

Mental Math Strategies

Thinking Strategies for Addition

Counting On: Students start with a number and count on 1, 2, 3. For example, if the question is $5 + 2$, students count 5, 6, 7. Note: This strategy is only useful for adding 1, 2, or 3.

Using Doubles: The first fact combinations students often learn are doubles. Examples:
 $2 + 2 =$
 $3 + 3 =$
 $8 + 8 =$

Making Ten: Students make combinations that equal 10. Then they extend to make combinations that are multiples of 10. Examples: $6 + 4 = 10$ extends to $76 + 4 = 80$. This can then be extended to $10 + 4 = 14$ or $50 + 8 = 58$.

Thinking Strategies for Subtraction

Counting Back: Students start with a number and count backwards. If the question is $5 - 2$, students count 5, 4, 3. Note: This strategy is only useful for subtracting 1, 2, or 3.

Counting Up: Students start with a number being subtracted and count up to the number from which it is being subtracted. For example, for the question $9 - 7$, students can count 8, 9.

Using Part, Part, Whole:

Given: $\text{Part} + \text{Part} = \text{Whole}$
 Therefore: $\text{Whole} - \text{Part} = \text{Part}$
 Examples:

a. Thinking Addition:

$$15 - 8 = ?$$

$$\text{Whole} - \text{Part} = \text{Part} (?)$$

Students think $8 + 7 = 15$ (Part + Part = Whole)

$$\text{Therefore: } 15 - 8 = 7$$

b. Partitioning:

$$9 - 7 = ?$$

Numbers include 9, 7, 2.

Students make all possible combinations for $\text{Part} + \text{Part} = \text{Whole}$

$$7 + 2 = 9$$

$$2 + 7 = 9$$

$$\text{so } 9 - 2 = 7 \text{ or } 9 - 7 = 2$$

c. Missing Part:

$$8 + ? = 11$$

Students use part, part, whole to answer such questions.

When students have an easier time adding than subtracting the following strategies can be helpful.

Make Ten and Then Some:

Given a subtraction question such as $14 - 8 = ?$, students start with the part (8), add-on to make 10 (i.e., $8 + 2$), then add-on from 10 to make 14 ($10 + 4$). Then the students add the numbers they added-on to make 14 ($4 + 2 = 6$).

Using Doubles:

For the question $13 - 6 = ?$, students think addition using doubles. For example, $6 + 6 = 12$, then add-on 1 to make 13, so $6 + 1 = 7$.

Thinking in Patterns

Skip Counting:

Starting at any number, students skip count by 10s, 2s, 3s, 5s. For example, ask students to skip count by 10s starting at 46.

100 Chart:

Make sure a 100 chart is visible in your classroom and that students have access to desk-size charts. Refer to the chart and practise counting skills or the chart regularly.

Arrow Moves:

Indicate moves on the 100 chart by using arrows. For example, $23 + 11 = ?$, would be indicated with one space across from 23 to 24 and then from 24 ten spaces down to 34. Note the pattern for all additions of +11 on the chart. Extend to the addition or subtraction of other numbers.

Chaining Operations:

Example: $8 + 2 + 4 + 6 - 3 = ?$ (Note: choose combinations that end in multiples of 10 to encourage students' visualization of the 10 frame.)

Strategies for Adding and Subtracting Large Numbers:

Multiples of Ten:

For addition: $30 + 50 =$, $56 + 10 =$, $56 + 30 =$
For subtraction: $50 - 30 =$, $56 - 10 =$, $56 - 30 =$

Expanding the Second Addend or Subtrahend:

For addition: $28 + 17 =$, $28 + 10 + 7 =$
For subtraction: $28 - 17 =$, $28 - 10 - 7 =$

Front-end Adding:

Example: $65 + 26 = ?$ Ask students to think $60 + 20 = 80$ and $5 + 6 = 11$, so $80 + 11 = 91$.