

## ► Grade 4 Topic 9: Understand Addition and Subtraction of Fractions

**Big Conceptual Idea:** [Number and Operations- Fractions](#) (pp. 121-125)

Prior to instruction, view the *Topic 9 Professional Development Animation* located in *Pearson Realize* online). Read the *Teacher Edition (TE)*, *Cluster Overview/Math Background* (pp. 461A-461F), the *Topic Planner* (pp. 461I-461K), all 11 lessons, and the *Topic Assessment* (pp. 537-538A).

**Topic 9 & Topic 11**  
*Understanding Addition and Subtraction of Fractions & Represent and Interpret Data on Line Plots*  
 Number of lessons: 15  
 A/D/E: 4 days  
**NVACS Focus:**  
 NF.B & A, MD.B  
**Total Days: ~19**

<p><b>Mathematical Background:</b>                  Read Cluster Overview (TE, pp. 461A-461F)</p>	<p><b>Topic Essential Questions:</b>                  How can we use estimation to determine the reasonableness of sums and differences when adding/subtracting fractions referring to the same whole? How do you add and subtract fractions and mixed numbers with like denominators? How can fractions be added and subtracted on a number line?</p> <p><i>Reference TE p. 461 and Answering the Topic Essential Questions (TE, pp. 535-536) for key elements of answers to the Essential Questions.</i></p>
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[4<sup>th</sup> grade Curriculum Pacing Framework: Balanced Calendar](#)

**The lesson map for this topic is as follows:**

9-7	9-1	9-2	9-3	9-4	9-5	9-6	9-8	11-1	9-9	11-2	9-10	11-3	9-11	11-4	Assessment
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4 A/D/E days used strategically throughout the topic

**Instructional note:**

Topics 9 and 11 are combined to make connections with fractions on a number line. In these topics, students are finding differences of values on the line plot, as well as making number lines to graph the given data. Consider teaching lessons 9-7, 9-1 to 9-8, and then alternate between the two topics: 11-1, 9-9, 11-2, 9-10, 11-3, 9-11 and 11-4. Be aware lesson 9-7 is taught before 9-1, as students estimate fraction sums and differences with unlike denominators. Lesson 9-7 connects to the work done around equivalent fractions in Topic 8. This was field tested in four (4) WCSD Title I schools during the 2017/2018 school year, and found to better support conceptual understanding and concept development.

Topic 9 is the beginning of a cluster for standard 4.NF.B, “build fractions from unit fractions by applying and extending previous understanding of operations of whole numbers” (Nevada Academic Content Standards (NVACS), 2010). Focus instruction on 4.NF.B.3.A-D. In the standards, students will “add and subtract fractions and mixed numbers with like denominators by understanding addition and subtraction as joining and separating parts referring to the same whole. Decompose fractions with the same denominator in more than one way. Add and subtract fractions by replacing each mixed number with an equivalent fraction, use the properties of operation and the relationship between addition and subtraction by using visual models and equations to represent the problem” (NVACS, 2010, 4.NF.B).

“The idea that the top number (numerator) counts and the bottom number (denominator) tells what is counted makes addition and subtraction of like fractions the same as adding and subtracting whole numbers” (Van de Walle, Karp, & Bay-Williams, 2010, p. 315). A key idea about fractions that students must come to understand is that a fraction does not say anything about the size of the whole or the size of the parts. A fraction tells us only the *relationship between* the part and the whole” (Van de Walle, et al., 2010, p. 288). When students add and subtract fractions, they need to consider that both fractions are part of the same whole.

Small identifies common misconceptions about adding fractions, “because of students’ greater comfort with whole numbers than fractions, when they see a calculation such as  $2/3 + 1/3$ , it is natural for them to add numerators and add denominators to get  $3/6$ . Hopefully, if students have been encouraged to estimate, they would realize that it is impossible to start with more than  $1/2$  (which  $2/3$  is), add a positive amount, and end up with  $3/6$ , which is  $1/2$ ” (2014, p. 51). “The development of fraction number sense should most certainly include estimation of fraction sums and differences. In most cases students’ estimates should not be much more than  $1/2$  away from the exact sum or difference” (Van de Walle, et al., 2010, p. 311).

Models are important when students are beginning to understand fractional concepts. The different models give students various opportunities to learn fractions. Please see the *Instructional Note* in WCSD Topic 8 Curriculum Guide for more information on the different types of models. Understanding that concrete tools are important as students begin their work with adding and subtracting fractions will support them throughout the topic.

**Focus Math Practice 4: Model with math**

Focus on opportunities for students to develop *Mathematical Practice 4* behaviors, as this is the focus of the Math Practices and Problem Solving, lesson 9-10. Reference the *Teacher’s Edition* (pp. F24-F24A) and the NVACS (2010, p. 7).

## ► Grade 4 Topic 11: Represent and Interpret Data on Line Plots

**Big Conceptual Idea:** [Measurement and Data \(Data Part\)](#) (pp. 66-68)

*Prior to instruction, view the Topic 11 Professional Development Video (located in Pearson Realize online). Read the Teacher Edition (TE), Cluster Overview/Math Background (pp. 587A-587F), the Topic Planner (pp. 587I-587J), all 4 lessons, and the Topic Assessments (pp. 621-622A).*

<p><b>Mathematical Background:</b> Read Cluster Overview- (TE, pp. 587A-587F)</p>	<p><b>Topic Essential Questions:</b> How can you read data on a line plot? How can you make a line plot?</p> <p><i>Reference TE (p. 587) and Answering the Topic Essential Questions (TE, pp. 619-620) for key elements of answers to the Essential Questions.</i></p>
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### **Instructional note:**

Topic 11 focuses on representing and interpreting line plots. Focus for standard MD.B.4, is to make a line plot to display a data set of measurement in fractions of a unit ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ) (Nevada Academic Content Standards (NVACS), 2010). “**Mathematics** is about numbers and their operations, generalizations and abstractions; it is about spatial configurations and their measurements, transformations and abstractions. **Statistics** is also about numbers-but numbers in context; these are called data. Statistics is about variables and cases, distribution and variation, purposeful design or studies, and role of randomness in the design of studies and interpretation of results” (Van de Walle, Karp, Lovin, & Bay Williams, 2014, p. 378).

There are two main types of data; categorical and numerical. Kindergartners begin to work with categorical data. This continues until second grade when both categorical and numerical data is used. Beginning in second grade, students may begin “discussing and interpreting visual features of line plots, such as ‘outlier’ value” (Progression Document for Common Core Math Standards, Measurement and Data, pg. 10).

Throughout Topic 11, students interpret the data presented in the line plot. “Line plots or dot plots count things along a numerical scale. The number line is drawn and an X or • is made above the corresponding data elements. The advantage of a line/dot plot is that every piece of data is shown on the graph” (Van de Walle, Karp, Bay-Williams, 2010, p. 446). One way students will interpret the line plot is by looking for outliers. An outlier is any number in the data set that is very different from the rest of the numbers. Not only do students look for outliers, interpretation of a line plot can be represented by the “most common” values on the given line plot. Students can also look for gaps and cluster on the line plot and interpret the reason for a gap or cluster (often times referenced as the ‘shape’ of the data).

### **Focus Math Practice 3: Critique reasoning**

Focus on opportunities for students to develop *Mathematical Practice 3* behaviors, as this is the focus of the Math Practices and Problem Solving, lesson 11-4. Reference the Teacher’s Edition (pp. F23-F23A) and the NVACS (2010, p. 7).

**Note:** The purpose of the curriculum guides is for additional considerations. Therefore, not all components may have additional notes included in this guide.

<b>Essential Academic Vocabulary Topics 9 &amp; 11</b> Use these words consistently during instruction.	
<b>New Academic Vocabulary:</b> (First time explicitly taught)	<b>Review Academic Vocabulary:</b> (Vocabulary explicitly taught in prior grades or topics)
decompose compose mixed fraction line plot outlier	<i>fraction</i> <i>numerator</i> <i>denominator</i> <i>reasonable</i> <i>equivalent fraction</i> <i>Associative Property of Addition</i> <i>Commutative Property of Addition</i> <i>data</i> <i>scale</i>

**Additional terminology that students may need support with:** equations, whole, part of the whole, expression, rename, relationship, most often, gaps and clusters

**Collaborative Team Conversations (CTC)**

Consider using *one* of the following as part of the formative assessment process at the lesson level to **collect student work** to analyze for **evidence of mathematical understanding**:

**Guiding questions:** "Are students able to add or subtract fractions with like denominators using tools, strategies or models? Are students able to create and interpret a line plot based on the given data?"

Lesson	Evidence	Look for
9-5	<i>Solve &amp; Share</i> (student work samples)	Focus CTC around the big idea: <ul style="list-style-type: none"> <li>students tools, strategies and models.</li> <li>students decomposing and reasoning about the size of the whole.</li> </ul>
11-3	<i>Solve &amp; Share</i> (student work samples)	Focus CTC around the big idea: <ul style="list-style-type: none"> <li>students creating an accurate number line and line plot.</li> <li>students interpreting the line plot correctly based on the information represented.</li> </ul>

Learning Cycle Assessments (summative)	<b>Topic 9 &amp; 11 Performance Assessments</b> SE pp. 537-538 and SE pp. 622	Use <i>Scoring Guide</i> TE pp. 537-538A and 622
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Standards listed in **bold** indicate a focus of the lesson.

NVACS (Content and Practices)	Mathematical Development of the Big Idea	Instructional Clarifications & Considerations
<b>Lesson 9-7: Estimate Fraction Sums and Differences</b>		
<b>4.NF.B.3a</b>  MP.1 MP.2 MP.3 MP.4 MP.8	<p><b>Access Prior Learning:</b> In previous lessons, students added and subtracted fractions using various tools and representations.</p> <p><b>Beginning of the Big Idea:</b> In this lesson, students will estimate sums and differences by replacing fractions with benchmark fractions that are close and easy to add or subtract.</p>	<p><b>Note:</b> In this lesson, students will estimate fractions with different denominators. Consider doing this lesson before 9-1 as it reinforces concepts in Topic 8. 9-7 builds an understanding of benchmark fractions to estimate sums and differences as well as uses the number line to show equivalent fractions in order to add and subtract fractions with like denominators.</p> <p><b>Solve &amp; Share:</b> Consider using the <i>Solve &amp; Share</i> as a Number Talk. After students mentally decide if the expressions are greater or less than one (problems 1-2), have them explain how they know. Repeat the same with problems 3-4, except have students decide if the expressions are less than or greater than <math>\frac{1}{2}</math>. Consider recording students' generalization in regards to estimation.</p> <p><b>Visual Learning:</b> Consider reading <i>Prevent Misconceptions</i> prior to lesson, to guide students as they work through the <i>Visual Learning</i> (TE, p. 502). The <i>Visual Learning Animation</i> guides students to understand they can rename a whole number to an equivalent fraction.</p> <p><b>Convince Me:</b> Consider using the <i>Convince Me!</i> formatively to assess student understanding that fractions must refer to the same whole before they can be compared, added or subtracted. This is important for students to show an understanding of fractions when comparing, adding or subtracting.</p>
<b>Lesson 9-1: Model Addition of Fractions</b>		
<b>4.NF.B.3a</b>  MP.1 MP.2 MP.3 MP.4 MP.5	<p><b>Access Prior Learning:</b> In third grade, students developed an understanding of the meaning of addition of whole numbers as joining and they developed an understanding of the meaning of a fraction <math>a/b</math> as a number of unit fractions <math>1/b</math>.</p> <p><b>Beginning of the Big Idea:</b> In this lesson, ideas learned in the previous grades are brought together through representations to show how fractions with the same denominator can be joined.</p>	<p><b>Solve &amp; Share:</b> Consider giving students the opportunity to use tools and other representations to solve the <i>Solve &amp; Share</i> problem.</p> <p><b>Look Back:</b> Consider facilitating a discussion around the <i>Look Back!</i> as students begin to understand conceptually how to add fractions with like denominators through concrete tools.</p> <p><b>Visual Learning:</b> Consider reading the <i>Prevent Misconception</i> to support students as they add like denominators using fraction strips (length models) and a number line model (TE, p. 466).</p> <p>Along with using the fraction strips and making a number line presented in the book, consider encouraging students to use two-colored counters, as the <i>Visual Learning</i> problem is fractions of a set (set model).</p> <p><b>Note:</b> Students may struggle with the concept of "either", as well as using the fraction strips to model the context.</p>

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		<p><b>Guided Practice:</b> Consider facilitating a discussion around items 1-3 as students continue to develop a conceptual understanding with adding fractions with like denominators.</p> <p><b>Assess and Differentiate/Intervention Activity:</b> Consider using the <i>Intervention Activity</i> with all students, as students use a real-world context to add fractions with like denominators.</p>
<b>Lesson 9-2: Decompose Fractions</b>		
<p><b>4.NF.B.3b</b></p> <p>MP.2 MP.4 MP.5</p>	<p><b>Access Prior Learning:</b> In third grade, students used number lines to find simple equivalent fractions and to explain why they are equivalent.</p> <p><b>Developing the Big Idea:</b> In this lesson, students continue to find equivalent fractions, by using the number line and area models.</p>	<p><b>Solve &amp; Share:</b> Consider making an anchor chart of students' decomposition of <math>11/8</math> pounds into three bowls. Students will see that there are many ways to decompose fractions when adding.</p> <p><b>Look Back:</b> Consider facilitating a discussion around the <i>Look Back!</i> as students revisit equivalent fractions.</p> <p><b>Visual Learning:</b> The mathematical terminology of decompose and compose fractions is discussed in the <i>Visual Learning Animation</i>. Consider having students complete the problem before showing the animation to make connections with their answer.</p> <p><b>Convince Me:</b> Consider using the <i>Convince Me!</i> to facilitate a discussion as students continue to connect addition of fractions to the concrete tool, such as fraction strips.</p> <p><b>Another Example:</b> Consider having a discussion with the whole class about the <i>Another Example!</i> as students decompose a fraction greater than 1 (mixed number). Consider calling a mixed number a fraction greater than one also and not just a mixed number. This supports students' knowledge of how fractions can have whole numbers and part of the whole.</p> <p><b>Assess and Differentiate/Intervention Activity:</b> Consider using the <i>Intervention Activity</i> with all students as this may introduce fraction circles in a different way than students have seen before.</p>
<b>Lesson 9-3: Add Fractions with Like Denominators</b>		
<p><b>4.NF.B.3a</b> <b>4.NF.B.3d</b></p> <p>MP.1 MP.3 MP.4 MP.7</p>	<p><b>Access Prior Learning:</b> In previous lessons, students connected the meaning of fraction addition to whole number addition, and that a fraction greater than 1 can be decomposed different ways.</p> <p><b>Developing the Big Idea:</b> In this lesson, students will continue adding fractions with like denominators by decomposing the fraction into unit fractions and then joining them together to find the total.</p>	<p><b>Solve &amp; Share:</b> Consider giving students the opportunity to use tools and models to solve the problem, and removing the fraction strip model to elicit more students' strategies.</p> <p><b>Look Back:</b> Consider facilitating a discussion around the <i>Look Back!</i> to see if students make connections between the denominators in the equation.</p> <p><b>Visual Learning:</b> In the <i>Visual Learning</i>, students solve the problem by using a number line model. Consider having students make their own number line in their math journal. Consider emphasizing the idea that the denominators represent the same whole, and this is why students can add fractions.</p> <p><b>Convince Me:</b> Consider facilitating a discussion around the <i>Convince Me!</i> as students construct an argument around Frank's error.</p> <p><b>Another Example:</b> Consider having a discussion around the <i>Another Example!</i>, as students write the fraction greater than one as a mixed number. Discuss how students know when a whole number is formed.</p> <p><b>Guided Practice:</b> Child-watch for students who may reason through item 1, <i>Guided Practice</i>, by using the table from the <i>Visual Learning Animation</i>.</p>
<b>Lesson 9-4: Model Subtraction of Fractions</b>		
<p><b>4.NF.B.3a</b></p> <p>MP.1 MP.2 MP.4</p>	<p><b>Access Prior Learning:</b> In the previous lesson, students developed the idea that a fraction <math>a/b</math>, where <math>a &gt; 1</math>, can be decomposed into unit fractions, <math>1/b</math>.</p>	<p><b>Solve &amp; Share:</b> Consider having multiple tools readily available and giving students an opportunity to represent this problem by asking students to try multiple ways to solve the problem.</p>

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<p>MP.5 MP.6</p>	<p><b>Beginning of the Big Idea:</b> In this lesson, students will subtract fractions <math>a/b - c/b</math>, where <math>a &gt; 1</math>, is given meaning by first decomposing <math>a/b</math> into unit fractions, <math>1/b</math>, and then separating <math>c</math> unit fractions from the total.</p>	<p><b>Visual Learning:</b> Consider reading the <i>Prevent Misconceptions</i> questions regarding subtracting fractions and apply these during the <i>Visual Learning Animation</i> (TE, p. 484). Students write one whole as a fraction to subtract fractions. Use this opportunity to review that fractions are equal parts and not necessarily rectangle.</p> <p><b>Another Example:</b> The <i>Another Example</i> builds upon the <i>Visual Learning Animation</i> and has students write the difference as a fraction or number greater than one (mixed number) using fraction strips.</p> <p><b>Another Look! On Homework &amp; Practice pg. 487</b> The <i>Another Look!</i> represents the subtraction of fractions using another strategy: Fraction Circles.</p> <p><b>Independent Practice/Math Practices and Problem Solving:</b> Students do not need to do all the problems in their Student Edition. Ask students to complete the <i>Quick Check</i> items (marked with a pink check mark) first and continue on to other items as appropriate. Consider giving students multiple opportunities to use various strategies, tools and models to complete the problems.</p> <p><b>Assess and Differentiate/Intervention Activity:</b> Consider using the <i>Intervention Activity</i> with all students, but give students who are having difficulty with subtraction of fractions an opportunity to use tools and models.</p>
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**Lesson 9-5: Subtract Fractions with Like Denominators**

<p>4.NF.B.3a 4.NF.B.3d  MP.2 MP.3 MP.4</p>	<p><b>Access Prior Learning:</b> In the previous lesson, students subtracted fractions with like denominators by decomposing the minuend into the sum of two fractions and then separating from that the subtrahend (the second number).</p> <p><b>Developing the Big Idea:</b> In this lesson, students will use the inverse relationship between addition and subtraction to find the difference of two fractions with like denominators.</p>	<p><b>Solve &amp; Share:</b> Consider looking for students who use a number line as the context deals with distance.</p> <p><b>Visual Learning:</b> Consider reading <i>Prevent Misconceptions</i> to make connections between adding and subtracting fractions with like denominators (TE, p. 490). In the <i>Visual Learning</i>, students compare a number line model and a bar diagram to solve the problem. Consider emphasizing that the denominators represent our whole or unit, so they stay the same while subtracting. Remind students about equations and have them write the equation that goes with the problem.</p> <p><b>Guided Practice:</b> In the <i>Guided Practice</i>, item 1 students review equivalent fractions.</p> <p><b>Independent Practice/Math Practices and Problem Solving:</b> For item 21, students use a set model to subtract. Set models are sets of objects understood to be the whole and each subset makes up fractional parts of the whole (Van de Walle, et. al, 2010, p. 290).</p> <p><b>Assess and Differentiate/Intervention Activity:</b> Consider facilitating a discussion around the <i>Intervention Activity</i> as the activity reviews the meaning of the numerator and denominator.</p> <p>*CTC: <i>Solve &amp; Share</i> (student work samples)</p>
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**Lesson 9-6: Add and Subtract Fractions with Like Denominators**

<p>4.NF.B.3a  MP.2 MP.4 MP.5</p>	<p><b>Access Prior Learning:</b> In this topic, students have added and subtracted fractions with like denominators by joining segments or by separating segments on a number line.</p> <p><b>Developing the Big Idea:</b> In this lesson, students continue adding and subtracting like fractions by extending previous knowledge to counting forward or counting backward on a number line depending on the operation.</p> <p><b>Look Ahead:</b> Emphasize the number line strategy, as it will be used in Topics 10-12.</p>	<p><b>Solve &amp; Share:</b> Consider giving students opportunity to use various strategies, tools or models to solve the problem. Consider removing the "Think Bubble" as it gives students the idea of using the number line. Look for students who use the number line on their own.</p> <p><b>Look Back:</b> Consider using the <i>Look Back!</i> as it revisits equivalent fractions.</p> <p><b>Visual Learning:</b> In the <i>Visual Learning</i>, students use a number line to add like fractions by using jumps on the number line. Consider giving students opportunity to solve the problem and share how they solved it. Look at what derived facts, or known facts, students used to help them make the jumps on the number line.</p> <p><b>Note:</b> Give students the opportunity to use different size jumps instead of one whole jump. For example, students may need to jump one by one, two by two, etc.</p> <p style="text-align: right;"><i>-continues on next page-</i></p>
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		<p><b>Another Example:</b> The <i>Another Example!</i> asks students to solve a subtraction problem by using a number line and counting backwards. Again, consider giving students opportunity to solve the problem and share how they solved it. Look at what derived facts, or known facts, students used to help them make the jumps on the number line.</p> <p><b>Independent Practice/Math Practices and Problem Solving:</b> For item 11, have students estimate before solving the problem.</p>
<b>Lesson 9-8: Model Addition and Subtraction of Mixed Numbers</b>		
<p><b>4.NF.B.3c</b></p> <p>MP.2 MP.3 MP.5</p>	<p><b>Access Prior Learning:</b> In previous topics and lessons, students have constructed arguments.</p> <p><b>Developing the Big Idea:</b> In this lesson, students will construct arguments about comparing fractional amounts.</p>	<p><b>Look Back:</b> Consider having students answer the <i>Look Back!</i> before they work on the <i>Solve &amp; Share</i> as it asks them to estimate the <i>Solve &amp; Share</i>.</p> <p><b>Solve &amp; Share:</b> Consider giving students the opportunity to use tools or representations to solve the problem. Consider having students solve the problem in a couple of different ways.</p> <p><b>Visual Learning:</b> Students use fraction strips and a number line to solve the problems. Consider giving students opportunity to solve the problem before showing the animation or having a discussion in regards to the <i>Visual Learning</i>. Consider reading the <i>Prevent Misconceptions</i> prior to teaching the lesson (TE, p. 508).</p>
<b>Lesson 11-1: Read Line Plots</b>		
<p><b>4.MD.B.4</b></p> <p>MP.2 MP.3 MP.6 MP.7</p>	<p><b>Access Prior Learning:</b> In third grade, students recorded data on line plots marked with half and quarter inches.</p> <p><b>Developing the Big Idea:</b> In this lesson, students extend their previous understanding to read line plots with fractional units.</p>	<p><b>Note:</b> Throughout the topic, dots are used instead of X's. Consider showing students the different representations for numbers on the line plot.</p> <p><b>Look Back:</b> Consider facilitating a discussion around the <i>Look Back!</i> as students begin to think about relationships on the line plot. Connect back to information discussed in the <i>Solve &amp; Share</i>.</p> <p><b>Visual Learning:</b> In the <i>Visual Learning Animation</i>, mathematical terminology for line plots is introduced. Consider facilitating a discussion around the information in the table and how this information is transferred to the line plot.</p> <p><b>Convince Me:</b> Consider facilitating a conversation around the <i>Convince Me!</i> as students interpret the data set with focus on the outlier as well as what the outlier represents on the line plot.</p> <p><b>Assess and Differentiate/Intervention Activity:</b> Consider using the <i>Intervention Activity</i> with all students. Students learn how to collect data and use the data collected to represent it on a line plot. Consider having students decide what numerical data to collect. Consider posing the questions from the <i>Intervention Activity</i> for students to think about and answer regarding the information they collected.</p>
<b>Lesson 9-9: Add Mixed Numbers</b>		
<p><b>4.NF.B.3c</b></p> <p>MP.1 MP.2 MP.3 MP.8</p>	<p><b>Access Prior Learning:</b> In the previous lesson, students used fraction strips and number lines to add mixed numbers, or fractions greater than one.</p> <p><b>Developing the Big Idea:</b> In this lesson, students will learn two procedures for adding mixed numbers, or fractions greater than one.</p>	<p><b>Look Back:</b> Consider having students do the <i>Look Back!</i> before finding the solution to the <i>Solve &amp; Share</i>, as it has students estimating the sum.</p> <p><b>Solve &amp; Share:</b> Consider giving students the opportunity to use tools, such as actual measuring cups or representations to solve the problem. Consider having students solve the problem in a couple of different ways.</p> <p><b>Visual Learning:</b> In the <i>Visual Learning</i>, students learn to use the properties of operations (Commutative and Associative Property) to add mixed numbers. Students use the strategies of breaking apart the mixed number to add or using equivalent fractions to add. Consider having students work out each way during the discussion around the <i>Visual Learning</i>. Consider having students compare the different strategies in the <i>Visual Learning</i>.</p> <p><b>Convince Me:</b> Connect the <i>Convince Me!</i> to the discussion during the <i>Visual Learning Animation</i>.</p> <p><b>Independent Practice/Math Practices and Problem Solving:</b> For item 23, have students estimate before solving the problem.</p>

Lesson 11-2: Make Line Plots		
<p>4.MD.B.4 4.NF.A.1</p> <p>MP.2 MP.3 MP.6</p>	<p><b>Access Prior Learning:</b> In previous grades, students have collected measurement data and displayed it using a line plot.</p> <p><b>Developing the Big Idea:</b> In this lesson, students will continue interpreting the line plots they make by displaying the information from the data collected.</p>	<p>(Possible 2-day lesson) <b>Note:</b> If this lesson is extended over 2-days, this will be one of the A/D/E days given for this topic on the WCSD Pacing Framework.</p> <p><b>Day 1:</b></p> <p><b>Solve &amp; Share:</b> Consider using the data given in the <i>Solve &amp; Share</i>, or consider collecting data on the number of pets students have in the class. Have students use the information collected to make a line plot. Represent the whole numbers with either a dot or X. This line plot uses whole numbers, as this may be the first experience with making a line plot.</p> <p><b>Look Back:</b> Consider facilitating a discussion around the <i>Look Back!</i> and the data collected in the <i>Solve &amp; Share</i> to discuss the data that occurs “most often” or mode.</p> <p><b>Day 2:</b></p> <p><b>Visual Learning:</b> Read the questions and <i>Prevent Misconceptions</i> before teaching the lesson (TE, p. 598). Consider using the table to have students make a line plot to represent the fractional data in the table. Consider using the questions given to facilitate a discussion around the <i>Visual Learning Animation</i>.</p> <p><b>Convince Me:</b> Consider having students complete the <i>Convince Me!</i> as a Gallery Walk (ELL Toolkit p. 22) to make the line plot with the shoe sizes. Have students generate their own questions regarding their line plot for students to answer as they visit the poster.</p>
Lesson 9-10: Subtract Mixed Numbers		
<p>4.NF.B.3c</p> <p>MP.1 MP.2 MP.3 MP.8</p>	<p><b>Access Prior Learning:</b> In the previous lesson, students used fraction strips and number lines to subtract mixed numbers, or fractions greater than one.</p> <p><b>Developing the Big Idea:</b> In this lesson, students will learn three procedures for subtracting mixed numbers, or fractions greater than one.</p>	<p><b>Solve &amp; Share:</b> Consider removing the bar diagram to elicit more student strategies. If students seem to be struggling, guide them through questions towards the bar diagram.</p> <p><b>Look Back:</b> Consider facilitating a discussion around the <i>Look Back!</i>, as students need multiple opportunities to estimate. Estimation is a good way for students to check for reasonableness of the answer.</p> <p><b>Visual Learning:</b> In the <i>Visual Learning</i>, students learn to rename a fraction to be able to subtract without making a negative number. Students will also subtract by using equivalent fractions. Consider facilitating a discussion around the different procedures presented in the <i>Visual Learning Animation</i> to subtract mixed numbers.</p> <p><b>Independent Practice/Math Practices and Problem Solving:</b> Consider giving students multiple opportunities to use various strategies, tools and models to complete the problems.</p>
Lesson 11-3: Use Line Plots to Solve Problems		
<p>4.MD.B.4</p> <p>MP.1 MP.2 MP.5 MP.8</p>	<p><b>Access Prior Learning:</b> In previous topics, students learned how to add and subtract mixed numbers. In the previous lessons, students learned to make and interpret line plots.</p> <p><b>Developing the Big Idea:</b> In this lesson, students will read the data from given or made line plots, and use the data to solve problems that include adding or subtracting mixed numbers.</p>	<p><b>Solve &amp; Share:</b> In the <i>Solve &amp; Share</i>, students have to find the difference between the longest and shortest caterpillar. Students are finding the range.</p> <p><b>Visual Learning:</b> Read the <i>Prevent Misconceptions</i> before teaching the lesson (TE, p. 604). In the <i>Visual Learning</i>, students compare information between two line plots. Notice the line plots have the same numerical scale, consider facilitating a discussion around the numerical scales and how if they were different the line plots would look different (manipulating data).</p> <p><b>Another Example:</b> In the <i>Another Example!</i>, students use the information in the line plots to decide the “most common or often” from the data. Students begin to think about averages or central tendencies. Also, consider asking students what the least common value is.</p> <p><b>Assess and Differentiate/Intervention Activity:</b> Consider using the <i>Reteach Activity</i> with all students. This activity will reinforce how to find the intervals of fractions on a number line.</p> <p>*CTC: <i>Solve &amp; Share</i> (student work samples)</p>

Lesson 9-11: Math Practices and Problem Solving- Model with Math		
<p>4.NF.B.3d 4.NF.B.3a</p> <p>MP.1 MP.2 MP.4 MP.5</p>	<p><b>Access Prior Learning:</b> In previous topics and lessons, students have used Math Practice 4: Model with math.</p> <p><b>Developing the Big Idea:</b> In this lesson, students will be able to develop good habits problem solvers use to model with math while adding and subtracting fractions with like denominators.</p>	<p>Throughout the lesson, students use bar diagrams to add and subtract fractions with like denominators. Consider giving students an opportunity to use the bar diagrams and write an equation that goes with the problem. Also, consider having students solve the problems using tools or other representations.</p> <p><b>Assess and Differentiate/Intervention Activity:</b> Consider facilitating a discussion around the <i>Reach Page</i> as students revisit variables and equations while applying this knowledge to the bar diagram.</p>
Lesson 11-4: Math Practices and Problem Solving- Critique Reasoning		
<p>4.MD.B.4</p> <p>MP.3 MP.1 MP.2 MP.4</p>	<p><b>Access Prior Learning:</b> In previous grades, topics and lessons, students have used MP.3 to critique the reasoning of others.</p> <p><b>Developing the Big Idea:</b> In this lesson, students critique the reasoning related to solving problems involving line plots.</p>	<p><b>Visual Learning:</b> In the <i>Visual Learning</i>, students are adding fractions with like denominators based on the information provided by the two line plots.</p> <p><b>Convince Me:</b> Consider facilitating a discussion around the <i>Convince Me!</i> as student critique Bev's reasoning based on the two line plots from the <i>Visual Learning Animation</i>.</p> <p><b>Independent Practice/Math Practices and Problem Solving:</b> Consider having students work on items 6-8 as they create and interpret a line plot based on the information provided in the table.</p>

### References

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