

Mental math and estimation enable students to

- quickly recall basic number facts
- judge the reasonableness of an answer
- become efficient problem solvers
- apply mathematics strategies in everyday situations
- engage in mathematical thinking
- build confidence in their mathematical ability

Computing mentally to find approximate or exact answers is one of the best means of developing and deepening a learner's understanding of mathematics.

Math Time

In grades 1–9, Math Time includes five minutes every day for mental math and estimation! And it all adds up to over 130 hours of mental math and estimation by the end of grade 9.

Teachers need to

- model a variety of strategies
- introduce, practise, and reinforce strategies
- help students to understand why particular strategies work
- engage students in a variety of mental math and estimation activities
- link mental math and estimation skills to everyday life situations
- provide daily practice of mental math and estimation strategies
- inform you and your child of learning expectations

The family needs to

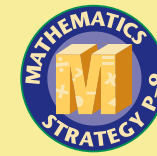
- help your child recognize where mental math and estimation can be used
- encourage your child to use mental math and estimation when completing homework
- talk to your child about the mental math strategy he or she is learning and have him or her demonstrate it
- stress the importance of solid mathematics skills in today's world



This pamphlet is part of a series to inform parents about the Nova Scotia Department of Education Public School Program for students in grades 7–9.

For more information, contact your child's teacher.

Let's talk about ...



Mental Math and Estimation Grades 7–9



The Atlantic Canada Mathematics Curriculum is shaped by a vision which fosters the development of mathematically literate students who can extend and apply their learning and who are effective participants in an increasingly technological society.

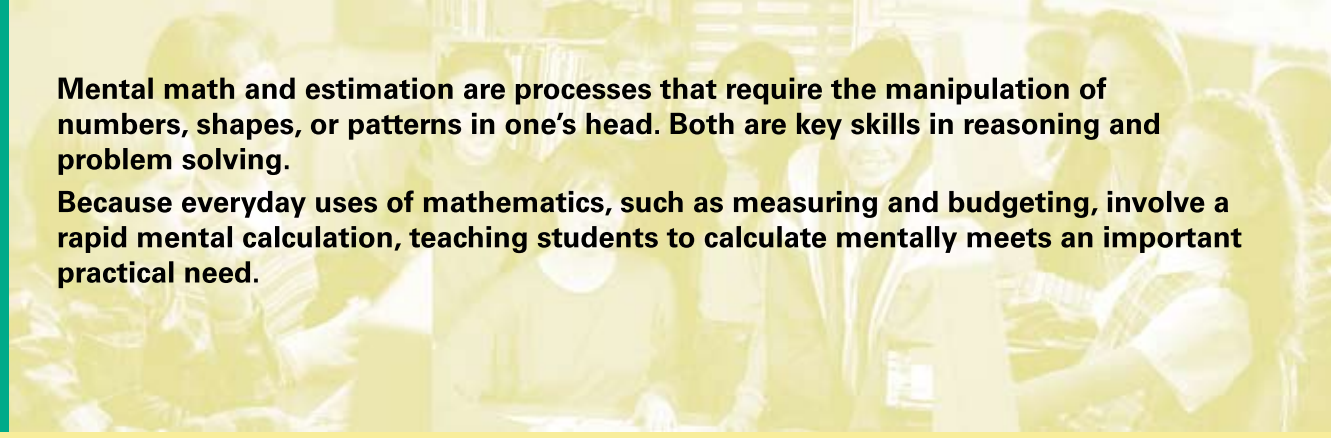
Let's Talk about...

Mental Math and Estimation

Grades 7–9

Mental math and estimation are processes that require the manipulation of numbers, shapes, or patterns in one's head. Both are key skills in reasoning and problem solving.

Because everyday uses of mathematics, such as measuring and budgeting, involve a rapid mental calculation, teaching students to calculate mentally meets an important practical need.



Mental Math

- leads to an exact answer
- develops strong visualization skills
- builds on addition, subtraction, multiplication, and division facts that are necessary to good estimation skills
- encourages the use of various strategies to find answers, such as make zero, common percents, make one, working by parts, and halve/double

Make zero

$$\begin{aligned} &(-3) + (+7) \\ \text{think} \\ &= \underbrace{(-3) + (+3)}_0 + (+4) \\ &= 4 \end{aligned}$$

$$\begin{aligned} &(-3x) + (+7x) \\ \text{think} \\ &= \underbrace{(-3x) + (+3x)}_0 + (+4x) \\ &= 4x \end{aligned}$$

Common percents

$$\begin{aligned} 15\% \text{ of } \$70 \quad \text{think} \quad &10\% \text{ of } 70 + 5\% \text{ of } 70 \\ &= 7 + 3.5 \\ &= 10.5 \end{aligned}$$

Make one

$$\begin{aligned} &6.3 + 9.7 \\ \text{think} \\ &= 6 + 9 + \underbrace{0.3 + 0.7}_1 \\ &= 16 \end{aligned}$$

$$\begin{aligned} &3\frac{5}{8} + \frac{7}{8} \\ \text{think} \\ &= 3\frac{4}{8} + \left(\frac{1}{8} + \frac{7}{8}\right) \\ &= 3\frac{4}{8} + 1 \\ &= 4\frac{4}{8} \text{ or } 4\frac{1}{2} \end{aligned}$$

Working by parts

$$\begin{aligned} 3 \times \left(6\frac{1}{3}\right) \quad \text{think} \quad &(3 \times 6) + \left(3 \times \frac{1}{3}\right) \\ &= 18 + 1 \\ &= 19 \end{aligned}$$

Halve/double

$$\begin{aligned} &1\frac{1}{2} \times 12 \\ \text{think} \\ &\text{double } 1\frac{1}{2} \text{ and} \\ &\text{take half of } 12 \\ &3 \times 6 = 18 \end{aligned}$$

$$\begin{aligned} &5\% \text{ of } 3.2 \\ \text{think} \\ &\text{double } 5\% \text{ and} \\ &\text{take half of } 3.2 \\ &10\% \text{ of } 1.6 = 0.16 \end{aligned}$$

Estimation

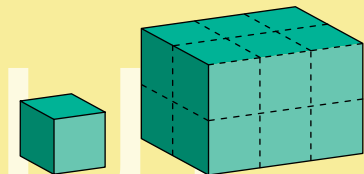
- leads to an approximate answer
- is a practical life skill
- requires the student to choose a reasonable number for a given situation
- encourages the use of various strategies when working with operations, data, and measurement, such as estimate an answer and measurement estimation

Estimate an answer

$$\begin{aligned} 0.72 \times 16 \quad \text{think} \quad &0.75 \times 16 \\ &= \frac{3}{4} \times 16 \\ &= 12 \end{aligned}$$

Measurement estimation

John was asked to estimate how many litres a container would hold. He knows that one large base-10 cube is equivalent to 1 litre. By placing the cube beside the container, he estimates the container will hold 12 litres.



let's talk about...