approach called CRA: Concrete - Representational - Abstract. CRA combines behaviorist and constructivist instructional strategies to improve student understanding and retention of new math concepts. Through demonstration, modeling, guided practice, independent practice, and assessment (feedback), students shift from conceptual understanding toward procedural accuracy to fluency.

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Literacy Elements

Learning literacy—reading, writing, listening, and speaking—does not end at the ELA teacher's door. In fact, in order for students to be successful on the standardized tests, they need to be apt readers because these high-stakes tests are really math tests wrapped inside a reading test. By de-siloing math and reading and teaching across the content areas, we help students learn to be better problem solvers in math, while also understanding the value of literacy outside traditional settings. Below we highlight of our star teachers' favorite resources and which of the 4 dimensions of literacy they help with:

My Math Thoughts

This exercise challenges students to reflect on mathematical concepts from a content, process, and affective lens. After reflecting, students compare and contrast their thinking process in small group or classwide discussion.

Reading ◉○○ *Writing* ◉◉◉ *Listening* ◉◉○ *Speaking* ◉◉○

Math Story

These leveled reading passages fuse expository texts with problem solving. Comprehension questions provided in each story challenge students to read and interpret texts using ELA standards while applying math standards covered in the lesson.

Reading ◉◉◉ *Writing* ◉○○ *Listening* ◉○○ *Speaking* ◉○○

Picture Vocabulary

Reading, writing, and imagery come together to help students understand new math academic vocabulary. Great for use as a Frayer model, these cards are ideal for word walls, flashcards, and any student needing to master new vocabulary.

Reading ◉◉◉ *Writing* ◉◉◉ *Listening* ◉○○ *Speaking* ◉○○

Embedded Math Chats

Group discussion is vital to building students' listening, speaking, and comprehension skills. Found in each Explore investigation, Math Chats support the teacher in facilitating class discussion on the topics discovered in the Explore activity.

Reading ◉○○ *Writing* ◉○○ *Listening* ◉◉◉ *Speaking* ◉◉◉

Embedded Literacy Tools

Text-to-speech, dictionary-on-demand, highlighting, annotating, and more—students have access to a wide variety of online tools in STEMscopes Alabama Math to help them interact with on-screen text while learning math concepts.

Reading ◉◉◉ *Writing* ◉◉○ *Listening* ◉◉○ *Speaking* ◉○○

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Productive Struggle

Is math just a matter of getting the right answer? Of course not. Process and strategies matter as well: in order for students to understand, interpret, and apply math to the real world, they need to know how to arrive at an answer, not just what that answer is. Through productive struggle, we encourage students to think outside the box, collaborate with others, and ultimately learn different ways of solving common problems while developing a growth mindset. It's OK for students to experience some frustration throughout this process. Through scaffolded instruction, quality questioning, and dynamic problem-solving exercises, students develop deep mathematical thinking skills. Explore how our teachers do it below:

Hook

In the Hook, students react to a real-world visual math problem and question what they see. Combined with teacher facilitation points, this exercise allows students to wonder about the math needed to understand the scenario, different approaches to the situation, and what they still need to learn to fully understand the scenario.

Explore

Each Explore presents a hands-on investigation of key math concepts. Teachers can find in-depth questioning strategies, including Math Chats and reflections, throughout each Explore. Teachers act as facilitators by empowering student inquiry and inspiring confidence in their own problem-solving abilities.

My Math Thoughts

Using three avenues—content, process, and affective—students explain, evaluate, and connect math learning to their own lives. Teachers encourage students to think creatively, share in cooperative groups, and celebrate different ways of thinking. My Math Thoughts is an ideal milestone showing how student thinking has changed since the start of a lesson.

Problem-Based Tasks

This group-based Elaboration activity encourages students of all levels to apply a multitude of processes and strategies to real-world math problems. Debate and discussion are encouraged as students approach the problem through different lenses. Afterward, teachers can use best practices, such as gallery walks, to allow teams to share with others.

The 8 Keys to Supporting Productive Struggle

1. Call on students who may not have the right answer and invite them to participate
2. Praise process and strategy vs. getting the right answer / being smart
3. Showcase creative problem-solving samples over high scores
4. Challenge students with problems that require out-of-the-box thinking (not just formulas)
5. Provide timely, informative feedback
6. If students are struggling, let them—don't give them easier work
7. Give students ample time to question, try, and experiment with ideas
8. Foster a growth mindset in your classroom