Partnering with Your Teen in Mathematics

Grades 7 to 12

A Note to Parents:

Teens have many experiences that may impact their attitude and confidence in their mathematical ability. You can help your teen celebrate each success and deal with any challenges. You do not have to do the mathematics your teen brings home. What matters most is your attitude about the work they are doing.

Attitudes about mathematics and confidence in abilitites in mathematics can have a great influence on success at school.

This resource is intended to help you support your teen with learning mathematics in grades 7 to 12.

It is guided by the belief that all students can be successful in mathematics and all parents can be successful in supporting their teens in learning mathematics.

Note: The word ***parent*** refers to parent, guardian, caregiver and other family member who help children learn mathematics.

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"Parents have an important role to play in supporting student learning. Studies show that students perform better in school if their parents or guardians are involved in their education."

The Ontario Curriculum, Grade 9 and 10: Mathematics, page 4, 2005

Understanding Adolescent Learners

Understanding what teens experience as adolescents can be very helpful when supporting their mathematical learning. Adolescents experience rapid change and growth in four main areas: cognitive, emotional, physical, and social.

What is happening:		How to support your teen:
Your teen's problem solving skills and ability to reason and think logically are increasing.	**Cognitive**	Encourage your teen to think reflectively and to explore more than one way to solve each problem.
Your teen may feel emotions more intensely and not know how to control these emotions.	**Emotional**	Be aware of your teen's feelings about learning mathematics. Model a positive attitude towards the learning.
Your teen may do less physical activity and sleep patterns may change.	**Physical**	Encourage your teen to explore the mathematics involved in physical activities such as looking at the differences in heart rate after walking or running.
Your teen may be exploring how to interact with peers and society.	**Social**	Explore with your teen possible career choices and the mathematics that is involved.

For more information see Stepping Stones, Ministry of Children and Youth Services, June 2012: www.ontario.ca/steppingstones

Different Ways of Learning

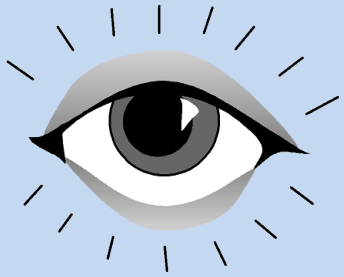
We all learn differently. We all have a preferred learning style and your teen may learn in a different way than you. The following ideas may be useful for conversations about how your teen likes to learn.

Visual Learners

Like to make notes, charts, and diagrams

Remember things by storing a mental picture

Like written instructions



Auditory Learners

Prefer listening to instructions

Remember or try to understand using self-talk

Learn by talking and listening

Kinesthetic Learners

Like to learn actively by doing

Make gestures when speaking

Move around a lot when studying or trying to understand something

Reference: Differentiated Instruction Scrapbook, Ministry of Education, 2010.

Conversations with Your Teen

Having conversations with your teen about learning mathematics will show you are interested.

Conversation Starters:

Show me something you are learning in math class.

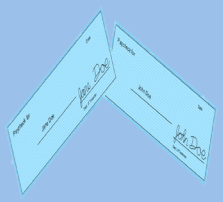
I heard that interesting technologies are being used in math class to solve problems. Show me an example?

What do you do when you have difficulty solving a math problem?

You can help your teen develop a positive attitude toward learning mathematics by modeling how to deal with challenges you encounter when doing mathematics in your own job and daily life. You might show how you deal with errors or how you persevere through a problem.

Daily life activities you can discuss with your teen:

Paycheque



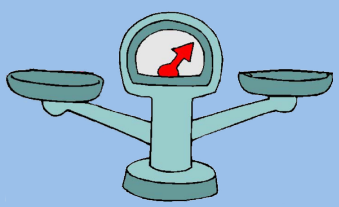
Cell Phone Plans

Carpeting a Room

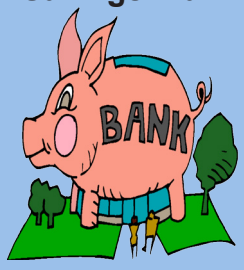
Grocery Bills

Clothing Costs

Family Budget



Savings Plan



Conversations with Teachers

Parents and teachers are partners in helping teenagers develop their unique identities as learners. It is important for parents to connect with their teen's teacher. The following questions are helpful to start the conversation.

You could ask your teen's teacher:

What strategies do you use when my teen is challenged with the math?

How does my teen access support if and when needed?

What are some of my teen's strengths? challenges?

Describe what is expected from my teen to be a good problem solver.

What can we do at home to help improve my teen's problem solving skills?

Continuing the Conversations

As your teen continues to grow and develop as an adolescent and as a mathematics learner, it is important to help your teen identify strengths and goals for next steps in learning.

"The greater the support that families provide for their children's learning and educational progress, the more likely that their children will do well in school and continue on with their education,"

A New Wave of Evidence: The Impact of School, Family, and Community Connections on Student Achievement,
Karen Mapp and Anne Henderson, 2002

Developing Mathematical Thinking

Teachers use a variety of questions to help students develop their mathematical thinking.

The Ontario Mathematics Curriculum outlines seven mathematical processes that support the development of mathematical thinking: problem solving, reasoning and proving, reflecting, selecting tools and computational strategies, connecting, representing, and communicating.

The following are questions you can ask your teen to help your teen develop mathematical thinking.

Problem Solving:
What is this problem about? What could you do to explore the problem? What questions do you have about the problem?

Reasoning and Proving:
How can you check to see if your answer is correct? How would you convince someone else that your answer is correct? Describe any cases in which your solutions will not hold true?

Reflecting:
Does this problem make sense to you? What does your answer mean? What strategies did you use to try to solve the problem?

Selecting Tools and Computational Strategies:
Which tool or strategy could you use to solve the problem? How do you know your strategy works? What other tool or strategy could you have used to solve the problem?

Connecting:
What other problems have you solved like this? When might you use something like this in real life? How is this related to other mathematics you have learned?

Representing:
How have you shown your mathematical thinking? In what other ways could you represent this? (diagram, table, graph…)

Communicating:
How might you organize your solution so someone else can follow your thinking? How could you make your mathematical thinking clearer?

Developing Learning Skills and Work Habits

"The development of learning skills and work habits is an integral part of a student's learning."
Growing Success, Assessment, Evaluation, and Reporting in Ontario Schools, page 10, 2008

"Students benefit when…teachers and parents work with students to help them develop these skills."
Growing Success, Assessment, Evaluation, and Reporting in Ontario Schools, page 13, 2008

*Your teen may be **responsible** for:*
- *completing assignments*
- *participating positively in classroom discussions and activities*
- *preparing for tests*
- *seeking help when needed*

Responsibility

Talk to your teen about what is happening in his or her mathematics class.
Encourage your teen to complete tasks on time with care.

*Your teen may need to **organize**:*
- *notes taken in mathematics class*
- *learning materials (e.g. rulers, protractors, calculators)*
- *his or her time to work on mathematics assignments*

Organization

Support your teen to be organized by finding a spot at home that your teen can post important dates for mathematics class.
Work together with your teen to find ways to be organized that suit your teen's learning needs.

*Your teen may need to be more **independent** in:*
- *identifying strengths, setting goals for improvement and determine next steps*
- *solving mathematics problems before seeking help*

Independent Work

Help your teen identify what is going well and what needs to be worked on next.
Encourage your teen to persevere in solving problems.

*Your teen may need strategies for **collaboration** such as:*
- *listening*
- *respecting other's thinking*
- *responding with an appropriate tone of voice*

Collaboration

Help your teen to be collaborative by sharing strategies you use to work with others.
Create opportunities for your teen to work with classmates outside of school to work on mathematics assignments. This will allow your teen to see different approaches to solve a problem.

*Your teen may need to take **initiative** in:*
- *working on mathematics assignments without being prompted to do so*
- *exploring mathematics beyond the classroom*

Initiative

Help your teen to be curious about mathematics by being curious yourself.
Talk with your teen to find out what your teen finds interesting and challenging in mathematics.

*Your teen may need help to **monitor**:*
- *progress with difficult math questions*
- *areas of learning needing attention*
- *progress of goals that have been set*

Self- Regulation

Help your teen to identify an area of strength and an area that needs improvement.
Encourage your teen to set goals and to seek extra help when needed.

For more information on learning skills and work habits see Growing Success: Assessment and Evaluation, and Reporting in Ontario Schools, Ontario Ministry of Education, 2010.

Supporting Your Teen with Planning and Transitions

Planning

It is important to have ongoing conversations with your teen about your teen's strengths, interests, and future goals. Prior to entering grade 9, choices will need to be made about which mathematics courses best match your teen's needs and goals. It is helpful for your teen to make a plan and adjust it as interests and goals change. Encourage your teen to discuss the plan with a mathematics teacher and guidance counselor so they can help your teen select the appropriate mathematics courses throughout secondary school.

When working with your teen to make a plan you may want to discuss your teens's:

- learning style
- strengths in mathematics
- strengths in other subjects
- interests outside of school
- future goals

When discussing your teen's post-secondary goals, it might be helpful to:

- find information about college, university, and apprenticeship programs available and the requirements (http://www.tcu.gov.on.ca/eng/)
- connect your teen with adults who have careers of interest
- ask if career planning at school has been discussed and what careers seemed to best match identified strengths
- make a list of pros and cons for different future career options

Transitioning from Elementary to Secondary Mathematics

Teens experience changes in learning mathematics as they progress through grades 7 to 12. You can help your teen with these changes by:

- helping in the decision making about course selections
- talking about new experiences
- making effective plans to cope with change

The following are examples of questions you can ask your teen:

How is math class the same as last year?

How is math class different from last year?

Changes in mathematics class

How is asking for help the same as last year?

How is asking for help different from last year?

Asking for help when needed

What do you think it will be like to do a final exam or project in your math course?

What are some things you can do to prepare for it?

Preparing for final projects and exams

Resources

The following is a list of ministry produced or licensed resources and supports to aid your teen in learning mathematics. Resources can be accessed at www.mathies.ca.

Digital interactive mathematics activities with games, quizzes and learning tools designed to develop mathematical understanding.

Virtual practice with feedback designed to complement the Ministry of Education's Gap Closing materials.

Software used to explore mathematical concepts by constructing, measuring and manipulating geometric objects.

Online interactive simulations used to explore mathematical concepts by measuring, recording data, calculating, graphing and manipulating information.

Free online math help resource for students in Grades 7-10. Homework Help provides live one-on-one tutoring from Ontario teachers Sunday to Thursday from 5:30pm – 9:30pm ET.

Digital mathematics activities aligned with the Ontario Curriculum Kindergarten to Grade 12.

Working In Number Sense (WINS) is a series of tasks for students to work through with a learning partner to develop key mathematical understandings in the Number Sense and Numeration strand of the Ontario Mathematics Curriculum.