The topics described in the Standards for Mathematical Content will vary from year to year. However, the way in which you learn, study, and think about mathematics will not. The Standards for Mathematical Practice describe skills that you will use in all of your math courses. These pages show some features of your book that will help you gain these skills and use them to master this year’s topics.

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

Mathematically proficient students start by explaining to themselves the meaning of a problem… They analyze givens, constraints, relationships, and goals. They make conjectures about the form… of the solution and plan a solution pathway…

**Problem-solving examples and exercises** lead students through problem-solving steps.

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

Mathematically proficient students… bring two complementary abilities to bear on problems…. the ability to decontextualize—to abstract a given situation and represent it symbolically…and the ability to contextualize, to pause…in order to probe into the referents for the symbols involved.

**Focus on Higher Order Thinking exercises** in every lesson and a **Project** in every unit require you to use logical reasoning, represent situations symbolically, use mathematical models to solve problems, and state your answers in terms of a problem context.
**MP.3** Construct viable arguments and critique the reasoning of others.

Mathematically proficient students... justify their conclusions, [and]... distinguish correct... reasoning from that which is flawed.

**Reflect**

1. **Critique Reasoning** Jo says she can find the percent equivalent of multiplying the percent equivalent of \( \frac{1}{4} \) by 3. How can you use a bar model to support this claim?

**ESSENTIAL QUESTION CHECK-IN**

Essential Question Check-in and Reflect in every lesson ask you to evaluate statements, explain relationships, apply mathematical principles, make conjectures, construct arguments, and justify your reasoning.

**MP.4** Model with mathematics.

Mathematically proficient students can apply... mathematics... to... problems... in everyday life, society, and the workplace.

**EXAMPLE 2** Real World

You make \( \frac{5}{4} \) cups of punch by mixing \( \frac{3}{2} \) cups of cranberry juice with \( \frac{2}{3} \) cups of apple juice. How much cranberry juice and how much apple juice do you need to make four times the original recipe?

**Method 1** Use a table

**STEP 1** Make a table comparing the numbers of cups of cranberry juice and apple juice needed to make two times, three times, four times, and five times the original recipe.

<table>
<thead>
<tr>
<th></th>
<th>3 x 2</th>
<th>3 x 3</th>
<th>3 x 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranberry Juice</td>
<td>6</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Apple Juice</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

Multiply each term of the original ratio by the same number to find an equivalent ratio.

Real-world examples and mathematical modeling apply mathematics to other disciplines and real-world contexts such as science and business.

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

Mathematically proficient students consider the available tools when solving a... problem... [and] are... able to use technological tools to explore and deepen their understanding...

**EXPLORE ACTIVITY**

**Modeling Mixed Number Division**

Antoine is making sushi rolls. He has \( 2 \frac{1}{2} \) cups of rice and will use \( \frac{1}{4} \) cup of rice for each sushi roll. How many sushi rolls can he make?

1. **To find the number of sushi rolls that can be made, you need to determine how many fourths are in \( 2 \frac{1}{2} \). Use fraction pieces to represent \( 2 \frac{1}{2} \) on the model below.**

   \[ \frac{1}{4} \quad \frac{1}{4} \quad \frac{1}{4} \quad \frac{1}{4} \]

   How many fourths are in \( 2 \frac{1}{2} \)?

   Antoine has enough rice to make _____ sushi rolls.

**Reflect**

1. **Communicate Mathematical Ideas.** Which mathematical operation...
**MP.6  Attend to precision.**

Mathematically proficient students… communicate precisely… with others and in their own reasoning… [They] give carefully formulated explanations…

**31. Communicate Mathematical Ideas** Write an example of an expression that cannot be simplified, and explain how you know that it cannot be simplified.

**Key Vocabulary**

**rate (tasa)**
A ratio that compares two quantities measured in different units.

Precision refers not only to the correctness of calculations but also to the proper use of mathematical language and symbols. **Communicate Mathematical Ideas** exercises and **Key Vocabulary** highlighted for each module and unit help you learn and use the language of math to communicate mathematics precisely.

---

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

Mathematically proficient students… look closely to discern a pattern or structure… They can also step back for an overview and shift perspectives.

Throughout the lessons, you will observe regularity in mathematical structures in order to make generalizations and make connections between related problems. For example, you can use what you known about multiplication to understand how to use exponents.

---

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

Mathematically proficient students… look both for general methods and for shortcuts… [and] maintain oversight of the process, while attending to the details.

**46. Look for a Pattern** Find the values of the powers in the following pattern: $10^1, 10^2, 10^3, 10^4, \ldots$ Describe the pattern, and use it to write $10^6$ without using multiplication.

**25. Justify Reasoning** Determine whether $3x + 12 + x$ is equivalent to $4(3 + x)$. Use properties of operations to justify your answer.

**Reflect**

**8. Make a Conjecture** Use the pattern in the table to make a conjecture about how you can use multiplication to divide one fraction by another.

You will look for repeated calculations and mathematical patterns in examples and exercises. Recognizing patterns can help you make generalizations and obtain a better understanding of the underlying mathematics.