

4 Units
18 Lessons
4 Fractions ExplorActions (Labs)

Unit / Lesson / Lab	Grade 4 Lesson Objective	CCSS	Manipulative(s)	Description
Unit 1: Equivalent Fractions and Decimals				
Lesson 1	Recognize equivalent fractions a/b and $(n \times a)/(n \times b)$ by identifying n .	4.NF.A.1	Fraction Towers	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
Lesson 2	Find equivalent fractions in simplest terms.	4.NF.A.1	Fraction Towers	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
Lesson 3	Convert between improper fractions and mixed numbers.	4.NF.B.3b	Fraction Squares	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.
Lesson 4	Use decimal notation to express fractions with denominators of 10 and 100.	4.NF.C.6	Base Ten Blocks Fraction Squares	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
Fractions ExplorAction 1 (Lab)	Decompose fractions into sums.	4.NF.B.3b	Cuisenaire Rods	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.
Unit 2: Compare and Order Fractions				
Lesson 1	Compare two fractions by creating common denominators.	4.NF.A.2	Cuisenaire Rods	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
Lesson 2	Compare two fractions by creating common numerators.	4.NF.A.2	Fraction Circles	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
Lesson 3	Compare two fractions by comparing them to a benchmark.	4.NF.A.2	Fraction Towers Fraction Number Line (blank line)	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
Lesson 4	Compare decimals to hundredths.	4.NF.C.7	Base Ten Blocks	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.

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Fractions ExplorAction 1 (Lab)	Investigate the effect of changing the numerator or denominator of a fraction.	4.NF.A.2	Fraction Circles	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
Unit 3: Add and Subtract Fractions				
Lesson 1	Add two proper fractions (same denominator, sum is proper fraction).	4.NF.B.3a	Fraction Circles	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
Lesson 2	Add two proper fractions (same denominator, sum is improper fraction).	4.NF.B.3a	Fraction Towers	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
Lesson 3	Subtract one proper fraction from another (same denominator).	4.NF.B.3a	Fraction Circles	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
Lesson 4	Add two mixed numbers (same denominator).	4.NF.B.3c	Fraction Towers Fraction Number Line (blank line)	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
Lesson 5	Subtract one mixed number from another (same denominator).	4.NF.B.3c	Fraction Towers Fraction Number Line (blank line)	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
Lesson 6	Add two fractions with respective denominators 10 and 100.	4.NF.C.5	Base Ten Blocks	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.
Fractions ExplorAction 1 (Lab)	Investigate addition and subtraction with fractions using area models and number lines.	4.NF.B.3a	Fraction Towers Fraction Number Line (tick-marked double line)	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
Lesson 7	Solve word problems involving addition and subtraction of fractions.	4.NF.B.3d	Fraction Circles	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
Unit 4: Multiply Fractions				
Lesson 1	Multiply a unit fraction by a whole number (product is proper or improper).	4.NF.B.4a	Fraction Circles	Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. For example, use a visual fraction model to represent $\frac{5}{4}$ as the product $5 \times (\frac{1}{4})$, recording the conclusion by the equation $\frac{5}{4} = 5 \times (\frac{1}{4})$.
Lesson 2	Multiply a proper fraction by a whole number (product is proper or improper).	4.NF.B.4b	Fraction Towers Fraction Number Line (tick-marked double line)	Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (\frac{2}{5})$ as $6 \times (\frac{1}{5})$, recognizing this product as $\frac{6}{5}$. (In general, $n \times (\frac{a}{b}) = (n \times a)/b$.)

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Fractions ExplorAction 1 (Lab)	Investigate multiplication of a fraction by a whole number using area models and number lines.	4.NF.B.4a	Fraction Towers Fraction Number Line (blank line) Fraction Squares	Understand a fraction a/b as a multiple of $1/b$. For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.
Fractions ExplorAction 1 (Lab)	Investigate multiplication of a fraction by a whole number using area models and number lines.	4.NF.B.4b	Fraction Towers Fraction Number Line (blank line) Fraction Squares	Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)
Lesson 3	Solve word problems involving multiplication of a fraction by a whole number.	4.NF.B.4c	Fraction Circles Fraction Squares Fraction Towers	Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?