



Friday Focus

Carter County Schools

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An Effective Mathematics Environment

There are some specific teacher behaviors that "matter" in the teaching of mathematics. In effective classrooms, teachers:

- **Demonstrate acceptance of students' divergent ideas.** They challenge students to think more deeply about the problems they are solving and ask them to explain the solutions. Such an approach also helps students develop confidence in their own abilities to do mathematics and gain an even firmer grasp of key concepts and processes.
- **Influence learning by posing challenging and interesting questions.** Teachers should present questions that stimulate students' curiosity and encourage them to investigate further. The questions should encourage students to rely on themselves and their peers for ideas about mathematics and problem-solving.
- **Project a positive attitude about mathematics and about students' ability to "do" mathematics.** This includes demonstrating enthusiasm for the content as well as a belief that all students are capable of learning the material, with lessons designed to encourage curiosity, interest, and skill-building.
- **Certain instructional characteristics also are associated with effective mathematics instruction.** By integrating the following approaches into classroom instruction, teachers can promote both student learning and motivation:
- **Students are actively engaged in doing mathematics.** They should not be sitting back watching others students solve problems.
- **Students are solving challenging problems.** Mathematics is a stimulating and interesting field generating new knowledge every day, and students should be exposed to this excitement and challenge, using real-world examples when possible.
- **Interdisciplinary connections and examples are used to teach mathematics.** For example, using

literature as a springboard for mathematical investigation is a useful way to introduce authentic problem-solving situations that may have "messy" results. This engages students in connecting the language of mathematical ideas with numerical representations and develops important skills that support students' abilities to solve word problems.

- **Students are sharing their mathematical ideas while working in pairs and groups.** Research shows that students who work in groups on problems, assignments, and other mathematical investigations display increased achievement. Such opportunities appeal to the social nature of most children, while thinking through problems collaboratively makes it less likely that a student will get caught in a procedural dead end.
- **Students are provided with a variety of opportunities to communicate mathematically.** During a lesson, students should have many opportunities to communicate their ideas. They may draw a picture to represent their ideas or write them in mathematics journals. Whole-class discussions should provide opportunities to hear about and perhaps challenge other students' ideas in an environment of respect and understanding.
- **Students are using manipulatives and other tools.** The long-term use of mathematics manipulatives is positively related to student achievement and attitudes about mathematics. It is not enough, however, to simply provide students with manipulatives; they must be taught how to use these materials. Several steps can be taken to ensure students benefit from a lesson involving manipulatives. First, the teacher should use manipulatives that support the lesson's objectives. Next, before allowing students to handle the materials, the teacher should demonstrate how to use the manipulatives and the procedures for handling them. And finally, the lesson design should encourage the active participation of all students (Ross and Kurtz 1993).

(National Council of Teachers of Mathematics)

Reading in Math

Mathematics teachers can use reading strategies in several ways. They can model the reading process by reading the problem out loud and paraphrasing the author's words and then talking through how they use context clues to figure out word meanings. Before reading, teachers can ask questions that they want students to consider as they approach a mathematics problem. Teachers can probe about the reading's vocabulary by asking questions such as, "Are we clear on the meaning of all of the words?" or "Does the context help or should we look the word up?" Also significant are questions about the meaning of the problem, such as, "Can I paraphrase the problem?" "Does the problem make sense to me?" or "Does my understanding incorporate everything I've read?"

Reinforcing the idea that a piece of mathematics text needs to make sense (and that it can make sense) is exceedingly important.

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[Common Core Sheets](#)

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Upcoming Events

- April 25 AP Science Study Session @ ECHS
- April 28 Prichard Academy
- April 29 Heritage Academy
- April 30 Star Academy
- May 18-June 1 KPREP Testing Window