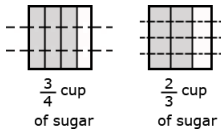| **Grade: 5** **Unit 1-Adding and Subtracting Fractions and Mixed Numbers**	**Subject:**　**Math** • **Time Frame: 22 days** • **Domain: Number and Operations-Fractions**	
Standards	Content Standards: 5.NF.1, 5.NF.2, 5.MD.2 http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf	Practice Standards: MP 1, 2, 3, 4, 5 ,6, 7, 8
Enduring Understandings	1. Fractions express quantities with greater precision. 2. There are multiple strategies to compare fractions. 3. There are multiple strategies to add and subtract fractions and mixed numbers. 4. Benchmark fractions help us estimate and determine if our calculations are reasonable. 5. Data can be displayed in various ways that help us understand and interpret it.	
Essential Questions	1. How do we add and subtract fractions with unlike denominators? 2. How can I compare fractions? 3. How can I add and subtract fractions and mixed numbers? 4. How can I make reasonable estimates of sums and differences with fractions? 5. Why display data in different ways?	
Vocabulary	Numerator, denominator, unit fraction, fraction, equivalent fractions, multiplier, simplify, un-simplify, benchmark, common denominator, common factor, greater than, less than, >,<, mixed number, add on, regroup, ungroup, line plot, estimate, round, situation equation, solution equation	

Priority and Supporting CCSS	Explanations and Examples*
5.NF.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.)*	**5.NF.1** Students should apply their understanding of equivalent fractions developed in fourth grade 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: • $\frac{2}{5}+\frac{7}{8}=\frac{16}{40}+\frac{35}{40}=\frac{51}{40}$ • $3\frac{1}{4}-\frac{1}{6}=3\frac{3}{12}-\frac{2}{12}=3\frac{1}{12}$
5.NF.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.*	**5.NF.2** Examples: Jerry was making two different types of cookies. One recipe needed ¾ cup of sugar and the other needed $\frac{2}{3}$ cup of sugar. How much sugar did he need to make both recipes? • Mental estimation: o 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 $\frac{3}{4}$ cup of sugar $\frac{2}{3}$ cup of sugar $\frac{3}{4}-\frac{9}{12}$ $\frac{2}{3}-\frac{8}{12}$ $\frac{3}{4}+\frac{2}{3}=\frac{17}{12}=\frac{12}{12}+\frac{5}{12}=1\frac{5}{12}$

* Source – Connecticut Core Standards for Mathematics as adapted from the Arizona Academic Content Standards
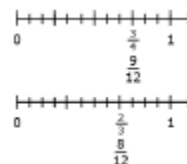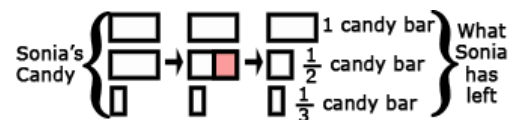
|	• Linear model
	Solution:
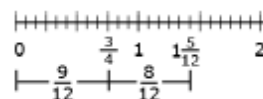
	Example: Using a bar diagram
	• Sonia had 2 1/3 candy bars. She promised her brother that she would give him ½ of a candy bar. How much will she have left after she gives her brother the amount she promised?
	
	Now students need to use equivalent fractions to find the total of 1 + ½ + 1/3.
	
	 If Mary ran 3 miles every week for 4 weeks, she would reach her goal for the month. The first day of the first week she ran 1 ¾ miles. How many miles does she still need to run the first week?
	   o Using addition to find the answer:1 ¾ +__ = 3
	   o A student might add 1 ¼ to 1 ¾ to get to 3 miles. Then he or she would add 1/6 more. Thus 1 ¼ miles + 1/6 of a mile is what Mary needs to run during that week.
	
	Example: Using an area model to subtract
	• This model shows 1 ¾ subtracted from 3 1/6 leaving 1 + ¼ + 1/6 which a student can then change to 1 + 3/12 + 2/12 = 1 5/12.
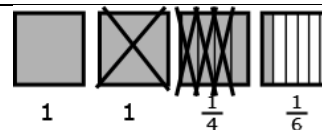
$3\frac{1}{6}$ and 1 ¾ can be expressed with a denominator of 12. Once this is done a student can complete the problem, 2 14/12 – 1 9/12 = 1 5/12.

• This diagram models a way to show how $3\frac{1}{6}$ and 1 ¾ can be expressed with a denominator of 12. Once this is accomplished, a student can complete the problem, 2 14/12 – 1 9/12 = 1 5/12.
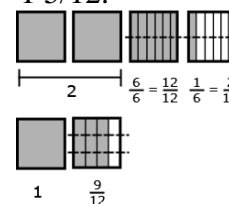
Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies for calculations with fractions extend from students' work with whole number operations and can be supported through the use of physical models.

Example:

• Elli drank $\frac{3}{5}$ quart of milk and Javier drank $\frac{1}{10}$ of a quart less than Ellie. How much milk did they drink all together?

   Solution:

   • $\frac{3}{5} - \frac{1}{10} = \frac{6}{10} - \frac{1}{10} = \frac{5}{10}$ This is how much milk Javier drank
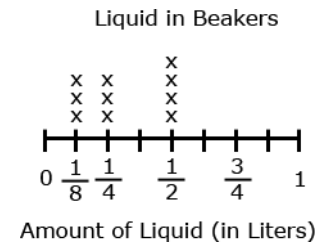
   • $\frac{3}{5} + \frac{5}{10} = \frac{6}{10} + \frac{5}{10} = \frac{11}{10}$ Together they drank $1\frac{1}{10}$ quarts of milk

	This solution is reasonable because Ellie drank more than ½ quart and Javier drank ½ quart so together they drank slightly more than one quart.
5.MD.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.*	**5.MD.2** Ten beakers, measured in liters, are filled with a liquid. Liquid in Beakers x x x x x x x x x x 0 $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 Amount of Liquid (in Liters) The line plot above shows the amount of liquid in liters in 10 beakers. If the liquid is redistributed equally, how much liquid would each beaker have? (This amount is the mean.) 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.

Resources
Math Expressions - Unit 1, Lessons 1-13 Soar to Success Math Intervention Mega Math Destination Math Common Core Mathematics-Newmark Learning- Units 14 and 15, Unit 22 Xtramath.org

Unit Assessments
Unit Test Formative Assessments Quick Quizzes Performance Task **Alternate Assessments from Other Sources:** **https://grade5commoncoremath.wikispaces.hcpss.org/Assessing+5.NF.1** **https://grade5commoncoremath.wikispaces.hcpss.org/Assessing+5.NF.2** **https://grade5commoncoremath.wikispaces.hcpss.org/Assessing+5.MD.2**

Technology: Videos, Websites, Links
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***This unit addresses MD.2 very briefly. Line plots will be revisited in a later unit, but more practice can be given using alternate resources.