Researchers suggested different ways to have an effective classroom. What do the researchers say about teaching and learning mathematics? Some of them are: teachers must encourage students to work cooperatively with others, use group problem-solving to stimulate students to apply their mathematical thinking skills, and students’ interaction in ways will support and challenge one another’s strategic thinking. Teachers may give activities structured in ways allowing students to explore, explain, extend, and evaluate their progress. In addition, there are three critical components to effective mathematics instruction: teaching for conceptual understanding, developing children’s procedural literacy, and promoting strategic competence through meaningful problem-solving investigations.

Students in the high school are experiencing important crossroads in their mathematical education. They are “forming conclusions about their mathematical abilities, interest, and motivation that will influence how they approach mathematics in later years.” Instruction in the high school should build on students’ emerging capabilities for increasingly abstract reasoning, including: thinking hypothetically, comprehending cause and effect, reasoning in both concrete and abstract terms, observation and data collection, and could emerge from “big idea” questions such as: Algebra readiness.

What instructional strategy are the teachers looking for to expand? What are the expected outcomes of the classroom observation? During the observation, data is collected by the classroom observer while the teacher teaches the lesson. The observer collects data regarding only the focused question that was agreed upon during the pre-conference. The tool for data collection must match the purpose of the observation. After the observation, the classroom observer and teacher meet for a post conference. During that time, the teacher looks at the data that is collected, and the observer asks the teacher what he/she notices from the data. Based on the teacher’s responses, a conversation focusing on the questions addressed during the pre-conference. It is entirely possible (and, indeed, likely) that the focused question is not answered,
but the post-conference conversation results in an additional list of questions that can guide continuing classroom observations and post-observation discussions. What should the teacher be doing? In an effective mathematics classroom, an observer should find that the teacher investigating meaningful real-world problems whenever possible.

Mathematics is not a stagnant field of textbook problems; rather, it is a dynamic way of constructing meaning about the world around us, generating new knowledge and understanding about the real world every day.

Making interdisciplinary connections is also useful in a mathematics classroom. Mathematics is not a field that exists in isolation. Students learn best when they connect mathematics to other disciplines, including art, architecture, science, health, and literature. Using literature as a springboard for mathematical investigation is a useful tool that teachers can use to introduce problem solving situations that could have “messy” results. Such connections help students develop an understanding of the academic vocabulary required to “do mathematics” and connect the language of mathematical ideas with numerical representations.

Reference