**BLM 5–8.8: Mental Math Strategies**

The following list compiles mental math strategies as found in the *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes*. **Note:** This resource is meant for teacher information, not as a list of strategies that students should memorize.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Grade 1** | **Grade 2** | **Grade 3** | **Grade 4** | **Grade 5** | **Grade 6** | **Grade 7** |
| 1.N.10. | 2.N.8.  2.N.10. | 3.N.6.  3.N.7.  3.N.10.  3.N.11.  3.N.12. | 4.N.4.  4.N.5.  4.N.6.  4.N.11. | 5.N.2.  5.N.3.  5.N.4. | 6.N.8. | 7.N.2. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grade** | **Concept** | **Strategy** | **Meaning** | **Example** |
| 1 | Addition | Counting on | Students begin with a number and count on to get the sum. Students should begin to recognize that beginning with the larger of the two addends is generally most efficient. | *for* 3 + 5  *think* 5 + 1 + 1 + 1 *is* 8;  *think* 5, 6, 7, 8 |
| 1 | Subtraction | Counting back | Students begin with the minuend and count back to find the difference. | *for* 6 – 2  *think* 6 – 1 – 1 *is* 4;  *think* 6, 5, 4 |
| 1, 2 | Addition | Using one more | Starting from a known fact and adding one more. | *for* 8 + 5 *if you know*  8 + 4 *is* 12 *and one more is* 13 |
| 1, 2 | Addition | Using one less | Starting from a known fact and taking one away. | *for* 8 + 6 *if you know*  8 + 7 *is* 15 *and one less is* 14 |
| 1, 2, | Addition  Subtraction | Making 10 | Students use combinations that add up to ten and can extend this to multiples of ten in later grades. | 4 + \_\_\_\_ *is* 10  7 + \_\_\_\_ *is* 10;  *so* 23 + \_\_\_\_ *is* 30 |

**BLM 5–8.8: Mental Math Strategies (Continued)**

*(continued)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grade** | **Concept** | **Strategy** | **Meaning** | **Example** |
| 1 | Addition  Subtraction | Starting from known doubles | Students need to work to know their doubles facts. | 2 + 2 *is* 4  *and* 4 – 2 *is* 2 |
| 1, 2, 3 | Subtraction | Using addition to subtract | This is a form of part-part-whole representation. Thinking of addition as:  part + part = whole  Thinking of subtraction as:  whole – part = part | *for* 12 – 5  *think* 5 + \_\_\_\_ = 12  *so* 12 – 5 *is* 7 |
| 2 | Addition  Subtraction | The zero property of addition | Knowing that adding 0 to an addend does not change its value, and taking 0 from a minuend does not change the value. | 0 + 5 = 5;  11 – 0 = 11 |
| 2, 3 | Addition  Subtraction | Using doubles | Students learn doubles, and use this to extend facts:  using doubles  doubles plus one (or two)  doubles minus one (or two) | *for* 5 + 7  *think* 6 + 6 *is* 12;  *for* 5 + 7  *think* 5 + 5 + 2 *is* 12  *for* 5 + 7  *think* 7 + 7 – 2 *is* 12 |
| 2, 3 | Addition  Subtraction | Building on known doubles | Students learn doubles, and use this to extend facts. | *for* 7 + 8  *think* 7 + 7 *is* 14  *so* 7 + 8 *is* 14 + 1 *is* 15 |
| 3 | Addition | Adding from left to right | Using place value understanding to add  2-digit numerals. | *for* 25 + 33  *think* 20 + 30 *and* 5 + 3 *is* 50 + 8 *or* 58 |

**BLM 5–8.8: Mental Math Strategies (Continued)**

*(continued)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grade** | **Concept** | **Strategy** | **Meaning** | **Example** |
| 3 | Addition  Subtraction | Making 10 | Students use combinations that add up to ten to calculate other math facts and can extend this to multiples of ten in later grades. | *for* 8 + 5  *think* 8 + 2 + 3 *is*  10 + 3 *or* 13 |
| 3 | Addition  Subtraction | Compensation | Using other known math facts and compensating. For example, adding 2 to an addend and taking 2 away from the sum. | *for* 25 + 33  *think* 25 + 35 – 2 *is*  60 – 2 *or* 58 |
| 3 | Addition | Commutative property | Switching the order of the two numbers being added will not affect the sum. | 4 + 3 *is the same as*  3 + 4 |
| 3, 4 (decimals) | Addition  Subtraction | Compatible numbers | Compatible numbers are friendly numbers (often associated with compatible numbers to 5 or 10). | *for* 4 + 3 *students may think* 4 + 1 *is* 5 *and 2 more makes* 7 |
| 3 | Multiplication  Division | Array | Using an ordered arrangement to show multiplication or division (similar to area). | *for* 3 x 4 *think*  ••••  ••••  ••••  *for* 12  3 *think*  ••••  ••••  •••• |
| 3 | Multiplication | Commutative property | Switching the order of the two numbers being multiplied will not affect the product. | 4 x 5 *is the same as*  5 x 4 |
| 3 | Multiplication | Skip-counting | Using the concept of multiplication as a series of equal grouping to determine a product. | *for* 4 x 2  *think* 2, 4, 6, 8  *so* 4 x 2 *is* 8 |
| 4 | Multiplication | Zero property of multipli-cation | Multiplying a factor by zero will always result in zero. | 30 x 0 *is* 0  0 x 15 *is* 0 |

**BLM 5–8.8: Mental Math Strategies (Continued)**

*(continued)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grade** | **Concept** | **Strategy** | **Meaning** | **Example** |
| 4 | Multiplication  Division | Multiplicative identity | Multiplying (dividing) a factor (dividend) by one will not change its value. | 1 x 12 *is* 12  21  1 *is* 21 |
| 4. 5 | Multiplication  Division | Skip-counting from a known fact | Similar to the counting on strategy for addition. Using a known fact and skip counting forward or backward to determine the answer. | *for* 3 x 8  *think* 3 x 5 *is* 15 *and skip count by threes* 15, 18, 21, 24 |
| 4, 5 | Multiplication  Division | Doubling or halving | Using known facts and doubling or halving them to determine the answer. | *for* 7 x 4, *think the double of* 7 x 2 *is* 28  *for* 48  6, *think the double of* 24  6 *is* 8 |
| 4 | Multiplication  Division | Using the pattern for 9s | Knowing the first digit of the answer is one less than the non-nine factor and the sum of the product’s digits is nine. | *for* 7 x 9 *think one less than* 7 *is* 6 *and* 6 *plus* 3 *is nine, so* 7 x 9 *is* 63 |
| 4, 5 | Multiplication | Repeated doubling | Continually doubling to get to an answer. | *for* 3 x 8, *think* 3 x 2 *is* 6, 6 x 2 *is* 12, 12 x 2 *is* 24 |
| 4 | Division | Using multiplication to divide | This is a form of part-part-whole representation. Thinking of multiplication as:  part x part = whole  Thinking of division as:  whole  part = part | *for* 35  7  *think* 7 x \_\_\_\_ = 35  *so* 35  7 *is* 5 |
| 4, 5 | Multiplication | Distributive property | In arithmetic or algebra, when you distribute a factor across the brackets:  *a* x (*b* + *c*) = *a* x *b* + *a* x *c*  (*a* + *b*) x (*c* + *d*) = *ac* + *ad* + *bc* + *bd* | *for* 2 x 154  *think* 2 x 100 *plus* 2 x 50 *plus* 2 x 4 *is* 200 + 100 + 8 *or* 308 |

**BLM 5–8.8: Mental Math Strategies (Continued)**

*(continued)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grade** | **Concept** | **Strategy** | **Meaning** | **Example** |
| 5 | Division | Repeated halving | Continually halving to get a number. | *for* 32  4, *think* 32  2 *is* 16 *and* 16  2 *is* 8 *so* 32  4 *is* 8 |
| 5 | Multiplication | Annexing zeros | When multiplying by a factor of 10 (or a power of ten), taking off the zeros to determine the product and adding them back on. | *for* 4 x 700*, think* 4 x 7 *is* 28 *and add two zeros to make* 2800 |
| 5 | Multiplication | Halving and doubling | Halving one factor and doubling the other. | *for* 24 x 4, *think* 48 x 2 *is* 96 |
| 6, 7 | Division | Dividing by multiples of ten | When dividing by 10, 100, etc., the dividend becomes smaller by 1, 2, etc. place value positions. | *for* 76.3  10 *think* 76.3 *should become smaller by one place value position so* 76.3  10 *is* 7.63 |