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| **Prerequisite Skills** **(Grade 4)** | **Unit Three Standards** **Grade 5** | **Looking Ahead** **(Grade 6)** |
| Generate equivalent fractions by understanding why fraction *a/b = (n x a)/(n x b)*Adding unit fractions ( ¼ + ¼ + ¼ + ¼ = 4/4 Decomposing fractions (2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8Add and subtract mixed numbers with like denominators – using equivalent fractions. | Number and Operations Fractions 1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In* *general, a/b + c/d = (ad + bc)/bd).** I can find common denominators.
* I can add and subtract fractions with unlike denominators using equivalent fractions.
* I can add and subtract mixed numbers with unlike denominators using equivalent fractions.
 | Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.  Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tablesMake tables of equivalent ratios relating quantities with whole number measurements. |
| Addition and subtraction referring to the same whole with like denominators using visual models and equations.Compare two fractions with different numerators and different denominators by: creating common numerators or denominators or by comparing to benchmark fraction ( ½ ). | Number and Operations Fractions 2: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For* *example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that* *3/7 < 1/2.** I can solve word problems using addition and subtraction of fractions with like and unlike denominators referring to the same whole.
* I can use benchmark fractions and number sense of fractions to check for reasonableness of answers.
 | Apply and extend previous understandings of multiplication and division to divide fractions by fractions. |
| Represent measurement quantities using diagrams that use a measurement scale.Create line plots that represent measurements in fractions of a unitSolve word problems (addition and subtraction) using data from line plots. | Measurement and Data 2: Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example,* *given different measurements of liquid in identical beakers, find the* *amount of liquid each beaker would contain if the total amount in all the* *beakers were redistributed equally.** I can identify benchmark fractions (1/2, ¼, 1/8).
* I can solve problems using line plots with fourths, halves, and eighths using any operation.
* I can make a line plot for measurements of fourths, halves, and eighths.
 | Understand that a set of collected data has a distribution which can be described by its center, spread, and overall shape.Recognize the difference between the measure of center and measure of variation.Display numerical data on dot plots, histograms, and box plots.Summarize numerical data. |

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| **Standard** | **Learner Objectives** |
| Number and Operations Fractions 1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In* *general, a/b + c/d = (ad + bc)/bd.* | * I can find common denominators.
* I can add and subtract fractions with unlike denominators using equivalent fractions.
* I can add and subtract mixed numbers with unlike denominators using equivalent fractions.
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| **What does this standard mean the students will know and be able to do?** |
| This standard builds on the work in fourth grade where students add fractions with like denominators. In fifth grade, the example provided in the standard 2/3 + ¾ has students find a common denominator by finding the product of both denominators. This process should come after students have used visual fraction models (area models, number lines, etc.) to build understanding before moving into the standard algorithm describes in the standard. **The use of these visual fraction models allows students to use reasonableness to find a common denominator prior to using the algorithm.** For example, when adding 1/3 + 1/6, Grade 5 students should apply their understanding of equivalent fractions and their ability to rewrite fractions in an equivalent form to find common denominators.Students should apply their understanding of equivalent fractions and their ability to rewrite fractions in an equivalent form to find common denominators. They should know that multiplying the denominators will always give a common denominator but may not result in the smallest denominator. |
| **Examples:** |
| **Example 1/3 + 1/6**I drew a rectangle and shaded 1/3. I knew that if I cut every third in half then I would have sixths. Based on my picture, 1/3 equals 2/6. Then I shaded in another 1/6 with stripes. I ended up with an answer of 3/6, which is equal to 1/2. |  | Present students with the problem 1/3 + 1/6. Encourage students to use the clock face as a model for solving the problem. Have students share their approaches with the class and demonstrate their thinking using the clock model. |

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| **Lessons and Resources for Number and Operations Fractions 1** |
| [Bank of Problems](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/CGI%205th%20Grade%20Fractions%20Story%20Bank.docx) | Unit 4 Inv 1, 2, 3 | [Resources for NF.1](http://www.quantiles.com/tools/qtaxon/231/?state=IA)  |
| [Choose, Explain, Test](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/chooseexplaintest.docx) | [Comparing Fractions to Benchmarks](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/comparing_fractions_to_benchmarks.pdf) | [Ordering Unit Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/orderingunitfractions.docx) |
| [Mixed Number and Improper Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/Mixed%20Numbers%20Improper%20Fractions.docx) |  |  |

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| **Emphasized Standards for Mathematical Practice** |
| [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively3.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure.html) |

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| **Standard** | **Learner Objectives** |
| Number and Operations Fractions 2: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For* *example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that* *3/7 < 1/2.* | * I can solve word problems using addition and subtraction of fractions with like and unlike denominators referring to the same whole.
* I can use benchmark fractions and number sense of fractions to check for reasonableness of answers.
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| **What does this standard mean the students will know and be able to do?** |
| This standard refers to number sense, which means students’ understanding of fractions as numbers that lie between whole numbers on a number line. Number sense in fractions also includes moving between decimals and fractions to find equivalents, also being able to use reasoning such as 7/8 is greater than3/4 because 7/8 is missing only 1/8 and 3/4 is missing 1/4 so 7/8 is closer to a whole. Also, students should use benchmark fractions to estimate and examine the reasonableness of their answers. Example, 5/8 is greater than 6/10 because 5/8 is 1/8 larger than ½ (4/8) and 6/10 is only 1/10 larger than 1/2 (5/10). |
| **Example****Your teacher gave you 1/7 of the bag of candy. She also gave your friend 1/3 of the bag of candy. If you and your friend combined your candy, what fraction of the bag would you have? Estimate your answer and then calculate. How reasonable was your estimate?** |
| **Student 1**1/7 is really close to 0. 1/3 is larger than 1/7, but still less than 1/2. If we put them together we might get close to 1/2.1/7 + 1/3= 3/21 + 7/21 = 10/21. The fraction does not simplify. I know that 10 is half of 20, so 10/21 is a little less than ½. | **Student 2**1/7 is close to 1/6 but less than 1/6, and 1/3 is equivalent to 2/6, so I have a little less than 3/6 or ½. |
| **Example****Jerry was making two different types of cookies. One recipe needed ¾ cup of sugar and the other needed 2⁄3 cup of sugar. How much sugar did he need to make both recipes?** |
| **Mental Estimation**A student may say that Jerry needs more than 1 cup of sugar but less than 2 cups. An explanation may compare both fractions to ½ and state that both are larger than ½ so the total must be more than 1. In addition, both fractions are slightly less than 1 so the sum cannot be more than 2. | **Area Model** | **Linear Model** |

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| **Lessons and Resources for Number and Operations Fractions 2** |
| [Bank of Problems](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/CGI%205th%20Grade%20Fractions%20Story%20Bank.docx) | Unit 4 Inv 1, 2, 3 | [Resources for NF.2](http://www.quantiles.com/tools/qtaxon/675/?state=IA) |
| [Part and Whole Tasks](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/partwholetasks.docx) | [First Estimates](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/firstestimates.docx) | [Addition and Subtraction of Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/Addition%20and%20Subtract%20Fraction.pdf) |
| [Zero, One-Half, or One](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/Zero%2C%20One-Half%20or%20One.docx) | [Close Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/Close_Fractions.docx) | [About How Much](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/About%20How%20Much.docx) |
| [Slicing Squares](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/5slicingsquares.pdf) |  |  |

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| **Emphasized Standards for Mathematical Practice** |
| [1. Make sense of problems and persevere in solving them.](http://elementarymath.dmschools.org/1-make-sense-of-problems-and-persevere-in-solving-them5.html) | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively3.html) | [3. Construct viable arguments and critique the reasoning of others.](http://elementarymath.dmschools.org/3-construct-viable-arguments-and-critique-the-reasoning-of-others2.html)  | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics.html) |
| [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically5.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision3.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning.html) |

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|  **Standard** | **Learner Objectives** |
| Measurement and Data 2: Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example,* *given different measurements of liquid in identical beakers, find the* *amount of liquid each beaker would contain if the total amount in all the* *beakers were redistributed equally.* | * I can identify benchmark fractions (1/2, ¼, 1/8).
* I can solve problems using line plots with fourths, halves, and eighths using any operation.
* I can make a line plot for measurements of fourths, halves, and eighths.
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| **What does this standard mean the students will know and be able to do?** |
| This standard provides a context for students to work with fractions by measuring objects to one-eighth of a unit. This includes length, mass, and liquid volume. Students are making a line plot of this data and then adding and subtracting fractions based on data in the line plot.Students apply their understanding of operations with fractions. They use either addition and/or multiplication to determine the total number of liters in the beakers. Then the sum of the liters is shared evenly among the ten beakers.Using a line plot to solve problems involving operations with unit fractions now includes multiplication and division. Revisit using a number line to solve multiplication and division problems with whole numbers. In addition to knowing how to use a number line to solve problems, students also need to know which operation to use to solve problems. |
| **Example:** |
| Students measured objects in their desk to the nearest ½, ¼, or 1/8 of an inch then displayed data collected on a line plot. How many object measured ¼? ½? If you put all the objects together end to end what would be the total length of all the objects? |  |

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| **Lessons and Resources for Measurement and Data 2** |
| Unit 9 Inv 1 | [Resources for MD.2](http://www.quantiles.com/tools/qtaxon/137/?state=IA) | [Resources for MD.2](http://www.quantiles.com/tools/qtaxon/224/?state=IA) |

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| **Emphasized Standards for Mathematical Practice** |
| [1. Make sense of problems and persevere in solving them.](http://elementarymath.dmschools.org/1-make-sense-of-problems-and-persevere-in-solving-them5.html) | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively3.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics.html) |
| [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically5.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision3.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure.html) |

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**Optional Whole Group Lesson Progression**

Unit Pacing: 8 weeks

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| **Resource** | **Location** | **Primary Focus** | **Standard** |
| Investigations | Unit 9* Inv 1 (1.1 – 1.6A)

\*See CC160-168 | * I can identify benchmark fractions (1/2, 1/4, 1/8).
* I can solve problems using line plots with fourths, halves, and eighths using any operation.
* I can make a line plot for measurements of fourths, halves, and eighths.
 | 5.MD.2 |
| Sharepoint | [Part and Whole Tasks](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/partwholetasks.docx)[Zero, One-Half, or One](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/Zero%2C%20One-Half%20or%20One.docx)[Close Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/Close_Fractions.docx)[About How Much](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/About%20How%20Much.docx) | * I can find common denominators.
* I can add and subtract fractions with unlike denominators using equivalent fractions.
* I can add and subtract mixed numbers with unlike denominators using equivalent fractions.
* I can solve word problems using addition and subtraction of fractions with like and unlike denominators referring to the same whole.
* I can use benchmark fractions and number sense of fractions to check for reasonableness of answers.
 | 5.NF.15.NF.2 |
| Sharepoint | [Mixed Number and Improper Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/Mixed%20Numbers%20Improper%20Fractions.docx) | * I can find common denominators.
* I can add and subtract fractions with unlike denominators using equivalent fractions.
* I can add and subtract mixed numbers with unlike denominators using equivalent fractions.
 | 5.NF.1 |
| Investigations | Unit 4* Inv 1
* Inv 2
* Inv 3
 | * I can find common denominators.
* I can add and subtract fractions with unlike denominators using equivalent fractions.
* I can add and subtract mixed numbers with unlike denominators using equivalent fractions.
* I can solve word problems using addition and subtraction of fractions with like and unlike denominators referring to the same whole.
* I can use benchmark fractions and number sense of fractions to check for reasonableness of answers.
 | 5.NF.15.NF.2 |
| Sharepoint | [Slicing Squares](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/5slicingsquares.pdf) |
| Sharepoint | [Ordering Unit Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/orderingunitfractions.docx) | * I can identify benchmark fractions (1/2, 1/4, 1/8).
* I can find common denominators.
* I can add and subtract fractions with unlike denominators using equivalent fractions.
* I can add and subtract mixed numbers with unlike denominators using equivalent fractions.
 | 5.NF.1 |
| Sharepoint | [Choose, Explain, Test](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/chooseexplaintest.docx) |
| Sharepoint | [Comparing Fractions to Benchmarks](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/comparing_fractions_to_benchmarks.pdf) | * I can identify benchmark fractions (1/2, 1/4, 1/8).
* I can find common denominators.
* I can add and subtract fractions with unlike denominators using equivalent fractions.
* I can add and subtract mixed numbers with unlike denominators using equivalent fractions.
* I can solve word problems using addition and subtraction of fractions with like and unlike denominators referring to the same whole.
* I can use benchmark fractions and number sense of fractions to check for reasonableness of answers.
 | 5.NF.15.NF.2 |
| Sharepoint | [First Estimates](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/firstestimates.docx) |
| Sharepoint | [Addition and Subtraction of Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%203/Addition%20and%20Subtract%20Fraction.pdf) |
| Quantiles | [Resources for NF.1](http://www.quantiles.com/tools/qtaxon/231/?state=IA) | * I can identify benchmark fractions (1/2, 1/4, 1/8).
* I can find common denominators.
* I can add and subtract fractions with unlike denominators using equivalent fractions.
* I can add and subtract mixed numbers with unlike denominators using equivalent fractions.
 | 5.NF.1 |

**Optional Whole Group Lesson Progression (Continued)**

Unit Pacing: 8 weeks

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| **Resource** | **Location** | **Primary Focus** | **Standard** |
| Quantiles | [Resources for NF.2](http://www.quantiles.com/tools/qtaxon/675/?state=IA) | * I can solve word problems using addition and subtraction of fractions with like and unlike denominators referring to the same whole.
* I can use benchmark fractions and number sense of fractions to check for reasonableness of answers.
 | 5.NF.2 |
| Quantiles | [Resources for MD.2](http://www.quantiles.com/tools/qtaxon/137/?state=IA) | * I can identify benchmark fractions (1/2, 1/4, 1/8).
* I can solve problems using line plots with fourths, halves, and eighths using any operation.
* I can make a line plot for measurements of fourths, halves, and eighths.
 | 5.MD.2 |
| Quantiles | [Resources for MD.2](http://www.quantiles.com/tools/qtaxon/224/?state=IA) |

\***Unit pacing approximate. Some lessons may take more or less than one day. The supplemental activities listed at the end of the lesson progression may be imbedded within the Unit 4 Investigation to build capacity for specific concepts. Use teacher discretion based on student need when planning unit.**