



THE 7 MATHEMATICAL PROCESSES

Mental Mathematics and Estimation [ME]

Mental mathematics

... is a combination of cognitive strategies that enhances flexible thinking and number sense. It involves using strategies to perform mental calculations. Mental mathematics enables students to determine answers without paper and pencil. It improves computational fluency by developing efficiency, accuracy and flexibility in reasoning and calculating.

Estimation is used for determining approximate values or quantities, usually by referring to benchmarks or referents, or for determining the reasonableness of calculated values.

Estimation is also used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. When estimating, students need to learn which strategy to use and how to use it.



It is critical that our students develop mental mathematics and estimation skills.



So what can we do to help?



In the classroom

... we can encourage students to develop strategies for mental mathematics and estimation in a variety of ways. Teachers should recognize that many students can compute mentally before they learn the relevant formal written algorithms at school. Teachers should learn about the strategies that students use and encourage the development of others. In the classroom, teachers can ensure that students are exposed to purposeful experiences with concrete objects and number patterns that support meaningful connections to the mathematics we ask students to learn. Teachers should model mental mathematics strategies for their students when performing calculations. Students need to know how to choose the most efficient strategy for them and how to apply that strategy to solve problems.





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20% off of \$78...
...wonder how much I will pay? Hmmmm...
10% of \$78.00 is about \$8.00
So, 20% means about \$16.00
So, 20% off means I should pay about
\$62.00 ... COOL!

Outside the classroom

... we can help students develop mental computation and estimation skills by encouraging students to talk about their strategies and offering opportunities to practice these strategies. For example, encourage them to estimate the cost of a purchase before they reach the cash register. Are there taxes to be calculated? Is there a discount to be applied? We can encourage students to use mental mathematics and estimation by asking questions such as,

- How did you calculate that?
- Is your answer reasonable? Is it even possible?
- Could you use another strategy to solve this problem?



We can help students learn to apply efficient mental mathematics and estimation strategies that benefit them beyond the walls of the classroom.