

What Should I Look for in a Math Classroom?

A math classroom should provide practical experience in mathematical skills that is a bridge to the real world of jobs and adult responsibilities. This means going beyond memorization to enter a world of reasoning and problem solving. Sounds good, but how can you recognize a good math classroom when you see one?

Look for the following actions by students and teachers. If you see them, you will be looking at a classroom that is preparing students for the world beyond school.

What are students doing?

1. Interacting with each other as well as working independently, just as adults do.
2. Using textbooks as one of many resources. Students should know how and when to use manipulatives and technology as problem solving tools.
3. Applying math to real life problems and not just practicing a collection of isolated skills. Lots of time is allowed for solving complex problems.
4. Seeking a best solution among several solutions to a problem. Students can explain the different ways they reach these solutions and defend the choice of one solution over another.
5. Working in groups to test solutions to problems with each group member highly involved.
6. Communicating mathematical ideas to one another through examples, demonstrations, models, drawings, and logical arguments.
7. Working in teams to challenge and defend possible solutions. Students help each other to learn.

What are teachers doing?

1. Guiding students in exploring multiple solutions to any problem; challenging student to think deeply.
2. Moving around the room to keep everyone engaged in productive work.
3. Encouraging students to raise and discuss questions about math for which there are no textbook answers. Rather than simply answering these questions, teachers are helping students to gain mathematical competence and confidence by finding their own solutions.
4. Guiding students in making appropriate use of manipulatives and technology.
5. Promoting student use of inquiry and creativity. Students are moved to higher levels of learning and pursuing alternative approaches to solving a problem or by proposing new problems that are variations or extensions of a given problem.
6. Bringing a variety of learning resources, including guest presenters, into the classroom in order to increase learning options for all students.
7. Working with other teachers to make connections between disciplines in order to show how math is a part of subjects that students are studying.
8. Using assessment that focuses on problem solving and understanding rather than on memory and speed.
9. Helping all students to explore career opportunities that use the mathematics they are learning.

Mathematical thinking is an all-purpose tool. It can be applied throughout a lifetime to recognize and clarify problems, locate and interpret relevant information, explore alternative solutions, and defend rational decisions with conviction.

Source: *From Math Leads the Way*, Annenberg Foundation

Ideas for Designing a Standards-Based Classroom

1. Think about what you want to assess—the kinds of problems and the mathematics content. Make a form to keep track of the concepts, skills and kinds of problems.
2. Introduce the student to the concept of keeping a math journal or log for reflections about math problem solving and use of mathematics within and outside the classroom.
3. Enlarge rubrics and post in room.
4. Make certain that math folders and portfolios are personalized. Allow students to decorate them. Also make certain that students can have easy access to folders that they can be managed by the students and not by the teachers. Include a record keeping sheet so students can record the results of their performances.
5. Be certain to write a letter to parents explaining the use of performance tasks and rubrics.
6. Include criteria language in feedback to students so students can measure their own performance and develop the ability to be self-evaluative.
7. Develop a system for students to self- and peer-assess their work.
8. Invite other teachers to double score your students' work.
9. Develop a system for students to use technologies on a regular basis.
10. Provide access for students to communicate with mathematicians within and outside the school system.
11. Conference with students before writing report cards.
12. Devote at least one class per week to a performance task with rubrics.
13. Divide math instructional time into two types – one of them for modeling, group investigations, etc., and the other for individual or group problem-solving tasks.
14. Include open-ended problems in homework assignments on a regular basis.
15. Create a “free mathematics” time similar to silent reading time.
16. Develop problems to complement your language arts, science, social studies, or other units.
17. Assign a performance task as an introduction to a new topic or concept.
18. Use a performance task to culminate a unit or chapter.
19. Work with a teacher from another class or discipline to plan and “do” an interdisciplinary performance task.
20. Consider local events or needs as you plan realistic tasks for students to solve.