### Critical Area 1: Developing understanding of multiplication and division and strategies for multiplication and division within 100.

Domains: Number & Operations in Base Ten, Operations & Algebraic Thinking, Number & Operation-Fractions

<table>
<thead>
<tr>
<th>Meaning</th>
<th>Essential Question(Q)</th>
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</thead>
<tbody>
<tr>
<td>Understandings (U) Students will understand...</td>
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<tr>
<td>- Place value language as they describe the procedures for adding multi digit numbers.</td>
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<tr>
<td>- The value of the entire number rather than the value of particular digits (for example 67: 6 and 7 are the digits. The value of the number is obtained by multiplying 6 by 10 as it is in the tens place and 7 by 1 as it is in the ones place and then adding them together 60+7 to get 67.</td>
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<tr>
<td>- The meaning of multiplication- repeated addition and area.</td>
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<tr>
<td>- Models are useful in making sense of multiplication.</td>
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<tr>
<td>- The Associative and Distributive properties to build understanding of multiplication.</td>
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<tr>
<td>- Patterns through multiplication strategies.</td>
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<tr>
<td>- The connection between addition and multiplication.</td>
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<tr>
<td>- The use of groups and arrays to model multiplication and division.</td>
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<tr>
<td>- The connections between multiplication and division with arrays.</td>
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<table>
<thead>
<tr>
<th>Students will keep considering...</th>
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<tbody>
<tr>
<td>1. How do you identify patterns to see relationships within the four operations?</td>
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<tr>
<td>2. How does understanding the properties (commutative, associative, distributive, identity) extend our understanding of the relationships between numbers?</td>
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<tr>
<td>3. How is the distributive property used to explain 3 X 11 and 3 X 12?</td>
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<tr>
<td>4. How can using models help you solve a problem using all four operations?</td>
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<tbody>
<tr>
<td>Students will know (Knowledge)</td>
</tr>
<tr>
<td>- Solve problems involving the four operations, and identify and explain patterns in arithmetic. (3.OA.8; 3.OA.9)</td>
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<tr>
<td>- Use place value understanding and properties of operations to perform multi-digit arithmetic. (3.NBT.1; 3.NBT.3)</td>
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<tr>
<td>- Represent and solve problems involving multiplication and division. (3.OA.1; 3.OA.2; 3.OA.3; 3.OA.4)</td>
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<tr>
<td>- Understand properties of multiplication and the relationship between multiplication and division. (3.OA.5; 3.OA.6)</td>
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<tr>
<td>- Multiply and divide within 100. (3.OA.7)</td>
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<tr>
<th>Students will be skilled and be able to (Demonstrate)</th>
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<tbody>
<tr>
<td>- Models (arrays, equal groups, diagrams, bar model) to solve problems.</td>
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<tr>
<td>- Use a number line to skip count.</td>
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<tr>
<td>- Use multiple strategies/properties to solve all four operations.</td>
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<tr>
<td>- Use base-ten blocks or place value to multiply with multiples of ten.</td>
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</table>
### Critical Area 2: Developing understanding of fractions, especially unit fractions

(fractions with a numerator of 1)

Domains: Numbers and operations - Fractions

| Meaning |
|-----------------|-----------------|
| **Understandings (U)** | **Essential Question (Q)** |

Students will understand that fractions can be

- Part of a whole
- Part of a set
- Represented by an area model
- Represented on a number line

In understanding a fraction as parts of a whole

- The denominator of a fraction names the number of equal parts in a whole.
- The numerator names how many of the parts are being considered.
- Different strategies to compare fractions with the same numerator or same denominator. (which is greater \( \frac{1}{2} \) or \( \frac{1}{3} \) or which is greater \( \frac{4}{5} \) or \( \frac{3}{5} \))
- Dividing equal pieces into the same number of equal parts will result in equivalent fractions.

\[
\frac{1}{2} = \frac{2}{4} = \frac{3}{6}
\]

Students will keep considering...

1. How do you represent a fraction as parts of a whole?
2. How do you represent a fraction as part of a set?
3. How do you show a fraction on a number line?
4. What strategies do you use to rank fractions in order of magnitude?
5. How can you show equivalent fractions given a fraction?
## Acquisition

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<th>Students will be skilled and be able to (Demonstrate)</th>
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<tbody>
<tr>
<td>- Understand fractions as numbers. (3.NF1; 3.NF.2; 3.NF.3)</td>
<td>- Represent fractions on a number line.</td>
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<tr>
<td></td>
<td>- Express whole numbers as fractions.</td>
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<tr>
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<td>- Use models to represent fractions.</td>
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<td>- Use multiple strategies to compare fractions.</td>
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## Critical Area 3: Developing the understanding of the structure of rectangular arrays and of area.

Developing an understanding of representing and interpreting data. Describing and analyzing two-dimensional shapes.

Domains: Measurement, Data and Geometry

## Meaning

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<td>Students will understand...</td>
<td>Students will keep considering...</td>
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<tr>
<td>- Units fill a space.</td>
<td>1. How can you tell time and use measurement to describe the size of an object?</td>
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<tr>
<td>- Units can be partitions (one inch can be divided into two half inches.)</td>
<td>2. How drawing a picture helps you to solve problems involving area and perimeter?</td>
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<tr>
<td>- Any point can serve as the origin on a scale.</td>
<td>3. How can you represent and interpret data?</td>
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<tr>
<td>- The choice of units in relation to the object being measured determines the accuracy of the measure.</td>
<td>4. How can you describe and classify two-dimensional shapes?</td>
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<tr>
<td>- Area is the amount of space taken up by a two-dimensional object or shape.</td>
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<tr>
<td>- Perimeter is the distance or length around a two-dimensional shape.</td>
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<tr>
<td>- Once the area of a rectangle is established it can be used to construct the formula for other polygons.</td>
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<tr>
<td>- Using quantifiers, such as all, some, or none, and varying drawings helps focus on the attributes of shapes.</td>
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<tr>
<td>- That bar graphs, picture graphs and line plots can be used to organize record and compare data.</td>
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## Acquisition

**Students will know (Knowledge)**

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (3.MD.1; 3.MD.2)
- Represent and interpret data. (3.MD.4)
- Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. (3.MD.8)
- Understand concepts of area and relate area to multiplication and addition. (3.MD.5; 3.MD.6; 3MD.7)
- Represent and interpret data. (3.MD.3; 3.MD.4)
- Reason with shapes and their attributes. (3.G.1; 3.G.2)

**Students will be skilled and be able to (Demonstrate)**

- Read, write and tell time to the nearest minute on a digital and analog clock.
- Use a number line to measure, add or subtract time intervals.
- Use multiple strategies to determine time intervals.
- Measure length to nearest \( \frac{1}{2} \) or \( \frac{1}{4} \) inch.
- Estimate and measure liquid volume and measure mass.
- Use multiple strategies to measure and determine perimeter.
- Use multiple strategies to measure and determine area
- Organize and use data from multiple graphs.
- Describe and draw attributes of plane shapes.
- Describe relationships of lines.

## Standard for Mathematical Practice (SMP)

**MP.1** Make sense of problems and persevere in solving them.

**MP.2** Reason abstractly and quantitatively.

**MP.3** Construct viable arguments and critique the reasoning of others.

**MP.4** Model with mathematics.

**MP.5** Use appropriate tools strategically.

**MP.6** Attend to precision.

**MP.7** Look for and make use of structure.

**MP.8** Look for and express regularity in repeated reasoning.