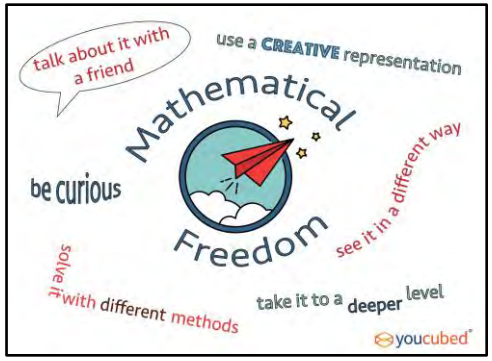
# Why is Bringing Awareness To and Providing Support for Math Anxiety Important?

More than any other subject, math learning causes anxiety and avoidance in many individuals. If not actively addressed and worked on, math anxiety and avoidance can result in permanent roadblocks in math learning (Tobias, 1995).

In today's society, the need for and use of math is greater than ever. Bringing awareness to and providing support for those who struggle with math anxiety is important because of the potential long-term impact it may have on various aspects of individuals' lives (Ashcraft, 2002; Boaler, 2008; Zaslavsky, 1994).

The teaching and learning of math must be viewed in a positive light. Traditional teaching and learning methods should be re-examined and individual learning styles and skills taken into account when addressing math anxiety and strategies to overcome it (Mammarella, Caviola, & Dowker, 2019; Tobias, 1995).




## Resources

**Story Books**

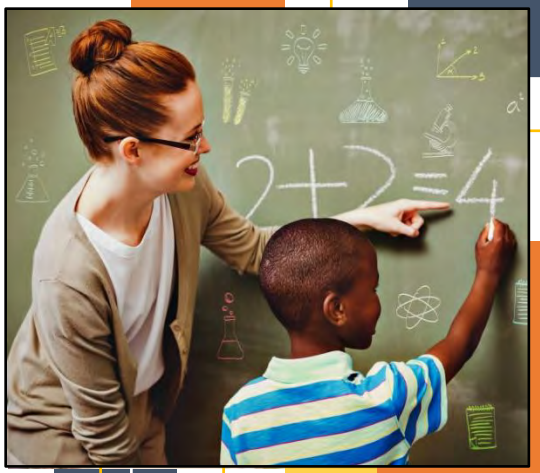
- *When Sophie Thinks She Can't* by Molly Bang
- *I'm Trying to Love Math* by Bethany Barton
- *Math Curse* by Jon Scieszka and Lane Smith
- *Nothing Stopped Sophie: The Story of Unshakable Mathematician Sophie Germain* by Cheryl Bardoe
- *Last to Finish: A Story About the Smartest Boy in Math Class* by Barbara Esham

**Informational Texts**

- *Teaching Math with Meaning* by Cathy Marks Krpan
- *Help Your Kids With Math* by Barry Lewis
- *Making Math Meaningful to Canadian Students, K-8* by Marian Small
- *What's Math Got to Do with It?: How Teachers and Parents Can Transform Mathematics Learning and Inspire Success* by Jo Boaler
- *Doing Mathematics with your Child, Kindergarten to Grade 6 – A Parent Guide* by Ontario Ministry of Education

**Websites and Programs**

- math.thelearningexchange.ca (educator resources)
- edugains.ca / youcubed.org
- The Robertson Program, Inquiry-Based Teaching in Mathematics and Science
- Mathletics / Buzz Math / Prodigy Math / Math Central



# Fostering Positive Attitudes to Overcome Math Anxiety

# What is Math Anxiety?

Math anxiety can affect anyone, including students, teachers, and parents (Boaler, 2017). It may be triggered when opening a math book, checking a receipt, or by simply hearing the word 'Math'! It may be apparent through physical symptoms and one's behaviour, such as sweaty palms, worried facial expressions, and task avoidance. Marian Small (n.d.) notes that individuals with math anxiety also show their anxiousness in the way they handle mistakes.

Math anxiety is defined as, an apprehension and fear when dealing with numerical information (Beilock & Maloney, 2015). It is an adverse emotional reaction to math or the prospect of doing math (Beilock & Maloney, 2012).

Math anxiety does not mean an individual lacks math skills, it means their worry about math impedes their engagement and achievement in math. It compromises their working memory, which is part of the cognitive system that regulates and controls the task at hand (Beilock & Maloney, 2012). It also prevents the individual from even attempting any math tasks. Motivation and practice is known to contribute to improvements in math skills (Beilock & Maloney, 2015).

# Best Practices for Mathematics Learning and Teaching

**Strategies for students include –**
(Beilock & Maloney, 2015; Furner & Duffy, 2002; Stodolsky, 1985)

- Teaching with manipulatives and technology
- Providing many opportunities to engage in collaborative learning with peers
- Valuing process and understanding of mathematics concepts, over rote memorization in students' work
- Recognizing triggers for math anxiety and implementing coping techniques, such as positive self-talk, visualizing success, and journaling

**"MY students get a lot of time to work on independent projects. And often these projects turn into integrated math learning experiences, like when Eli built a city with paper strips and started measuring his buildings. This is also a great time for collaborative learning."**
Grade 1 Teacher, Bedford Park PS

**"I try to point out to my daughter how math is used in everyday activities as much as I can. And I try to make math learning fun for her! So it's not like just drilling information."**
Student Parent, MA CSE Program


**Strategies for teachers include –**

- Providing pre-service math programs that emphasize collaboration, the use of manipulatives, and opportunities for reflection on past math experiences (Gresham, 2007; Harper & Daane, 1998; Swars, Daane, & Giesan, 2006).
- Providing pre-service teachers with opportunities to have mastery experiences teaching mathematics and observe model teachers in action (Swars et al., 2006).

**Strategies for parents/caregivers include –**

- Hosting family math nights to help parents become more familiar with the math their children are learning at school to becomes more comfortable and confident in how to support children at home (Furner & Berman, 2003).
- Encouraging parents to teach their child math concepts through everyday activities, such as cooking, shopping, and travelling (Jay, Rose, & Simmons, 2018).