

# Intervention Checklist

GRADES  
3 to 6

Number and Operations: Fractions



# Number and Operations: Fractions Checklist

## Category I: Understands and Compares Fractions

Category I	<b>1. Names Fractions</b> <i>Names <math>\frac{1}{4}</math>, <math>\frac{2}{3}</math>, <math>\frac{2}{6}</math>, and <math>2\frac{2}{3}</math> or <math>\frac{8}{3}</math> from visual models.</i>	<b>2. Represents Fractions</b> <i>Shows fractions <math>\frac{1}{4}</math>, <math>\frac{3}{4}</math>, <math>\frac{3}{8}</math>, and <math>\frac{5}{3}</math> using area and linear models.</i>	<b>3. Identifies Equivalent Fractions</b> <i>Identifies <math>\frac{1}{2} = \frac{3}{6}</math>.</i>	<b>4. Compares Fractions</b> <i>Compares <math>\frac{4}{5}</math> and <math>\frac{2}{5}</math>; compares <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math>; compares <math>\frac{2}{3}</math> and <math>\frac{3}{6}</math>; compares <math>\frac{3}{5}</math> and <math>\frac{7}{8}</math>.</i>
Models Mathematics	<b>Names and writes fractions from visual models.</b> ___ Names a unit fraction shown with an <i>area</i> model. ___ Names a non-unit fraction shown with an <i>area</i> model. ___ Names a fraction shown with a <i>linear</i> model. ___ Writes fractions.	<b>Creates a visual model of a fraction.</b> ___ Represents a unit fraction with an <i>area</i> model. ___ Represents a non-unit fraction with an <i>area</i> model. ___ Represents a fraction with a <i>linear</i> model.	<i>No representations required.</i>	<b>Represent the relationship between fractions.</b> ___ Creates a visual model of fractions ___ Uses the <, >, or = symbols accurately
Understands Structure of Fractions	<b>Identifies the meaning of the numerator and denominator.</b> ___ Identifies the meaning of the denominator as the number of equal-sized partitions in the whole. ___ Identifies the meaning of the numerator as the number of indicated pieces. ___ States that only the whole number of pieces shown, rather than the fractional amount, is represented. ( <i>inaccurate</i> )	<b>Makes use of the meanings of the numerator and denominator.</b> ___ Identifies that the denominator determines the number of partitions in the whole. ___ Identifies that the numerator determines the number of partitions indicated. ___ Represents incorrect number of partitions. ( <i>inaccurate</i> ) ___ Represents unequal partitions. ( <i>inaccurate</i> )	<b>Recognizes equivalence.</b> ___ States or shows two equal size wholes for each equivalent fraction. ___ Identifies the fractions with the same amount of area or the same point on the number line. ___ Identifies when visual models of fractions are equivalent. ___ Looks solely at the numerators or denominators and identifies the fraction based on the magnitude of the numerator with the greatest number (e.g., $\frac{3}{8}$ is greater than $\frac{1}{2}$ because 3 is greater than 1 and 8 is greater than 2). ( <i>inaccurate</i> )	<b>Comparisons with common denominators or numerators</b> ___ Identifies that the larger fraction of two fractions with like denominators is the one with the largest numerator. ___ Identifies that the larger fraction of two fractions with common numerators and unlike denominators is the one with the smallest denominator because the pieces are greater. ___ Identifies that the largest non-unit fraction is the one with the greatest denominator. ( <i>inaccurate</i> )  <b>Comparisons with unlike denominators</b> ___ Compares fractions to benchmarks of $\frac{1}{2}$ , $\frac{1}{4}$ , and 1. ___ Finds common numerators or denominators.
Provides Explanation	<b>Relates the written fraction to the visual model.</b> ___ Explains that the denominator represents the number of pieces in the whole in the visual model and the numerator represents the shaded pieces in the visual model.	<b>Relates the visual model to the written fraction.</b> ___ Explains that the denominator represents the number of pieces in the whole in the visual model and the numerator represents the shaded pieces in the visual model.	<b>Constructs a viable argument.</b> ___ Identifies that two of the fractions are equivalent. ___ Justifies the equivalence of the two fractions by indicating via a visual model that the pieces cover the same amount of space. ___ Justifies the equivalence of the two fractions through the use of the equation $\frac{a}{b} \times \frac{n}{n} = \frac{an}{bn}$ .	<b>Comparisons with common denominators or numerators</b> ___ Justifies the larger fraction as having the greatest amount because of the greater numerator/denominator.  <b>Comparison with unlike denominators</b> ___ Justifies the larger fraction via models, benchmarks, or equivalency.

**Category II: Adds and Subtracts Fractions**

<b>Category II</b>	<b>Models Mathematics</b>	<p><b>5. Adds/Subtracts Fractions with Common Denominators</b></p> <p>Calculates <math>\frac{2}{8} + \frac{4}{8}</math> and <math>\frac{3}{6} - \frac{2}{6}</math>; Solves word problems involving <math>\frac{2}{4} + \frac{1}{4}</math> and <math>\frac{5}{6} - \frac{2}{6}</math>.</p>	<p><b>6. Adds/Subtracts Fractions with Unlike Denominators</b></p> <p>Calculates <math>\frac{2}{5} + \frac{3}{4}</math>. Solves word problems involving <math>\frac{3}{4} - \frac{3}{8}</math> and <math>\frac{7}{8} - \frac{3}{4}</math>.</p>
	<b>Understands Structure of</b>	<p><b>Models addition and subtraction of fractions with common denominators.</b></p> <p>___ Draws diagram or number line model that matches the equation.          ___ Writes equation that accurately models the word problem.</p>	<p><b>Models addition and subtraction of fractions with unlike denominators.</b></p> <p>___ Draws diagram or number line model that matches the equation.          ___ Writes equation that accurately models the word problem.</p>
	<b>Provides Explanation</b>	<p><b>Recognizes structure of addition and subtraction of fractions with common denominators.</b></p> <p>___ Adds/Subtracts both the numerators and the denominators, instead of only adding or subtracting the numerator of fractions with common denominators. <i>(inaccurate)</i>          ___ Adds and determines the sum of fractions with like denominators.          ___ Subtracts and determines the difference of fractions with like denominators.          ___ Chooses incorrect operation/solution path. <i>(inaccurate)</i></p>	<p><b>Recognizes structure of addition and subtraction of fractions with unlike denominators.</b></p> <p>___ Adds/Subtracts both the numerators and the denominators, instead of only working with the numerator of fractions with unlike denominators. <i>(inaccurate)</i>          ___ Adds fractions and determines the sum of with unlike denominators.          ___ Subtracts and determines the difference of fractions with unlike denominators.          ___ Chooses incorrect operation/solution path. <i>(inaccurate)</i></p>
	<b>Provides Explanation</b>	<p><b>Articulates reason for having same-sized pieces when adding or subtracting fractions.</b></p> <p>___ Articulates that because the size of the pieces are the same, it is only necessary for the numerators to be added/subtracted.</p>	<p><b>Articulates reason for having same-sized pieces when adding or subtracting fractions</b></p> <p>___ States the need for or changes denominators to pieces of like size in order to add or subtract.</p>

**Category III: Multiplies and Divides Fractions**

<b>Category III</b>	<b>Mathematics</b>	<p><b>7. Multiplies a Whole Number by a Fraction</b></p> <p><i>Calculates <math>5 \times \frac{1}{2}</math>; Solves word problems involving <math>\frac{3}{4} \times 3</math> and <math>\frac{2}{3}</math> of 5.</i></p>	<p><b>8. Multiplies a Fraction by a Fraction</b></p> <p><i>Calculates <math>\frac{1}{2} \times \frac{2}{3}</math>, <math>\frac{4}{5} \times \frac{3}{4}</math>; Solves word problems involving <math>\frac{3}{4}</math> of <math>\frac{2}{3}</math>.</i></p>	<p><b>9. Divides with a Fraction</b></p> <p><i>Solves <math>1 \div \frac{1}{5}</math>, <math>3 \div \frac{1}{5}</math>, and <math>\frac{1}{5} \div 3</math>.</i></p>	<p><b>10. Divides with Two Fractions</b></p> <p><i>Solves <math>\frac{1}{4} \div \frac{2}{3}</math>.</i></p>
	<b>Understands Structure of Operating with Fractions</b>	<p><b>Models multiplication of a fraction by a whole number.</b></p> <ul style="list-style-type: none"> <li>___ Represents the situation with a visual model.</li> <li>___ Represents the word problems with equations.</li> </ul>	<p><b>Models multiplication of a fraction by a fraction.</b></p> <ul style="list-style-type: none"> <li>___ Represents the situation with a visual model.</li> <li>___ Represents the word problems with equations.</li> </ul>	<p><b>Models division of a whole number by a unit fraction.</b></p> <ul style="list-style-type: none"> <li>___ Represents the whole number, showing how many of the unit fractions are housed within the whole.</li> </ul> <p><b>Models division of a unit fraction by a whole number.</b></p> <ul style="list-style-type: none"> <li>___ Represents the unit fractions divided into equal groups, as indicated by the whole number.</li> <li>___ Represents each of the unit fractions in one whole, each divided by the whole.</li> </ul>	<p><b>Models division of a fraction by a fraction.</b></p> <ul style="list-style-type: none"> <li>___ Represents the dividend of <math>\frac{1}{4}</math>.</li> <li>___ Represents the divisor of <math>\frac{2}{3}</math>.</li> <li>___ Shows that only <math>\frac{3}{8}</math> of <math>\frac{2}{3}</math> fits into <math>\frac{1}{4}</math>.</li> </ul>
	<b>Provides Explanation</b>	<p><b>Recognizes the structure of multiplying with a fractional factor.</b></p> <ul style="list-style-type: none"> <li>___ Uses repeated addition of the fraction to determine the product.</li> <li>___ Uses multiplication to multiply the numerator by the whole number to arrive at the product.</li> <li>___ Determines a fraction of the whole amount by partitioning the whole based on the denominator.</li> <li>___ Multiplies both the numerator and the denominator by the whole number. (<i>inaccurate</i>)</li> </ul>	<p><b>Recognizes the structure of multiplying with two fractional factors.</b></p> <ul style="list-style-type: none"> <li>___ Determines a portion of a fractional amount by the denominator of the other factor on a visual model.</li> <li>___ Multiplies the numerators and multiplies the denominators.</li> <li>___ Does not partition one factor by the denominator of the other factor.</li> <li>___ Multiplies only the numerators or only the denominators; finds a common denominator.</li> </ul>	<p><b>Divides a whole number by a unit fraction.</b></p> <ul style="list-style-type: none"> <li>___ Divides a whole number by a unit fraction and recognizes that the quotient is the number of times the unit fraction fits into the whole number.</li> <li>___ Divides the numerators and the denominators (if putting the whole number over 1).</li> <li>___ Inverts the second fraction and multiplies by the whole number.</li> <li>___ Misnames the quotient by not considering the size of the final piece in relation to the whole (i.e., determines the answer is <math>\frac{1}{3}</math> instead of counting how many one-thirds are in 5; model/explanation is correct conceptually).</li> </ul> <p><b>Divides a unit fraction by a whole number.</b></p> <ul style="list-style-type: none"> <li>___ Divides a unit fraction by a whole number and recognizes that each of the unit fractions must be divided by the whole number in order to determine the magnitude of the quotient.</li> <li>___ Divides the numerators and denominators (if putting the whole number over 1).</li> <li>___ Inverts the second fraction and multiplies by the unit fraction.</li> <li>___ Misnames the quotient by not considering the size of the final piece in relation to the whole (i.e., determines the answer is <math>\frac{1}{3}</math> instead of counting how many one-thirds are in 5; model/explanation is correct conceptually).</li> </ul>	<p><b>Divides a fraction by a fraction.</b></p> <ul style="list-style-type: none"> <li>___ Divides a fraction by a fraction and recognizes that because the question is asking how much of <math>\frac{2}{3}</math> fits in <math>\frac{1}{4}</math>, the quotient will be less than <math>\frac{2}{3}</math>.</li> <li>___ Inverts the second fraction and multiplies by the first fraction.</li> <li>___ Misnames the quotient by not considering the size of the final piece in relation to the whole.</li> </ul>
	<b>Provides Explanation</b>	<p><b>Relates the diagram to the equation or story problem.</b></p> <ul style="list-style-type: none"> <li>___ Multiplicative language indicates understanding of groups and amount in the group.</li> </ul>	<p><b>Relates the diagram to the equation or story problem.</b></p> <ul style="list-style-type: none"> <li>___ Multiplicative language indicates understanding of less than one whole group and amount in the group.</li> </ul>	<p><b>Relates the diagram to the equation (divides a whole number by a unit fraction).</b></p> <ul style="list-style-type: none"> <li>___ Articulates that the whole number must be divided by the unit fraction, and states that the quotient is the number of times the unit fraction fits into the whole number.</li> </ul> <p><b>Relates the diagram to the equation (divides a unit fraction by a whole number).</b></p> <ul style="list-style-type: none"> <li>___ Identifies that the unit fraction must be divided by the whole number and states that each of the unit fractions must be divided by the whole number in order to determine the magnitude of the quotient.</li> </ul>	<p><b>Relates the diagram to the equation (divides a fraction by a fraction).</b></p> <ul style="list-style-type: none"> <li>___ Articulates that a fraction divided by a fraction means that the number of times the divisor fits inside the dividend needs to be determined.</li> </ul>