**Operations and Algebraic Thinking**

**Enduring Understanding:** *Students possess an understanding of multiplication and division through modeling and manipulation of objects and apply these skills to solve problems.*

**1. Interprets products of whole numbers.**

*3.OA.1 Interpret products of whole numbers, e.g., interpret 5 x7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x7.*

*Grading Benchmark*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Unable to interpret products of whole numbers. | Requires teacher prompting and support to interpret products of whole numbers. | Independently interprets products of whole numbers.  | Independently selects multiple strategies to interpret whole numbers and are able to justify the strategies above and beyond grade level benchmarks. |
| 2nd  | Unable to interpret products of whole numbers. | Requires teacher prompting and support to interpret products of whole numbers. | Independently interprets products of whole numbers. | Independently selects multiple strategies to interpret whole numbers and are able to justify the strategies above and beyond grade level benchmarks. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**2. Interprets whole-number quotients of whole numbers.**

*3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Unable to interpret whole number quotients of whole numbers. | Requires teacher prompting and support to interpret whole number quotients. | Independently interprets whole number quotients using related multiplication facts.  | Selects multiple strategies to interpret and solve division. |
| 2nd  | Unable to interpret whole number quotients of whole numbers using related multiplication facts. | Requires teacher prompting and support to interpret whole number quotients using related multiplication facts. Needs teacher assistance to solve word problems in situations involving equal groups. | Independently interprets whole number quotients using related multiplication facts. Solve word problems in situations involving equal groups. Independently determines the unknown variable that makes an equation true. | Selects multiple strategies to create and solve division word problems using related multiplication facts and are able to justify their strategy. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**3. Use multiplication and division within 100 to solve word problems.**

*3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Unable to use multiplication within 100 to solve problems involving equal groups, arrays. | Requires teacher prompting and support to use multiplication within 100 to solve problems involving equal groups, arrays. | Independently uses multiplication within 100 to solve problems involving equal groups, arrays. | Selects multiple strategies to independently multiplication within 100 to solve problems involving equal groups, arrays. |
| 2nd  | Unable to use multiplication within 100 to solve problems involving equal groups, arrays. | Requires teacher prompting and support to use multiplication within 100 to solve problems involving equal groups, arrays. | Independently uses multiplication within 100 to solve problems involving equal groups, arrays. | Selects multiple strategies to independently multiplication within 100 to solve problems involving equal groups, arrays. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers.**

*3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × \_? = 48, 5 = 􀀀 \_÷ \_3, 6 × \_6 = ?.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Unable to determine the unknown whole number in a multiplication or division equation relating three whole numbers. Unable to recognize equations of different structures for both operations and is unable to apply knowledge of fact families to include inverse. | Requires teacher prompting and support to determine the unknown whole number in a multiplication or division equation relating three whole numbers. Difficulty recognizing equations of different structures for both operations and has difficulty applying knowledge of fact families to include inverse relationships of multiplication and division. | Independently determines the unknown whole number in a multiplication or division equation relating three whole numbers. Recognizes equations of different structures for both operations and applies knowledge of fact families to include inverse relationships of multiplication and division. | Independently determines the unknown whole number in a multiplication or division equation relating three whole numbers. Recognizes equations of different structures for both operations and applies knowledge of fact families to include inverse relationships of multiplication and division. Is able to explain and critique other’s reasoning above and beyond grade level benchmarks. |
| 2nd  | Unable to determine the unknown whole number in a multiplication or division equation relating three whole numbers. Unable to recognize equations of different structures for both operations and is unable to apply knowledge of fact families to include inverse. | Requires teacher prompting and support to determine the unknown whole number in a multiplication or division equation relating three whole numbers. Difficulty recognizing equations of different structures for both operations and has difficulty applying knowledge of fact families to include inverse relationships of multiplication and division. | Independently determines the unknown whole number in a multiplication or division equation relating three whole numbers. Recognizes equations of different structures for both operations and applies knowledge of fact families to include inverse relationships of multiplication and division. | Independently determines the unknown whole number in a multiplication or division equation relating three whole numbers. Recognizes equations of different structures for both operations and applies knowledge of fact families to include inverse relationships of multiplication and division. Is able to explain and critique other’s reasoning above and beyond grade level benchmarks. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**5. Apply properties of operations as strategies to multiply and divide.**

*3.OA.5 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Unable to demonstrate an understanding of the properties of multiplication and division and the relationship between multiplying and dividing. | Requires teacher prompting and support to demonstrate an understanding of the properties of multiplication and division and the relationship between multiplying and dividing. | Independently applies the properties of operations as strategies of multiplication.  | Uses the properties of Multiplication as a strategy to solve problems and justify their strategy. |
| 2nd  | Unable to apply properties of operations as strategies to multiply all multiples through 100. | Requires teacher prompting and support to apply properties of operations as strategies to multiply. Uses tactile aids or arrays to multiply al multiples through 100. | Independently applies the properties of operations as strategies of multiplication. Uses the Commutative, Associative and Distributive properties of multiplication to solve problems.  | Uses the properties of Multiplication as a strategy to solve problems and justify their strategy. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**6. Understands division as an unknown-factor problem.**

*3.OA.6 Understand division as an unknown-factor problem. For example, find 32÷8 by finding the number that makes 32 when multiplied by 8.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st |  |  |  |  |
| 2nd  |  |  |  |  |
| 3rd |  |  |  |  |

**7. Fluently multiplies within 100.**

*3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × \_5 = 40, one knows 40 ÷ \_5 = 8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Unable to recall multiplication facts in a timely manner. | Requires teacher prompting and support, as well as tactile aids to recall multiplication facts in a timely manner. | Independently able to recall basic multiplication facts (within 100) from memory, in a timely manner. | Independently able to recall basic multiplication facts (within 100) from memory, in a timely manner. Is able to explain and critique others reasoning above and beyond grade level benchmarks. |
| 2nd | Unable to recall multiplication facts in a timely manner. | Requires teacher prompting and support, as well as tactile aids to recall multiplication facts in a timely manner. | Independently able to recall basic multiplication facts (within 100) from memory, in a timely manner. | Independently able to recall basic multiplication facts (within 100) from memory, in a timely manner. Is able to explain and critique others reasoning above and beyond grade level benchmarks. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**8. Fluently division within 100.**

*3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × \_5 = 40, one knows 40 ÷ \_5 = 8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Unable to recall division facts in a timely manner. | Requires teacher prompting and support, as well as tactile aids to recall division facts in a timely manner. | Independently able to recall basic division facts (within 100) from memory, in a timely manner. | Independently able to recall basic division facts (within 100) from memory, in a timely manner. Is able to explain and critique others reasoning above and beyond grade level benchmarks. |
| 2nd | Unable to recall division facts in a timely manner. | Requires teacher prompting and support, as well as tactile aids to recall division facts in a timely manner. | Independently able to recall basic division facts (within 100) from memory, in a timely manner. | Independently able to recall basic division facts (within 100) from memory, in a timely manner. Is able to explain and critique others reasoning above and beyond grade level benchmarks. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**9. Solves two-step word problems involving the four operations ( +, -, x,÷)**

*3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Unable to solve two-step word problems using the four operations. Unable to represent these problems using equations with a letter standing for the unknown quantity. Unable to assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Requires teacher prompting and support to solve two- step word problems using the four operations.Needs teacher assistance to represent these problems using equations with a letter standing for the unknown quantity. Needs teacher help and prompts to assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Independently solves two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assesses the reasonableness of answers using mental computation and estimation strategies including rounding. | Independently solves multi-step word problems using the four operations. Independently represents these problems using equations with a letter standing for the unknown quantity. Uses multiple strategies to assess the reasonableness of answers using mental computation and multiple estimation strategies above and beyond grade level benchmarks. |
| 2nd | Unable to solve two-step word problems using the four operations. Unable to represent these problems using equations with a letter standing for the unknown quantity. Unable to assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Requires teacher prompting and support to solve two- step word problems using the four operations.Needs teacher assistance to represent these problems using equations with a letter standing for the unknown quantity. Needs teacher help and prompts to assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Independently solves two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assesses the reasonableness of answers using mental computation and estimation strategies including rounding. | Independently solves multi-step word problems using the four operations. Independently represents these problems using equations with a letter standing for the unknown quantity. Uses multiple strategies to assess the reasonableness of answers using mental computation and multiple estimation strategies above and beyond grade level benchmarks. |
| 3rd | Unable to solve two-step word problems using the four operations. Unable to represent these problems using equations with a letter standing for the unknown quantity. Unable to assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Requires teacher prompting and support to solve two- step word problems using the four operations.Needs teacher assistance to represent these problems using equations with a letter standing for the unknown quantity. Needs teacher help and prompts to assess the reasonableness of answers using mental computation and estimation strategies including rounding. | Independently solves two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assesses the reasonableness of answers using mental computation and estimation strategies including rounding. | Independently solves multi-step word problems using the four operations. Independently represents these problems using equations with a letter standing for the unknown quantity. Uses multiple strategies to assess the reasonableness of answers using mental computation and multiple estimation strategies above and beyond grade level benchmarks. |

**10. Identify arithmetic patterns and explain them using properties of operations.**

*3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Not assessed at this time | Not assessed at this time | Not assessed at this time | Not assessed at this time |
| 2nd | Not assessed at this time | Not assessed at this time | Not assessed at this time | Not assessed at this time |
| 3rd | Unable to identify patterns in the multiplication table and explain them using properties of operations. Unable to identify patterns with multiples. | Requires teacher prompting and support to identify patterns in the multiplication table and explain them using properties of operations. Needs teacher support to identify patterns with multiples. | Independently identifies patterns in the multiplication table and explain them using properties of operations. Identifies patterns with multiples. | Independently extends multiplication and division patterns and applies them to solve word problems. Explains reasoning through a table or chart, and is able to construct viable arguments to justify and communicate reasoning above and beyond grade level benchmarks. |

**NUMBER & OPERATIONS IN BASE TEN**

**Enduring Understanding:** Students will understand and explain what numbers mean, how they may be represented, and what relationships exist among them to accurately and efficiently perform computations.

**1. Use place value understanding to round whole numbers to the nearest 10 or 100.**

*3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100****.***

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 2nd | Unable to round whole numbers to the nearest ten and hundred. | Requires teacher prompting and support to round whole numbers to the nearest ten and hundred. | Independently uses place value understanding to round whole numbers to the nearest ten and hundred. Independently uses rounding to estimate and determines if an estimate is reasonable. | Independently uses place-value understanding to assess the reasonableness of answers in word problems using estimation strategies including rounding, and is able to construct viable arguments to explain answers and critique the reasoning of others. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**2. Rounds numbers to the nearest 10, 100**

*3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 2nd | Unable to add and subtract within 1000 in a timely manner. | Requires teacher prompting and support as well as tactile aids to add and subtract within 1000 in a timely manner. | Consistently and independently adds and subtracts within 1000 (in a timely manner), using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. | Consistently and independently adds and subtracts within1000 (in a timely manner), using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. Is able to explain answers and critique the reasoning of others above and beyond grade level benchmarks. |
| 3rd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |

**3. Multiplies 1 digit numbers by multiples of 10.**

*3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 2nd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 3rd | Unable to multiply 1 digit numbers by multiples of 10. | Requires teacher prompting and support as well as manipulatives to multiply 1 digit numbers by multiples of 10 using place value and/or properties of operation. | Independently multiplies 1 digit number by multiples of 10 using place value and/or properties of operation. | Integrates 1 or more strategies in tandem based upon place value and properties of operations to multiply 1 digit numbers by any 2 digit number and can justify the choice of strategy (ies) about the product. |

**NUMBER & OPERATIONS - FRACTIONS**

**Enduring Understanding:** Students understand what fractions mean, how they maybe represented and what relationships exist among them.

**1. Understands a fraction as part of a whole.**

*3.NF.1 Understand a fraction* ***1/b*** *as the quantity formed by 1 part when a whole is partitioned into* ***b*** *equal parts; understand a fraction* ***a/b*** *as the quantity formed by* ***a*** *parts of size* ***1/b.***

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 2nd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 3rd | Unable to understand a fraction as the quality formed by 1 part when a whole is partitioned into equal parts.  | Requires teacher understand a fraction as the quality formed by 1 part when a whole is partitioned into equal parts.  | Independently understands a fraction as the quality formed by 1 part when a whole is partitioned into equal parts.  | Independently applies and extends knowledge of fractions to other areas of mathematics and/or justify the relationship between fractions without aid of visual models.  |

**2. Understands fractions as a number on a number line.**

*3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.*

*a. Represent a fraction* ***1****/****b*** *on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size* ***1****/****b*** *and that the endpoint of the part based at 0 locates the number* ***1****/****b*** *on the number line.*

*b. Represent a fraction* ***a****/****b*** *on a number line diagram by marking off a lengths* ***1****/****b*** *from 0. Recognize that the resulting interval has size* ***a****/****b*** *and that its endpoint locates the number* ***a****/****b*** *on the number line.****.***

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 2nd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 3rd | Unable to Independently represents fractions on a number line diagram by marking off equal intervals of **1/b** starting at “0” to its endpoint locating the fraction **a/b**. | Requires teacher prompting and support to represent fractions on a number line diagram by marking off equal intervals of **1/b** starting at “0” to its endpoint locating the fraction **a/b**. | Consistently and independently represents fractions on a number line diagram by marking off equal intervals of **1/b** starting at “0” to its endpoint locating the fraction **a/b**. | Consistently and independently applies and extends the understanding of a fraction as a number on the number line diagram beyond the whole number **1** or **b/b** above and beyond grade level benchmarks. |

**3. Explains and compares equivalent fractions.**

*3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.*

*a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.*

*b. Recognize and generate simple equivalent fractions, e.g.,* ***1****/****2*** *=* ***2****/****4****,* ***4****/****6*** *=* ***2****/****3****. Explain why the fractions are equivalent, e.g., by using a visual fraction model.*

*c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 =* ***3****/****1****; recognize that* ***6****/****1*** *= 6; locate* ***4****/****4*** *and 1 at the same point of a number line diagram.*

*d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.*

*Grading Benchmarks*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trimester | 1 | 2 | 3 | 4 |
| 1st | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 2nd | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester | Not assessed in this trimester |
| 3rd | Unable to compare fractions with the same numerator or denominator to determine their equivalence, record the comparisons using <, =, or > symbols, and justify the relationships by using visual models. | Requires teacher prompting and support to compare fractions with the same numerator or denominator to determine their equivalence, record the comparisons using <, =, or > symbols, and justify the relationships by using visual models. | Independently compares fractions with the same numerator or denominator to determine their equivalence, record the comparisons using <, =, or > symbols, and justify the relationships by using visual models. | Independently applies knowledge of fractions with the same numerator or denominator to determine their equivalence, record the comparisons using <, =, or > symbols, solve problems and justify the relationships by using visual models. |