Mental Math Strategies

http://www.plpsd.mb.ca/division/Rubrics/Mental%20Math%20Strategies.pdf

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.

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: Part + Part = Whole, Therefore: Whole – Part = Part

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.

Compensation for 8 and 9: Examples: 67 – 19 = 67 – 20 + 1
43 + 29 =43 + 30 – 1
67 – 18 = 67 – 20 + 2
43 + 28 = 43 + 30 – 2

Compatible Numbers: Students bring together numbers that add up to 10 or multiples of 10.

Example: 8 + 5 + 12 + 7 + 5 + 3 + 4 = ?
Think: 8 + 12 = 20, 5 + 5 = 10, 7 + 3 = 10
Therefore: 20 + 10 + 10 + 4 = 44

Multiples of 25: Students count by 25s and relate to money.

Common Zeros: For addition and subtraction operations, students remove the 0s, complete the operation, and then tack the 0 back on.

Example: 120 – 70 = ?
Think: 12 – 7 = 5
Add the common zero, so the answer is 50.

<u>Strategies for Multiplying</u>

Trailing Zeros: For multiplication, students remove the trailing 0s, multiply, and tack on all the removed zeros.

Examples: a. 5 x 60 = ?
Think: 5 x 6 = 30
Tack on the removed 0, so the answer is 300

b. 20 x 30 = ?
Think: 2 x 3 = 6
Then tack on all the removed 0s, so the answer is 600

Working with Known Facts: Work with multiplication facts that are more simple to use, then add or subtract the remaining group

Example: 15 x 6 = ?
Think: 15 x 5 = 75 + 15 = 90

Expanding the Numbers: Work according to place value for multiplication, then add up the products

Example: 25 x 14 = ?
Think: 20 x 10 = 200, 20 x 4 = 80, 5 x 10 = 50, and 5 x 4 = 20
Then Add: 200 + 80 + 50 + 20 = 350