
Attitudes Towards Mathematics

The following are positive attitudes towards mathematics that we want students to develop.

1. **Mathematics is Beautiful and Powerful.**

We want students to experience joy in the discovery of mathematics and satisfaction in its mastery. By showing students topics in mathematics that they don't usually get to see in the classroom, we help them to put what they learn in their high school courses in a larger context and be more inspired to learn all kinds of mathematics. We also connect mathematics to the students' lives, and give them the opportunity to explore topics and discover the material through their own investigations. To accomplish this, many of our lessons involve hands-on activities and guided discovery.

2. **Mathematics is Important in Everyone's Day-To-Day Life.**

We want to connect mathematics to the students' day-to-day experiences. We want them to understand that mathematics is not some esoteric subject that has no relevance in their lives. Instead it is highly applicable and useful for them. We also want the students to see how mathematics can help them in their educations and careers and encourage them to attend college and to major in mathematics or mathematics-related subject.

3. **Hard Work is Valuable for Learning Mathematics.**

We want students to understand that hard work is more important than talent. Mathematics is not a realm reserved for a select few with innate ability, but instead is open to anyone who wants to think and work to understand. We want the students to know that they can be good at mathematics, and that mathematical ideas are within their reach.

4. **Mistakes are Important in Learning Mathematics.**

Mistakes are opportunities for learning. They allow one to identify where more work is needed. Taking the time to understand why an answer is wrong or why a particular approach does not work leads to a deeper level of understanding. If you are not making mistakes, then what you are doing is too easy for you --- you're not growing and you're not learning. Research on the brain, and in particular the study of neuroplasticity, shows that our brains actually change their structure and build new neural pathways when we struggle with mistakes. As we make efforts to understand and fix mistakes, we train our minds to deal with those problems until the methods we use become easy and automatic. One should not be afraid of making mistakes. Instead one should welcome mistakes as an essential part of learning.

5. **Mathematics is Open to Everyone.**

We want students to know that they can be mathematicians. There are opportunities open to them, and doing mathematics is an egalitarian activity open to all regardless of gender, race, sexual orientation, or socioeconomic background.

6. **Mathematics Equals Opportunities.**

Mathematics is the great equalizer. We want students to realize that the more mathematics they know, the more doors that will be open to them in the future. We want them to understand that mathematics arises in many jobs and careers in our modern world, and that their lives and their futures can be improved by their knowledge of mathematics. Moreover, many people dislike and fear math, and there are not enough people graduating from colleges with the mathematics needed to help society. This is causing a serious shortage in many really important fields, such as science, technology, engineering, and medicine. As such, it seriously threatens the future of our country. We want to encourage students to go to college and consider majoring in a math-related field, both for the benefits it will give them as well as the contributions they will make to society.