EUREKA MATH® TEKS EDITION

TIPS FOR FAMILIES

KEY CONCEPT OVERVIEW

In Lessons 1 through 5, students explore fraction equivalence. They show how fractions can be expressed as the sum of smaller fractions by using different models.

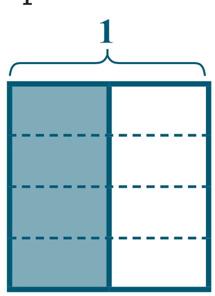
You can expect to see homework that asks your child to do the following:

- **Decompose** fractions as a sum of **unit fractions** (e.g., $\frac{3}{4}=\frac{1}{4}+\frac{1}{4}+\frac{1}{4}$).
- Draw and label **strip diagrams** to show decomposition of a fraction and to prove that two fractions are equivalent.
- Draw **area models** to show decomposition and to find equivalent fractions.

SAMPLE PROBLEM *(From Lesson 4)*

Draw an area model to show the decomposition represented by the **number sentence** below. Represent the decomposition as a sum of unit fractions.

$\frac{1}{2}=\frac{4}{8}$



$$\frac{1}{2}=\frac{1}{8}+\frac{1}{8}+\frac{1}{8}+\frac{1}{8}=\frac{4}{8}$$

HOW YOU CAN HELP AT HOME

- Explore fractions as you make sandwiches. Give a sandwich to your child. Ask her how many whole sandwiches she has. Cut your child's sandwich in half. Ask her again how many whole sandwiches she has. Point to one half. Ask her to say the fraction that the piece represents. Point to the other half. Ask her again to say the fraction. Finally, ask her to say a number sentence that represents the decomposition $(1=\frac{1}{2}+\frac{1}{2})$. Continue with this activity by decomposing the halves into smaller units (e.g., fourths, eighths).

HOW YOU CAN HELP AT HOME
(continued)

- Use measuring cups to show equivalence. Measure $\frac{2}{3}$ cup of water. Give your child the water and a $\frac{1}{3}$-cup measuring cup. Ask him how many times he will be able to fill the $\frac{1}{3}$-cup measuring cup with the water. Prompt him to prove it and then to say the decomposition in a number sentence (e.g., $\frac{2}{3}=\frac{1}{3}+\frac{1}{3}$).

TERMS

Decompose/Decomposition: To break apart into smaller parts. There are multiple ways to show decomposition. For example, write $1=\frac{1}{5}+\frac{1}{5}+\frac{1}{5}+\frac{1}{5}+\frac{1}{5}$ or $1=\frac{2}{5}+\frac{2}{5}+\frac{1}{5}$, or partition a strip diagram into smaller parts to show equivalence, such as partitioning 1 whole into 5 fifths.

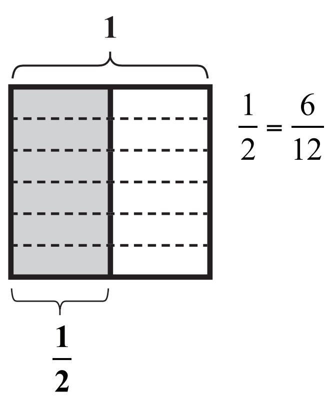
Equivalent: Names the same amount. For example, $\frac{2}{3}$ is equivalent to $\frac{1}{3}+\frac{1}{3}$.

Number sentence: An equation for which both expressions are numerical and can be evaluated to a single number. For example, $\frac{1}{4}+\frac{1}{4}=\frac{2}{4}$ and $\frac{1}{10}+\frac{2}{10}+\frac{3}{10}=\frac{6}{10}$ are number sentences. Number sentences do not have unknowns.

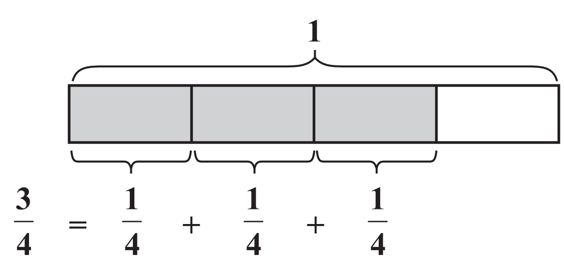
Unit fraction: A fraction with a numerator of 1. For example, $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ are all unit fractions.

MODELS

Area Model



Strip Diagram



TIPS FOR FAMILIES

KEY CONCEPT OVERVIEW

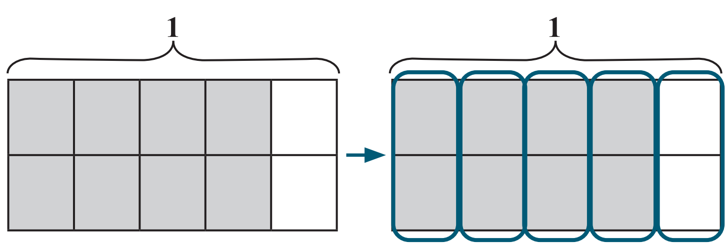
In Lessons 6 through 10, students explore **equivalent** fractions by using multiplication and division. To explain how fractions can be equivalent, students use **area models** and the **number line**.

You can expect to see homework that asks your child to do the following:

- Express equivalent fractions in a **number sentence** by using multiplication (e.g., $\frac{1}{5} = \frac{1 \times 2}{5 \times 2} = \frac{2}{10}$).
- Express equivalent fractions in a number sentence by using division (e.g., $\frac{2}{10} = \frac{2 \div 2}{10 \div 2} = \frac{1}{5}$).
- Draw area models to represent number sentences and to prove fractions are equivalent.
- Draw number lines to show equivalence.

SAMPLE PROBLEM *(From Lesson 8)*

Compose the shaded fraction into larger **fractional units**. Express the equivalent fractions in a number sentence by using division.



$$\frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5}$$

HOW YOU CAN HELP AT HOME

- With your child, take turns drawing area models, such as the one above, and shading a fraction of each. After you have drawn and shaded each area model, work together to determine whether you can compose the fraction into larger units.
- Challenge your child to think about common **factors**. Write a fraction such as $\frac{4}{10}$. Ask your child to name the factors of 4 (1, 2, 4) and the factors of 10 (1, 2, 5, 10), and then ask him to name the common factors (1 and 2). Continue with other fractions.

TERMS

Compose: To change a smaller unit for an equivalent larger unit (e.g., convert fourths to halves: $\frac{2}{4} = \frac{1}{2}$).

Decompose: To break apart into smaller parts (e.g., partition a strip diagram equally into smaller parts to show equivalence).

Equivalent: Identifies the same amount. For example, $\frac{3}{4}$ is equivalent to $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$.

Factor: A number that is multiplied by another number. For example, in $3 \times 4 = 12$, the numbers 3 and 4 are factors; therefore, 3 and 4 are factors of 12.

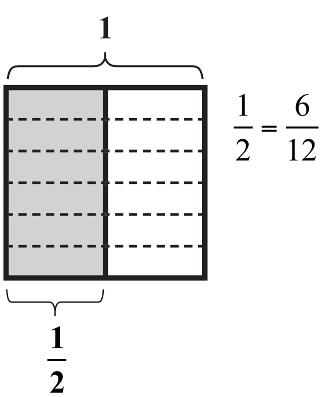
Fractional units: The result of dividing a unit into parts. For example, halves, thirds, and fourths are fractional units.

Number sentence: An equation for which both expressions are numerical and can be evaluated to a single number. For example, $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$ and $\frac{1}{10} + \frac{2}{10} + \frac{3}{10} = \frac{6}{10}$ are number sentences. Number sentences do not have unknowns.

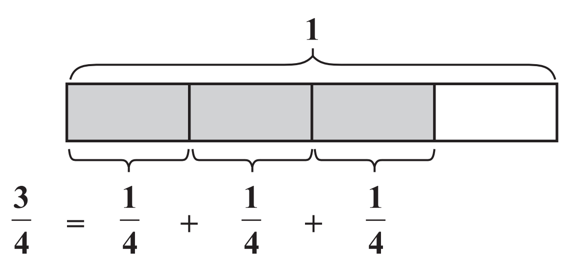
Unit fraction: A fraction with a numerator of 1. For example, $\frac{1}{2}, \frac{1}{3}$, and $\frac{1}{4}$ are all unit fractions.

MODELS

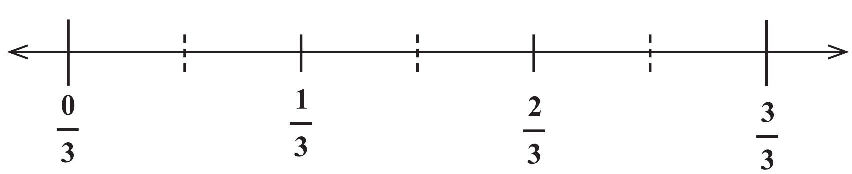
Area Model



Strip Diagram



Number Line



TIPS FOR FAMILIES

KEY CONCEPT OVERVIEW

In Lessons 11 through 14, students compare fractions by using different models (e.g., **number line, area model**) and strategies.

You can expect to see homework that asks your child to do the following:

- Plot fractions on a number line and use the number line to compare fractions.
- Compare fractions by referring to **benchmarks**. (See Sample Problem.)
- Compare fractions by thinking about the size of the unit (e.g., thirds are larger than sixths, so $\frac{1}{3} > \frac{1}{6}$).
- Compare fractions with common and related **numerators** (e.g., fifths are larger than eighths; there are three of each unit, so $\frac{3}{5} > \frac{3}{8}$).
- Compare fractions with common and related **denominators** (e.g., $\frac{1}{3}$ is equivalent to $\frac{2}{6}$, so $\frac{1}{3} < \frac{3}{6}$).

SAMPLE PROBLEM *(From Lesson 11)*

Compare the fractions below by writing > or < on the line. Give a brief explanation for the answer, referring to one or more of the benchmarks 0, $\frac{1}{2}$, and 1.

$\frac{2}{3}$ <u><</u> $\frac{7}{8}$

$\frac{2}{3}$ is one-third from 1. $\frac{7}{8}$ is one-eighth from 1. Thirds are larger than eighths, meaning that $\frac{2}{3}$ is farther from 1 than $\frac{7}{8}$ is from 1, so $\frac{2}{3} < \frac{7}{8}$.

HOW YOU CAN HELP AT HOME

Play the Fraction Number Battle game.

1. Remove the jacks, queens, kings, and jokers from a deck of cards. Let aces hold a value of 1. Decide how long you will play the game. Set a timer. *If playing cards are not available, the game may be played by writing the digits 1-9, four times each, on small pieces of paper.*
2. Divide the cards evenly between two players. Each player puts their cards facedown in a pile.
3. Each player picks two cards off the top of their pile, places them face up in the playing area, and arranges the cards as a fraction with the smaller number as the numerator.

HOW YOU CAN HELP AT HOME
(continued)

4. Each player calls out the value of their fraction. The player whose fraction has the greater value takes all of the cards played and places them at the bottom of their pile. If the fractions have an equal value, each player places three cards facedown in the playing area, followed by a new pair of cards face up, forming a new fraction with the cards. The player whose new fraction has the greater value gets all of the cards in the playing area.
5. Continue until one player wins by getting all of the cards. If time runs out first, the player with the most cards wins.

To LEARN MORE by viewing complete directions and other card game ideas, visit *greatminds.org/math/games.*

TERMS

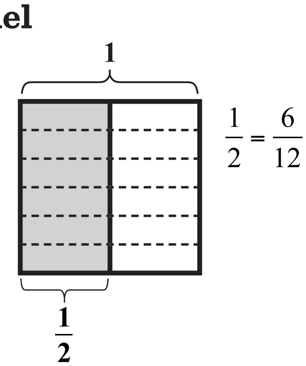
Benchmark: A reference point by which something is measured. The numbers 0, $\frac{1}{2}$, and 1 are benchmarks that can be used to help compare fractions. For example, $\frac{3}{8}$ is less than $\frac{1}{2}$, and $\frac{4}{6}$ is greater than $\frac{1}{2}$; therefore, $\frac{3}{8}$ is less than $\frac{4}{6}$.

Denominator: Denotes the fractional unit (the bottom number in a fraction). For example, *fifths* in three-fifths, as represented by the 5 in $\frac{3}{5}$, is the denominator.

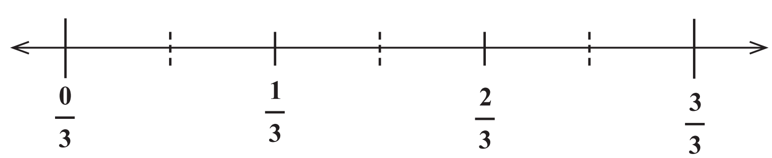
Numerator: Denotes the count of fractional units (the top number in a fraction). For example, *three* in three-fifths, or 3 in $\frac{3}{5}$, is the numerator.

MODELS

Area Model



Number Line



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TIPS FOR FAMILIES

KEY CONCEPT OVERVIEW

In Lessons 15 through 18, students add and subtract fractions. They use **number bonds**, **number lines**, and **strip diagrams**, as needed, to model the addition and subtraction. Students apply what they have learned to solve word problems.

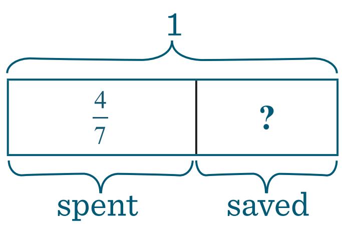
You can expect to see homework that asks your child to do the following:

- Add and subtract fractions with like units (e.g., $\frac{3}{6}+\frac{2}{6}$).
- Record answers as **mixed numbers**, where applicable (e.g., $\frac{11}{8} = 1\frac{3}{8}$).
- Use the **RDW process** to solve word problems.

SAMPLE PROBLEM *(From Lesson 18)*

Use the RDW process to solve a word problem subtracting a fraction from 1.

Maria spent $\frac{4}{7}$ of her money on a book and saved the rest. What fraction of her money did Maria save?



Maria saved $\frac{3}{7}$ of her money.

Solution 1

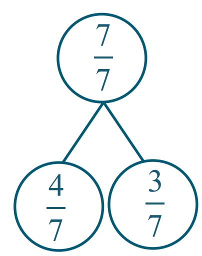
$$1-\frac{4}{7}=\frac{7}{7}-\frac{4}{7}=\frac{3}{7}$$

Solution 2

$$\frac{4}{7}+x=1$$

$$\frac{4}{7}+\frac{3}{7}=\frac{7}{7}$$

$$x=\frac{3}{7}$$



HOW YOU CAN HELP AT HOME

- Ask your child to teach you how to add and subtract fractions. Teaching you will help them to explain their thinking as they talk through the process. Ask your child to explain how the models (the number bond, number line, and strip diagram) can help them solve.
- Together, find one of your child's favorite recipes. Look at the amount needed for each ingredient. Pose the following questions: What happens if we want to make two batches of the recipe instead of one? How much of each ingredient will we need?

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TERMS

Decompose/Decomposition: To break apart into smaller parts. There are multiple ways to show decomposition, for example, $1\frac{3}{6}=\frac{6}{6}+\frac{3}{6}$, or $\frac{9}{6}=\frac{6}{6}+\frac{3}{6}$, or partitioning a strip diagram to make like units. (See Sample Problem.)

Mixed number: A number made up of a whole number and a fraction, for example, $1\frac{2}{3}$.

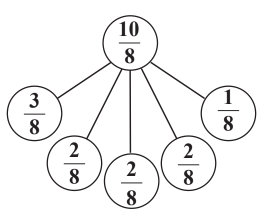
Number sentence: An equation for which both expressions are numerical and can be evaluated to a single number. For example, $\frac{1}{4}+\frac{1}{4}=\frac{2}{4}$ and $\frac{1}{10}+\frac{2}{10}+\frac{3}{10}=\frac{6}{10}$ are number sentences. Number sentences do not have unknowns.

RDW process: Read, Draw, Write is a three-step process used in solving word problems that requires students to read the problem for understanding, draw a model (e.g., a strip diagram) to help make sense of the problem, and write an equation and a statement of the answer.

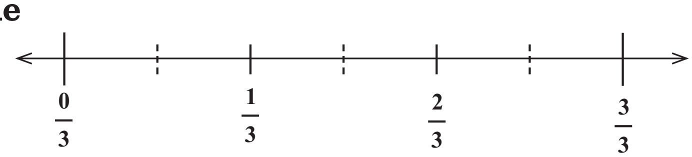
Unit form: A number expressed in terms of its units. For example, $\frac{15}{100}$ written in unit form is 1 tenth 5 hundredths or 15 hundredths.

MODELS

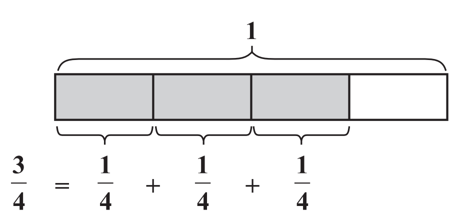
Number Bond



Number Line



Strip Diagram



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TIPS FOR FAMILIES

KEY CONCEPT OVERVIEW

In Lessons 19 through 24, students work with **fractions greater than 1**.

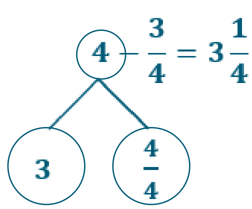
You can expect to see homework that asks your child to do the following:

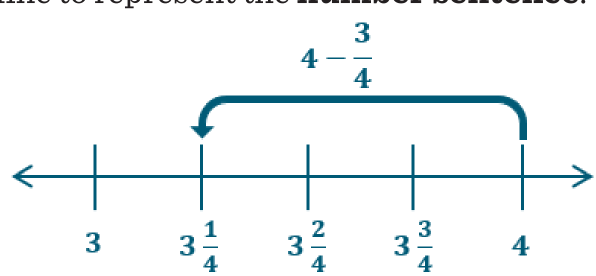
- Add fractions to whole numbers and subtract fractions from whole numbers.
- Use strip diagrams, number bonds, number lines, **benchmarks**, and area models to add, subtract, and compare fractions.
- Multiply whole numbers by **unit fractions**.
- Convert fractions greater than 1 to **mixed numbers**.
- Convert mixed numbers to fractions greater than 1.
- Compare fractions by using <, >, or =.
- Create a **dot plot** and solve problems related to its data.
- Use the distributive property to multiply a whole number by a mixed number.

SAMPLE PROBLEM *(From Lesson 19)*

Solve by using a number bond. Draw a number line to represent the **number sentence**.

$4 - \frac{3}{4} = \underline{3\frac{1}{4}}$





HOW YOU CAN HELP AT HOME

- Practice renaming whole numbers as a whole number and a fraction (e.g., 5 as $4\frac{4}{4}$). This will help your child when tasked with subtracting a fraction from a whole number.
- Find 6 pencils of different lengths. Help your child to measure each pencil to the nearest quarter inch, and then record the measurements. Next, ask them to use the data to create a dot plot (similar to the example on the following page), and then to create two questions based on the data.

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TERMS

Benchmark: A reference point by which something is measured. The numbers 0, $\frac{1}{2}$, and 1 are benchmarks that can be used to help compare fractions. For example, $\frac{3}{8}$ is less than $\frac{1}{2}$, and $\frac{4}{6}$ is greater than $\frac{1}{2}$; therefore, $\frac{3}{8}$ is less than $\frac{4}{6}$.

Decompose/Decomposition: To break apart into smaller parts. There are many ways to show decomposition, for example, $4 = 3 + \frac{3}{3}$ or $\frac{11}{3} = \frac{9}{3} + \frac{2}{3}$ or $2\frac{2}{3} = 1\frac{2}{3} + 1$.

Fraction greater than 1: A fraction with a numerator that is greater than the denominator. For example, $\frac{5}{4}$ is a fraction greater than 1.

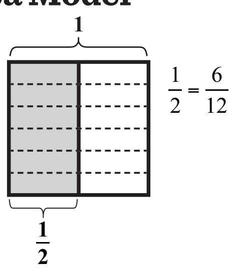
Mixed number: A number made up of a whole number and a fraction (e.g., $1\frac{2}{3}$).

Number sentence: An equation for which both expressions are numerical and can be evaluated to a single number. For example, $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$ and $\frac{1}{10} + \frac{2}{10} + \frac{3}{10} = \frac{6}{10}$ are number sentences. Number sentences do not have unknowns.

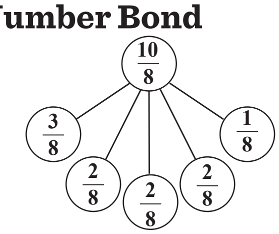
Unit fraction: A fraction with a numerator of 1. For example, $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ are all unit fractions.

MODELS

Area Model

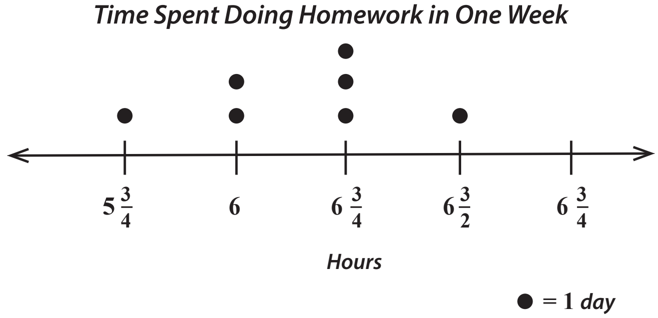


Number Bond

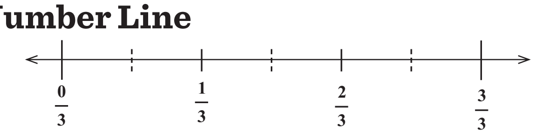


Dot Plot

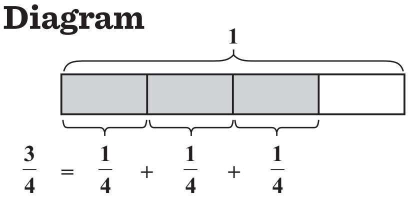
Time Spent Doing Homework in One Week



Number Line



Strip Diagram



TIPS FOR FAMILIES

KEY CONCEPT OVERVIEW

In Lessons 25 through 31, students add and subtract fractions and mixed numbers by using different strategies.

You can expect to see homework that asks your child to do the following:

- Estimate the sum or difference of two mixed numbers (e.g., $2\frac{1}{12} + 1\frac{7}{8} \approx 4$).
- Add a mixed number and a fraction (e.g., $2\frac{1}{5} + \frac{4}{5}$).
- Add mixed numbers (e.g., $2\frac{2}{3} + 1\frac{2}{3}$).
- Subtract a fraction from a mixed number (e.g., $3\frac{4}{6} - \frac{5}{6}$).
- Subtract mixed numbers (e.g., $5\frac{3}{10} - 4\frac{7}{10}$).
- Use the distributive property to multiply a whole number by a mixed number.
  (e.g., $4 \times 6\frac{2}{3} = (4 \times 6) + \left(4 \times \frac{2}{3}\right)$)

SAMPLE PROBLEM *(From Lesson 30)*

Solve by using any strategy.
NOTE: The strategy used here to solve this problem, decompose the total, is just one possible strategy. Other strategies include the **arrow way** or using different number bonds/decomposition.

$7\frac{3}{8} - 4\frac{5}{8}$

$$7\frac{3}{8} - 4\frac{5}{8} = 6\frac{11}{8} - 4\frac{5}{8} = 2\frac{6}{8} \text{ or } 2\frac{3}{4}$$

6 $\quad \frac{11}{8}$

HOW YOU CAN HELP AT HOME

- Ask your child to teach you the strategy she most prefers for adding and subtracting fractions. Ask her to explain why she thinks it's better than other strategies.
- Practice decomposing, or taking apart, a mixed number. Write a mixed number on a piece of paper. Prompt your child to take one from the total, rename it in fractional form, and then add it to the mixed number that remains (e.g., $5\frac{3}{5} = 4\frac{3}{5} + \frac{5}{5} = 4\frac{8}{5}$). Decompositions such as this help students with the strategy of decomposing the total before subtracting (e.g., $5\frac{3}{5} - \frac{4}{5} = 4\frac{8}{5} - \frac{4}{5} = 4\frac{4}{5}$).

MODELS

Arrow Way

$$4\frac{1}{5} - 2\frac{4}{5} = 1\frac{2}{5}$$

$$4\frac{1}{5} \xrightarrow{-2} 2\frac{1}{5} \xrightarrow{-\frac{4}{5}} 1\frac{2}{5}$$