# Unit 11 Reveal Grade 4

Content Area: **Math**
Course(s): **Math**
Time Period: **April**
Length: **2 weeks**
Status: **Published**

## Unit Overview

UNIT 11 PLANNER

### Multiply Fractions by Whole Numbers

PACING: 9 days

| LESSON | MATH OBJECTIVE | LANGUAGE OBJECTIVE | SOCIAL AND EMOTIONAL LEARNING OBJECTIVE | LESSON | KEY VOCABULARY |
|---|---|---|---|---|---|
| Unit Opener IGNITE! Fraction Patterns | | | | | |
| 11-1 Represent Multiplication of a Unit Fraction by a Whole Number | Students apply their understanding of fractions and multiplication to multiply a unit fraction by a whole number. Students use fraction models to represent a fraction as a multiple of a unit fraction. | Students discuss representations to multiply unit fractions and whole numbers using correct present and past tense verbs. | Students engage in active listening and work collaboratively with a partner to complete mathematical tasks. | 11-1 | Math Terms<br>denominator<br>multiple<br>numerator<br>unit fraction |
| 11-2 Understand Multiplying a Fraction by a Whole Number | Students multiply a fraction by a whole number using visual fraction models. Students write multiples of fractions as multiples of a unit fraction. | Students discuss using representations to multiply fractions by whole numbers using correct subject and verb agreement. | Students break down a situation to identify the problem at hand. | 11-2 | equal groups<br>multiple<br>unit fraction |
| 11-3 Multiply a Fraction by a Whole Number | Students use their understanding of fractions as multiples of unit fractions to multiply a fraction by a whole number. | Students explain multiplying a fraction by a whole number by expressing the fractions as a multiple of a unit fraction using complete sentences. | Students explore taking different perspectives on approaches to problem solving. | 11-3 | Associative Property of Multiplication<br>multiple |
| 11-4 Multiply a Mixed Number by a Whole Number | Students multiply mixed numbers by whole numbers by using strategies, such as equivalent fractions and decomposing the mixed number into whole number and fractional parts. | Students articulate multiplying mixed numbers by whole numbers problems using *can* and *should*. | Students demonstrate self-awareness of personal strengths and areas of challenge in mathematics. | 11-4 | Distributive Property of Multiplication<br>mixed number |
| Math Probe Which is Greater? Gather data on students' understandings of multiplying fractions by whole numbers. | | | | | |
| 11-5 Solve Problems Involving Fractions and Mixed Numbers | Students represent and solve word problems involving multiplying fractions by whole numbers with visual fraction models and multiplication equations. | Students discuss multiplication of fractions and mixed numbers by whole numbers using sequence words *first* and *then*. | Students set learning goals and initiate work on tasks to accomplish their goals. | 11-5 | fraction<br>multiple<br>unit fraction |
| Unit Review<br>Fluency Practice | | | | | |
| Unit Assessment<br>Performance Task | | | | | |



## Enduring Understandings

See Above

## Essential Questions

See Above

## Instructional Strategies and Learning Activities

LESSON 11-1

# Represent Multiplication of a Unit Fraction by a Whole Number

### Learning Targets

- I can multiply a unit fraction by a whole number the same way I multiply whole numbers.
- I can represent a fraction as a multiple of a unit fraction.

### Standards ◆ Major ▲ Supporting ● Additional

**Content**

◇ **4.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

◇ **4.NF.B.4.a** Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. *For example, use a visual fraction model to represent* $\frac{5}{4}$ *as the product* $5 \times \frac{1}{4}$*, recording the conclusion by the equation* $\frac{5}{4} = 5 \times \left(\frac{1}{4}\right)$.

**Math Practices and Processes**

**MPP** Reason abstractly and quantitatively.

### Focus

| Content Objectives | Language Objectives | SEL Objective |
|---|---|---|
| • Students apply their understanding of fractions and multiplication to multiply a unit fraction by a whole number.<br>• Students use fraction models to represent a fraction as a multiple of a unit fraction. | • Students discuss representations to multiply unit fractions and whole numbers using correct present and past tense verbs.<br>• To maximize meta-awareness, ELs participate in MLR7: Compare and Connect. | • Students engage in active listening and work collaboratively with a partner to complete mathematical tasks. |

### Coherence

| Previous | Now | Next |
|---|---|---|
| • Students represented unit fractions using various representations (Grade 3).<br>• Students added fractions with like denominators (Unit 9). | • Students use representations to multiply unit fractions and whole numbers, and represent a fraction as a multiple of a unit fraction. | • Students multiply a fraction by a whole number (Unit 11).<br>• Students multiply a fraction or whole number by a fraction (Grade 5). |

### Rigor

| Conceptual Understanding | Procedural Skill & Fluency | Application |
|---|---|---|
| • Students extend their understanding of multiplication and fractions as they use representations to multiply unit fractions by whole numbers. | • Students build proficiency in multiplying unit fractions by whole numbers. | • Students apply their understanding of multiplying unit fractions by whole numbers to solve word problems.<br>*Application is not a targeted element of rigor for this standard.* |

LESSON 11-2

# Understand Multiplying a Fraction by a Whole Number

## Learning Targets

- I can multiply a fraction by a whole number using visual fraction models.
- I can write a multiple of a fraction as a multiple of a unit fraction.

## Standards ◆ Major ▲ Supporting ● Additional

**Content**

◇ **4.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

◇ **4.NF.B.4.b** Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express* $3 \times \left(\frac{2}{5}\right)$ *as* $6 \times \left(\frac{1}{5}\right)$, *recognizing this product as* $\frac{6}{5}$. $\left(\text{In general, } n \times \left(\frac{a}{b}\right) = \frac{(n \times a)}{b}\right)$

◇ **4.NF.B.4.c** Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat* $\frac{3}{8}$ *of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

**Math Practices and Processes**

**MPP** Reason abstractly and quantitatively.

## Focus

| Content Objectives | Language Objectives | SEL Objective |
|---|---|---|
| • Students multiply a fraction by a whole number by using visual fraction models.<br>• Students write multiples of fractions as multiples of unit fractions. | • Students discuss using representations to multiply fractions by whole numbers using correct subject and verb agreement.<br>• To support sense-making, ELs participate in MLR2: Collect and Display. | • Students break down a situation to identify the problem at hand. |

## Coherence

| Previous | Now | Next |
|---|---|---|
| • Students used fraction models to represent fractions (Grade 3).<br>• Students used representations to multiply unit fractions by whole numbers (Unit 11). | • Students use representations to multiply fractions by whole numbers.<br>• Students write multiples of fractions as multiples of unit fractions. | • Students multiply a mixed number by a whole number (Unit 11).<br>• Students multiply a fraction by a fraction (Grade 5). |

## Rigor

| Conceptual Understanding | Procedural Skill & Fluency | Application |
|---|---|---|
| • Students develop understanding of multiplying a fraction by a whole number using representations and equations. | • Students build fluency with multiplying a fraction by a whole number. | • Students apply their understanding of multiplying a fraction by a whole number to solve real world word problems. |

LESSON 11-3

# Multiply a Fraction by a Whole Number

## Learning Target

- I can multiply a fraction by a whole number by representing the fraction as a multiple of a unit fraction.

## Standards ◆ Major ▲ Supporting ● Additional

**Content**

◇ **4.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

◇ **4.NF.B.4.a** Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. *For example, use a visual fraction model to represent* $\frac{5}{4}$ *as the product* $5 \times \left(\frac{1}{4}\right)$*, recording the conclusion by the equation* $\frac{5}{4} = 5 \times \left(\frac{1}{4}\right)$.

◇ **4.NF.B.4.b** Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express* $3 \times \left(\frac{2}{5}\right)$ *as* $6 \times \left(\frac{1}{5}\right)$*, recognizing this product as* $\frac{6}{5}$. $\left(\text{In general, } n \times \left(\frac{a}{b}\right) = \frac{(n \times a)}{b}.\right)$

**Math Practices and Processes**

**MPP** Model with mathematics.

**MPP** Look for and express regularity in repeated reasoning.

## Focus

| Content Objective | Language Objectives | SEL Objective |
|---|---|---|
| • Students use their understanding of fractions as multiples of unit fractions to multiply a fraction by a whole number. | • Students explain multiplying a fraction by a whole number by expressing the fractions as a multiple of a unit fraction using complete sentences.<br>• To optimize output, ELs participate in MLR4: Information Gap. | • Students explore taking different perspectives on approaches to problem solving. |

## Coherence

| Previous | Now | Next |
|---|---|---|
| • Students used fraction models to represent problems (Grade 3).<br>• Students used representations to multiply fractions by whole numbers (Unit 11). | • Students multiply a fraction by a whole number by expressing the fractions as a multiple of a unit fraction. | • Students multiply a mixed number by a whole number (Unit 11).<br>• Students multiply a fraction by a fraction (Grade 5). |

## Rigor

| Conceptual Understanding | Procedural Skill & Fluency | Application |
|---|---|---|
| • Students extend their understanding of multiplying a fraction by a whole number by representing the fraction as a multiple of a unit fraction. | • Students build fluency with multiplying a fraction by a whole number. | • Students apply their understanding of multiplying a fraction by a whole number to solve real- world word problems.<br>*Application is not a targeted element of rigor for this standard.* |

LESSON 11-4

# Multiply a Mixed Number by a Whole Number

## Learning Target

- I can multiply mixed numbers by whole numbers using visual fraction models and equations.

## Standards ◇ Major △ Supporting ○ Additional

**Content**

◇ **4.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

◇ **4.NF.B.4.a** Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. *For example, use a visual fraction model to represent* $\frac{5}{4}$ *as the product* $5 \times \left(\frac{1}{4}\right)$*, recording the conclusion by the equation* $\frac{5}{4} = 5 \times \left(\frac{1}{4}\right)$.

◇ **4.NF.B.4.b** Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express* $3 \times \left(\frac{2}{5}\right)$ *as* $6 \times \left(\frac{1}{5}\right)$*, recognizing this product as* $\frac{6}{5}$. $\left(\text{In general, } n \times \left(\frac{a}{b}\right) = \frac{(n \times a)}{b}\right)$

**Math Practices and Processes**

**MPP** Reason abstractly and quantitatively.

## Focus

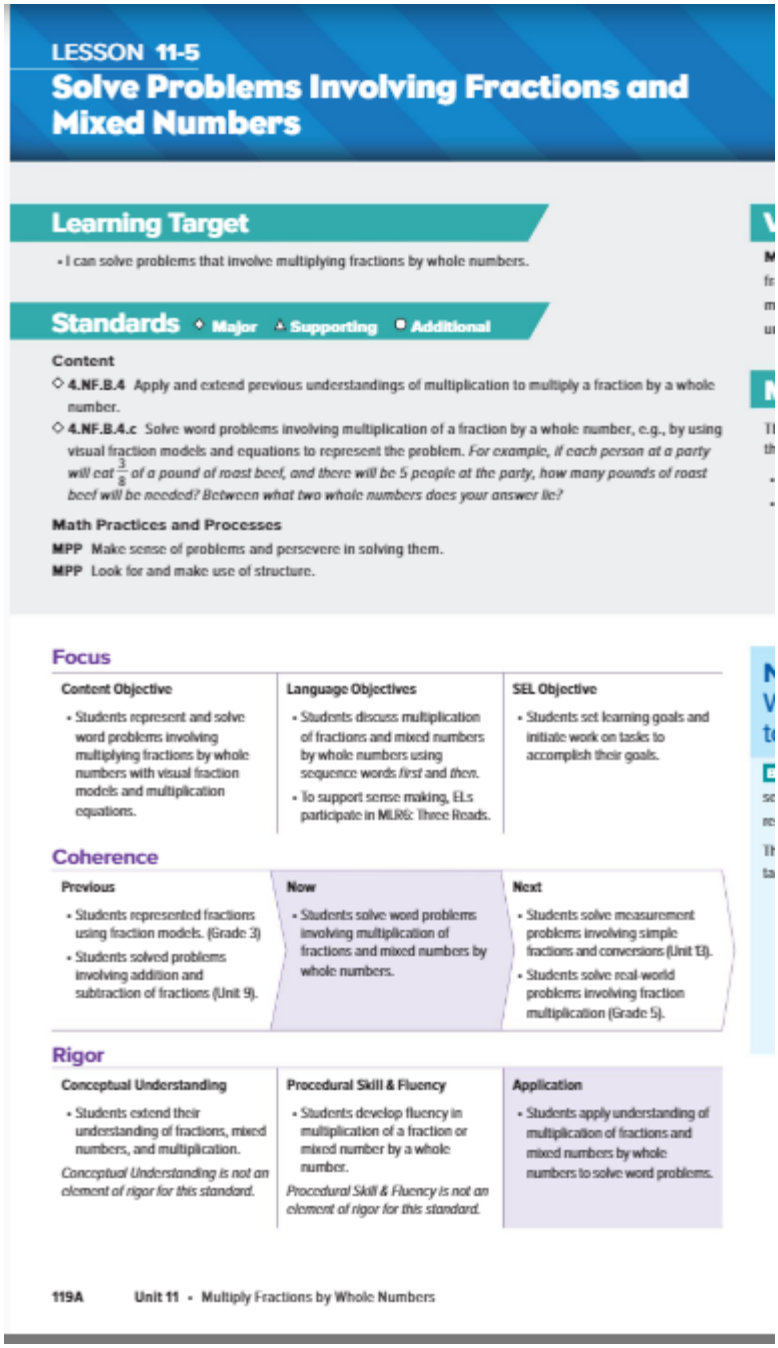
| Content Objective | Language Objectives | SEL Objective |
|---|---|---|
| • Students multiply mixed numbers by whole numbers by using strategies such as equivalent fractions and decomposing the mixed number into a whole number and fractional parts. | • Students articulate multiplying mixed numbers by whole numbers using *can* and *should*.<br>• To cultivate conversation, ELs participate in MLR8: Discussion Supports. | • Students demonstrate self-awareness of personal strengths and areas of challenge in mathematics. |

## Coherence

| Previous | Now | Next |
|---|---|---|
| • Students used fraction models to represent problems (Grade 3).<br>• Students multiplied fractions by whole numbers (Unit 11). | • Students multiply mixed numbers by whole numbers using various strategies. | • Students express fractions in decimal notation (Unit 12).<br>• Students find products using decimal notations (Grade 5). |

## Rigor

| Conceptual Understanding | Procedural Skill & Fluency | Application |
|---|---|---|
| • Students build understanding of multiplying mixed numbers by whole numbers. | • Students build proficiency in multiplying mixed numbers by whole numbers. | • Students apply their understanding of multiplication of mixed numbers by whole numbers to real-world problems.<br>*Application is not a targeted element of rigor for this standard.* |



LESSON 11-5

## Solve Problems Involving Fractions and Mixed Numbers

### Learning Target

- I can solve problems that involve multiplying fractions by whole numbers.

### Standards ◆ Major ▲ Supporting ● Additional

**Content**

◇ **4.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

◇ **4.NF.B.4.c** Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

**Math Practices and Processes**

**MPP** Make sense of problems and persevere in solving them.

**MPP** Look for and make use of structure.

### Focus

| Content Objective | Language Objectives | SEL Objective |
|---|---|---|
| • Students represent and solve word problems involving multiplying fractions by whole numbers with visual fraction models and multiplication equations. | • Students discuss multiplication of fractions and mixed numbers by whole numbers using sequence words *first* and *then*.<br>• To support sense making, ELs participate in MLR6: Three Reads. | • Students set learning goals and initiate work on tasks to accomplish their goals. |

### Coherence

| Previous | Now | Next |
|---|---|---|
| • Students represented fractions using fraction models. (Grade 3)<br>• Students solved problems involving addition and subtraction of fractions (Unit 9). | • Students solve word problems involving multiplication of fractions and mixed numbers by whole numbers. | • Students solve measurement problems involving simple fractions and conversions (Unit 13).<br>• Students solve real-world problems involving fraction multiplication (Grade 5). |

### Rigor

| Conceptual Understanding | Procedural Skill & Fluency | Application |
|---|---|---|
| • Students extend their understanding of fractions, mixed numbers, and multiplication.<br>*Conceptual Understanding is not an element of rigor for this standard.* | • Students develop fluency in multiplication of a fraction or mixed number by a whole number.<br>*Procedural Skill & Fluency is not an element of rigor for this standard.* | • Students apply understanding of multiplication of fractions and mixed numbers by whole numbers to solve word problems. |



## Integration of Career Readiness, Life Literacies and Key Skills

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|---|---|
| 9.1.2.CR.1 | Recognize ways to volunteer in the classroom, school and community. |
| 9.4.2.CI.1 | Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2). |
| 9.4.2.CI.2 | Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a). |
| 9.1.2.CR.2 | List ways to give back, including making donations, volunteering, and starting a business. |
| 9.1.2. FI.1 | Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards). |

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| 9.4.2.CT.2 | Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3). |
| 9.4.2.CT.3 | Use a variety of types of thinking to solve problems (e.g., inductive, deductive). |
| 9.1.2.FP.1 | Explain how emotions influence whether a person spends or saves. |
| 9.1.2.FP.3 | Identify the factors that influence people to spend or save (e.g., commercials, family, culture, society). |
| 9.4.2.DC.3 | Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4). |
| 9.1.2.PB.1 | Determine various ways to save and places in the local community that help people save and accumulate money over time. |
| 9.1.2.PB.2 | Explain why an individual would choose to save money. |
| 9.4.2.DC.6 | Identify respectful and responsible ways to communicate in digital environments. |
| 9.4.2.DC.7 | Describe actions peers can take to positively impact climate change (e.g., 6.3.2.CivicsPD.1). |
| 9.4.2.TL.2 | Create a document using a word processing application. |
| 9.4.2.TL.5 | Describe the difference between real and virtual experiences. |
| 9.4.2.TL.6 | Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.). |
| 9.4.2.TL.7 | Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts (e.g., W.2.6., 8.2.2.ED.2). |

## Technology and Design Integration

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| 8.1.2.CS.1 | Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences. |
| 8.1.2.DA.1 | Collect and present data, including climate change data, in various visual formats. |
| 8.1.2.DA.3 | Identify and describe patterns in data visualizations. |
| 8.1.2.DA.4 | Make predictions based on data using charts or graphs. |
| 8.1.2.AP.4 | Break down a task into a sequence of steps. |
| 8.1.2.AP.5 | Describe a program's sequence of events, goals, and expected outcomes. |
| 8.2.2.ITH.4 | Identify how various tools reduce work and improve daily tasks. |

## Interdisciplinary Connections

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| LA.RI.4 | Reading Informational Text |
| LA.RI.4.1 | Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text. |
| LA.RI.4.3 | Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. |
| LA.RI.4.4 | Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area. |
| LA.RI.4.5 | Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text. |
| LA.RI.4.6 | Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided. |

| | |
|---|---|
| LA.RI.4.8 | Explain how an author uses reasons and evidence to support particular points in a text. |
| LA.RI.4.9 | Integrate and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) information from two texts on the same topic in order to write or speak about the subject knowledgeably. |
| LA.SL.4 | Speaking and Listening |
| LA.SL.4.1 | Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. |
| LA.SL.4.2 | Paraphrase portions of a text read aloud or information presented in diverse media and formats (e.g., visually, quantitatively, and orally). |
| LA.SL.4.3 | Identify the reasons and evidence a speaker provides to support particular points. |
| LA.SL.4.4 | Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. |

## Differentiation

- Understand that gifted students, just like all students, come to school to learn and be challenged.
- Pre-assess your students. Find out their areas of strength as well as those areas you may need to address before students move on.
- Consider grouping gifted students together for at least part of the school day.
- Plan for differentiation. Consider pre-assessments, extension activities, and compacting the curriculum.
- Use phrases like "You've shown you don't need more practice" or "You need more practice" instead of words like "qualify" or "eligible" when referring to extension work.
- Encourage high-ability students to take on challenges. Because they're often used to getting good grades, gifted students may be risk averse.

- **Definitions of Differentiation Components**:

    - Content – the specific information that is to be taught in the lesson/unit/course of instruction.
    - Process – how the student will acquire the content information.
    - Product – how the student will demonstrate understanding of the content.
    - Learning Environment – the environment where learning is taking place including physical location and/or student grouping

**Differentiation occurring in this unit:**




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## Modifications and Accommodations

Refer to QSAC EXCEL SMALL SPED ACCOMMOCATIONS spreadsheet in this discipline.

**Modifications and Accommodations used in this unit:**

## Benchmark Assessments

**Benchmark Assessments** are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

**Schoolwide Benchmark assessments:**

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

DRA

**Additional Benchmarks used in this unit:**

Reveal Unit assessments

## Formative Assessments

Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

**Formative Assessments used in this unit:**

Teacher observation

Checklists

Questioning and Discussion

Quizzes

## Summative Assessments

**summative assessments** evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

**Summative assessments for this unit:**

End of Unit assessments

## Instructional Materials

See above

## Standards

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|---|---|
| MA.4.NF.B.4 | Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. |
| MA.4.NF.B.4a | Understand a fraction $a/b$ as a multiple of $1/b$. |
| MA.4.NF.B.4b | Understand a multiple of $a/b$ as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. |