

Theme: Use Equivalent Fractions for Addition and Subtraction**Ohio's Learning Standards:****Number and Operations – Fractions (NF)****Use equivalent fractions as a strategy to add and subtract fractions.**

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, $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. (In general, $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$.) 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 $\frac{2}{5} + \frac{1}{2} = \frac{7}{7}$, by observing that $\frac{3}{7} < \frac{1}{2}$.

MEASUREMENT AND DATA (MD)**Convert like measurement units within a given measurement system.**

5.MD.1 Convert among different-sized standard and measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-steps, real world problems. Represent and interpret data

5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). 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 in the total amount if all the beakers were distributed equally.

Number and Operations in Base Ten (NBT)**Understand the place value system.**

5.NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.

5.NBT.3 Read, write and compare decimals to thousandths.

a. Read and write decimals to thousandths using base-ten numerals, number names and expanded form.

b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

5.NBT.4 Use place value understanding to round decimals to any place.

Perform operations with multi-digit whole numbers and with decimals to hundredths.

5.NBT.7 Add, subtract, multiply and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and /or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Commentary:

Students will add and subtract fractions with like denominators and begin to explore adding tenths plus hundredths in preparation for work with decimals. Students will extend this and add and subtract fractions with unlike denominators using visual representation, reasoning, and equations. Students will convert both customary and standard measurements within the same system of measurement and solve multi-step word problems. They will discover base-ten conversions within the metric system. Students will learn adjacent places both to the left and to the right of a given place value. Connecting previous work with 10s, 100s, and 1,000s to power of ten gives students a sense of the magnitude of numbers to reinforce the relationship among place values. Students will continue to add and subtract whole numbers with fluency. They work with various division examples and explore to find efficient procedures for division. They will extend their understanding of decimals to solve problems and calculations to add, subtract, multiply, and divide decimals.

Resources:

Text: Math Expressions Common Core Assessment Guide

Unit 1 (Sections 1.1-1.13)

Unit 2 (Sections 2.1-2.10)

Unit 1: Math Literature Library: “Polar Bear Math: Learning About Fractions with Klondike and Snow”

Unit 2: Math Literature Library: “Sold! A Mathematics Adventure”

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Formative Assessments:

Source: Math Expressions: Common Core Assessment Guide

Unit 1 Quick Quiz 1 and 2,

Unit 1 Assessment form A, Unit 1 Assessment form B

Unit 2 Quick Quiz 1, 2, and 3 Unit 2 Assessment form A,

Unit 2 Assessment form B

Embedded Assessments:

Check for understanding embedded in each lesson.

Addressing Student Misconceptions and Common Errors**5. NF.A.1**

Watch for students who have surface understanding of the necessity for finding common denominators when adding and subtracting fractions and mixed numbers. Consistent practice in the form of number talks or using formative assessment task coupled with students explaining their thinking and considering the reasonableness of their solutions will help students to see the importance of thinking about the value of the numbers rather than using random calculations. Relating the fractions to benchmarks will help students to determine whether their answer is reasonable. Two areas that should be explicit in providing meaningful situations including the size of the piece and that the fractions must refer to the same size whole.

5. NF.A.2

Students who struggle to determine the appropriate operation to solve a problem need more experience with the problem situations for addition and subtraction. They need to use strategies such as act it out, draw a picture, write an equation, or make a model to determine the correct operation.

5. MD.A.1

Some students may not pay attention to the unit of measurement when subtracting.

5. MD. B.2

Some students may not know what measurement to use if the object measures between $\frac{1}{8}$ and $\frac{1}{4}$ inch. To address this, help students understand the approximations can be used to measure to the closet $\frac{1}{8}$ inch and $\frac{1}{4}$ inch.

Addressing Student Misconceptions and Common Errors Cont.**5. NBT.A.1**

Students can get confused with the language describing the relationship between place values for whole numbers and decimal numbers. When moving from tenths to hundredths, the value is $\frac{1}{10}$ the value and not ten less than. Working with concrete models and pictorial representations and practicing with appropriate language will help students avoid confusion.

5. NBT. A.3

When comparing two decimals with different place values, students may have the misconception that $0.345 > 0.57$ because 345 is greater than 57 without considering the place of each value after the decimal point. Modeling these numbers using drawings or base ten blocks will help students to see that 0.57 is greater because there are more tenths. They should have many opportunities to use models and drawings to explain their thinking. Once students demonstrate using concrete materials, they should begin to explore why 0.57 is equivalent to 0.570 using models, place value understanding, and previous experience with equivalent fractions. If both decimal numbers have the same number of places, thousandths for example, students can then compare the number of thousandths in each decimal number to determine which is greater and which is less.

5. NBT. A.4

Students who are taught to round decimals by using a rule rather than place value understanding have difficulty determining places when rounding up or down. This is true with both whole numbers and decimals. For example, when rounding to the nearest tenth, a student might round 15.28 to 15.38. When using a number line model, students need to determine the numbers that the given number falls between. In the previous case it would be between 15.2 and 15.3. Using benchmark numbers such as 15.25, which falls exactly in the middle, will help the students determine the closest tenth. By placing the given point on the number line, students can determine to which tenth it is closer. Scaffold examples for students who are struggling with this concept.

5. NBT. B.7

Student misconceptions when working with decimal numbers are usually based on place value. Simply telling the students to line up the decimal points when adding and subtracting decimals does not build the important understanding that similar place values are to be added or subtracted and can lead to errors. Building on whole number experience using concrete materials and place value charts will help students to relate previous work with composing and decomposing whole numbers to composing and decomposing decimals.

Source: The Common Core Mathematics Companion: The Standards Decoded (What They Say, What They Mean, How to Teach Them)

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Suggested Pacing:**Unit 1: 25 days****Unit 2: 20 days**