3–1 Class Activity

Name _____ Date _____

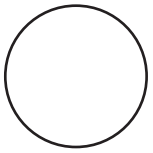
▶ Parts and Wholes

1. The head is what fraction of the whole worm?

_____

2. Draw a worm whose head is $\frac{1}{7}$ of the whole.

3. Divide this circle into fourths. Shade $\frac{1}{4}$.



4. This triangle is $\frac{1}{2}$. Make the whole.

5. This donut is $\frac{1}{6}$ of the group. Draw the rest of the group of donuts.

6. This is 1 whole group. Circle $\frac{2}{5}$ of the group.

7. What fraction of all your fingers are your 2 thumbs?

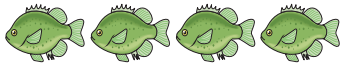
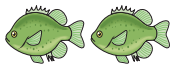
_____

8. What fraction of the apples was eaten?

_____

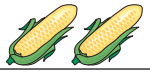
9. What fraction of the fish did Alta catch?

_____

Dave	
Alta	
Brent	
Stacy	

10. What fraction of the corn did Yuet eat?

_____

Yuet	
Mike	
Vasco	
Gracia	

11. Tim ate $\frac{2}{5}$ of the grapes, and Kate ate $\frac{1}{5}$. What fraction of the grapes did they eat altogether?

_____

12. Camila made 5 paper chain links and Mito made 4. What fraction of a 20-link chain have they made so far?

_____

3–1 Class Activity

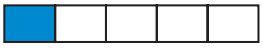
Name _____ Date _____

Vocabulary
unit fraction
non-unit fraction

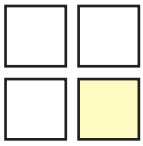
▶ Practice with Fractions

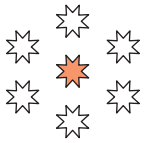
A **unit fraction** is one equal part of a whole. A **non-unit fraction** is built from two or more unit fractions.

What unit fraction does each shaded area show?

13. 

14. 

15. 

16. 

_____ _____ _____ _____

17. Circle the non-unit fractions.

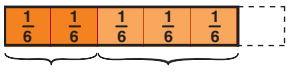
$\frac{1}{6}$	$\frac{2}{7}$	$\frac{1}{9}$	$\frac{3}{10}$	$\frac{5}{6}$	$\frac{1}{12}$	$\frac{1}{8}$

Circle enough unit fractions to make the non-unit fraction:

18. Make $\frac{2}{7}$. $\frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{7}{7}$

19. Make $\frac{4}{5}$. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{5}{5}$

To add fractions you put together fractions that are made of the same unit fraction.



$\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$

2 sixths + 3 sixths = 5 sixths

2 ones + 3 ones = 5 ones

20. How is adding fractions like adding whole numbers?

_____

_____

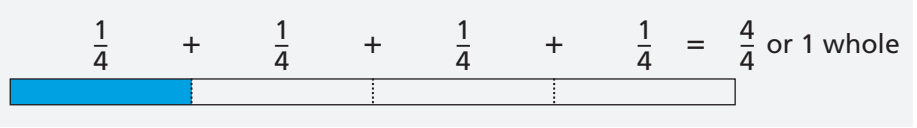
How is it different?

_____

_____

Dear Family:

Your child is learning about fraction concepts. Using fraction bars, students learn about unit fractions, or fractions that are just one part of the whole, such as $\frac{1}{2}$ or $\frac{1}{4}$.



Non-unit fractions are sums of unit fractions.

$\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$

Unit fractions are used to convert mixed numbers, which have a whole-number part and a fractional part, to improper fractions, where the top number (numerator) is larger than the bottom number (denominator).

$2\frac{1}{4} = \frac{4}{4} + \frac{4}{4} + \frac{1}{4} = \frac{9}{4}$

Fraction bars help students understand how to compare, add, and subtract fractions with like denominators: 3\7

$\frac{a}{d} + \frac{b}{d} = \frac{a+b}{d}$

$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

$\frac{a}{d} - \frac{b}{d} = \frac{a-b}{d}$

$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$

If $a > b$, then

$\frac{1}{a} < \frac{1}{b}$ and $\frac{a}{d} > \frac{b}{d}$

$\frac{1}{3} < \frac{1}{2}$ and $\frac{3}{7} > \frac{2}{7}$

These skills extend to fractions with unlike denominators. We rewrite each fraction with a common denominator, using multiplication to make an equivalent fraction.

$\frac{1}{3} \xrightarrow{\times 5} \frac{5}{15} \xleftarrow{\times 5}$

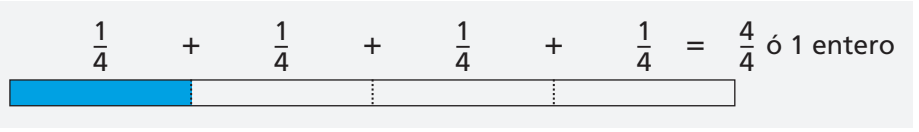
We add and subtract mixed numbers by treating the whole-number part and the fractional part separately, ungrouping 1 whole, if needed.

$$\begin{array}{rcl} 4\frac{1}{3} & = & 3\frac{20}{15} \\ -\ 2\frac{7}{15} & = & 2\frac{7}{15} \\ \hline & & 1\frac{13}{15} \end{array}$$

Sincerely,
Your child's teacher

Estimada familia:

Su niño está aprendiendo conceptos de fracciones. Al usar barras de fracciones, los estudiantes aprenden acerca de fracciones cuyo numerador es uno es decir, fracciones que son una parte del entero, como $\frac{1}{2}$ ó $\frac{1}{4}$.



Las fracciones cuyo numerador es diferente de uno son sumas de fracciones cuyo numerador es uno.

$$\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$$

Las fracciones cuyo numerador es uno se usan para convertir números mixtos, los cuales tienen una parte formada por un número entero y una parte fraccionaria, a fracciones impropias, donde el número de arriba (numerador) es mayor que el número de abajo (denominador).

$$2\frac{1}{4} = \frac{4}{4} + \frac{4}{4} + \frac{1}{4} = \frac{9}{4}$$

Las barras de fracciones ayudan a los estudiantes a comprender cómo se comparan, se suman y se restan las fracciones con denominadores iguales:

$$\frac{a}{d} + \frac{b}{d} = \frac{a+b}{d}$$

$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$

$$\frac{a}{d} - \frac{b}{d} = \frac{a-b}{d}$$

$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$$

$a > b$ así que

$$\frac{1}{a} < \frac{1}{b} \text{ y } \frac{a}{d} > \frac{b}{d}$$

$$\frac{1}{3} < \frac{1}{2} \text{ y } \frac{3}{4} > \frac{2}{4}$$

Estas destrezas se aplican también a fracciones con denominadores distintos. Volvemos a escribir cada fracción con un denominador común, usando la multiplicación para hacer una fracción equivalente.

$$\frac{1}{3} \xrightarrow{\times 5} \frac{5}{15} \xleftarrow{\times 5}$$

Sumamos y restamos números mixtos tratando la parte del número entero y la parte fraccionaria por separado, desagrupando 1 entero si es necesario.

$$\begin{array}{rcl} 4\frac{1}{3} & = & 3\frac{20}{15} \\ -\ 2\frac{7}{15} & = & 2\frac{7}{15} \\ \hline & & 1\frac{13}{15} \end{array}$$

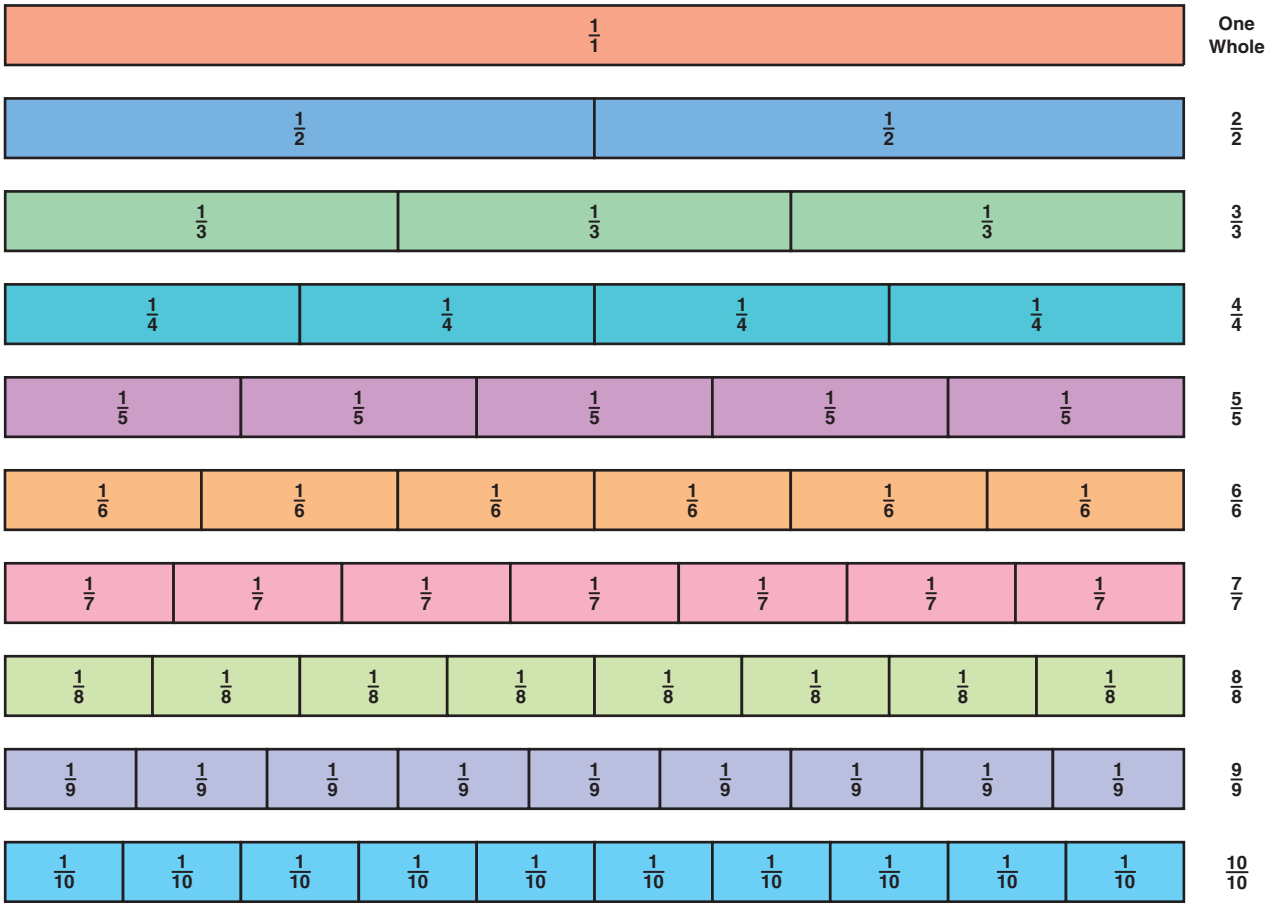
Atentamente,
El maestro de su niño

3–2 Class Activity

Name _____ Date _____

▶ Compare With Fraction Bars

The fraction bars show the same whole divided into different unit fractions.



Which is greater? Explain how you know.

1. $\frac{1}{4}$ or $\frac{1}{5}$ _____ _____

2. $\frac{9}{10}$ or $\frac{10}{10}$ _____ _____

3. $\frac{2}{9}$ or $\frac{3}{9}$ _____ _____

Circle the greater fraction.

4. $\frac{1}{50}$ $\frac{1}{60}$

5. $\frac{40}{45}$ $\frac{45}{45}$

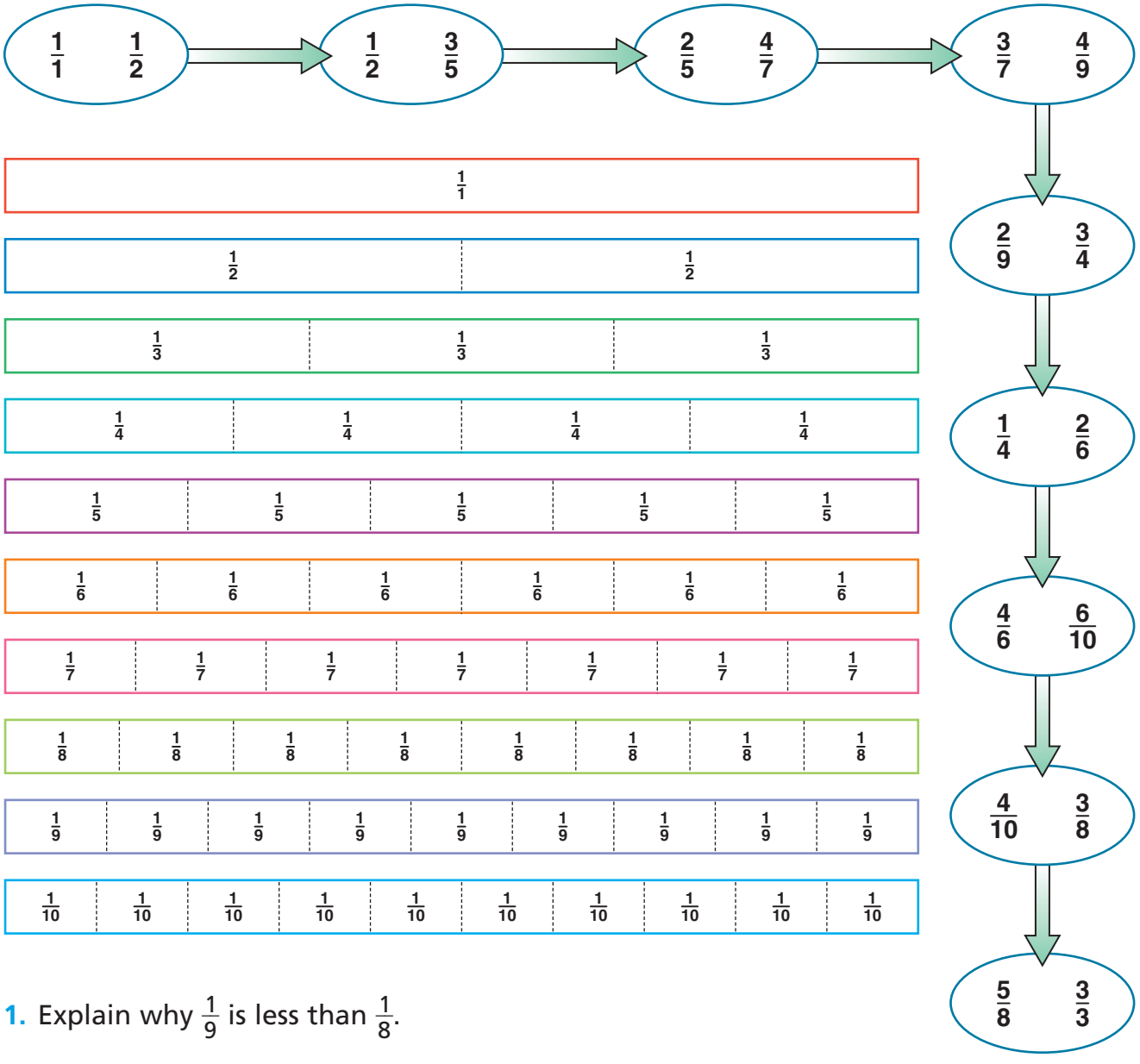
6. $\frac{2}{25}$ $\frac{4}{25}$

7. $\frac{1}{99}$ $\frac{1}{100}$

Name _____ Date _____

▶ Compare Unequal Fractions

Compare each set of fractions as you follow the trail. Then write the correct sign (< or >) between the fractions.



1. Explain why $\frac{1}{9}$ is less than $\frac{1}{8}$.

3–3 Class Activity

Name _____ Date _____

Vocabulary

numerator
denominator

▶ Find Unknown Numerators and Denominators

The **numerator** of a fraction tells the number of pieces of the whole. The **denominator** of a fraction tells the divisions of the whole.

numerator
number of pieces

$\frac{n}{d}$

denominator
divisions

Add or subtract.

1. $\frac{3}{5} - \frac{1}{5} =$ _____

2. $\frac{3}{9} + \frac{2}{9} + \frac{1}{9} =$ _____

Find *n*.

3. $\frac{2}{4} + \frac{1}{4} = \frac{n}{4}$
   $n =$ _____

4. $\frac{3}{6} + \frac{2}{6} = \frac{n}{6}$
   $n =$ _____

5. $\frac{5}{10} - \frac{4}{10} = \frac{n}{10}$
   $n =$ _____

6. $\frac{6}{7} - \frac{2}{7} = \frac{n}{7}$
   $n =$ _____

7. $\frac{4}{8} - \frac{3}{8} = \frac{n}{8}$
   $n =$ _____

8. $\frac{1}{12} + \frac{3}{12} + \frac{7}{12} = \frac{n}{12}$
   $n =$ _____

Find *d*.

9. $\frac{4}{7} + \frac{2}{7} = \frac{6}{d}$
   $d =$ _____

10. $\frac{7}{8} - \frac{2}{8} = \frac{5}{d}$
    $d =$ _____

11. $\frac{3}{d} + \frac{3}{d} + \frac{2}{d} = \frac{8}{9}$
    $d =$ _____

12. $\frac{1}{d} + \frac{1}{d} + \frac{1}{d} = \frac{d}{d}$
    $d =$ _____

13. $\frac{1}{d} + \frac{1}{d} + \frac{1}{d} + \frac{1}{d} + \frac{1}{d} + \frac{1}{d} + \frac{1}{d} = \frac{d}{d}$
    $d =$ _____

Which is greater?

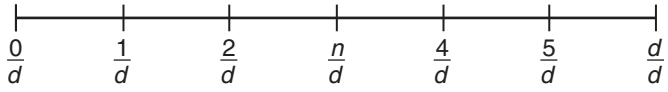
14. $\frac{7}{8}$ or $\frac{5}{8}$ _____

15. $\frac{3}{d}$ or $\frac{6}{d}$ _____

16. $\frac{9}{d}$ or $\frac{4}{d}$ _____

17. What is *d* in this fraction bar? _____

18. What is *d* in the number line?
    What is *n*? How do you know?
    d = _____ *n* = _____



_____

_____

3–3 Class Activity

Name _____ Date _____

▶ Real-World Fractions

Solve.

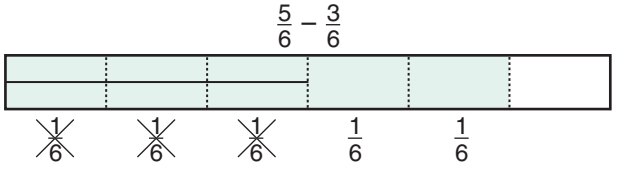
Show your work.

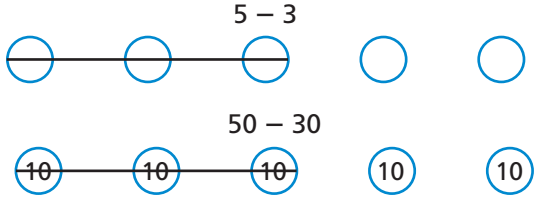
19. The Foster family bought a 1-pound (16-ounce) bag of popcorn kernels. On Sunday they popped 2 ounces, on Monday they popped 4 ounces, and on Tuesday they popped 3 ounces. What fraction of the popcorn have they popped so far? What fraction is left?

20. Mrs. Reuben walked $\frac{9}{10}$ mile from home and then went back $\frac{1}{10}$ mile. How far from home is she now?

▶ Summarize

Subtracting fractions means taking away fractions that are made of the same unit fraction (that have the same *d*).





21. How is subtracting fractions like subtracting whole numbers? How is it different?

22. How is subtracting fractions like adding fractions? How is it different?

3–4 Class Activity

Name _____ Date _____

Vocabulary

addend

▶ Find Addends that Total One

The numbers that you add to find the total in an addition expression are called **addends**.

$3 + 5 = 8$

The addends are 3 and 5. The total is 8.

$\frac{3}{9} + \frac{5}{9} = \frac{8}{9}$

The addends are $\frac{3}{9}$ and $\frac{5}{9}$. The total is $\frac{8}{9}$.

1. What part of the fraction does not change when you add or subtract?

_____

Add or subtract.

2. $\frac{3}{8} + \frac{4}{8} =$ _____

3. $\frac{2}{7} + \frac{3}{7} =$ _____

4. $\frac{5}{9} - \frac{2}{9} =$ _____

5. $\frac{1}{75} + \frac{1}{75} =$ _____

6. $\frac{3}{50} + \frac{3}{50} =$ _____

7. $\frac{9}{67} - \frac{5}{67} =$ _____

Find $\frac{n}{d}$.

8. $\frac{2}{5} + \frac{n}{d} = 1$

$\frac{n}{d} =$ _____

9. $\frac{3}{9} + \frac{n}{d} = 1$

$\frac{n}{d} =$ _____

10. $\frac{7}{12} + \frac{4}{12} = \frac{n}{d}$

$\frac{n}{d} =$ _____

11. $1 - \frac{7}{10} = \frac{n}{d}$

_____

$\frac{n}{d} =$ _____

12. $1 - \frac{8}{17} = \frac{n}{d}$

_____

$\frac{n}{d} =$ _____

13. $1 - \frac{18}{20} = \frac{n}{d}$

_____

$\frac{n}{d} =$ _____

14. $\frac{15}{30} + \frac{10}{30} = \frac{n}{d}$

$\frac{n}{d} =$ _____

15. $\frac{39}{40} + \frac{n}{d} = 1$

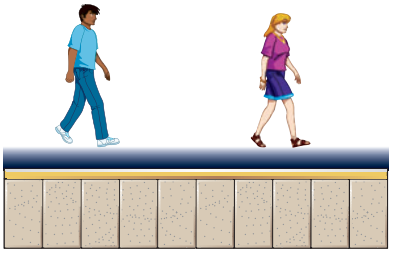
$\frac{n}{d} =$ _____

16. $\frac{70}{100} + \frac{n}{d} = 1$

$\frac{n}{d} =$ _____

3–4 Class Activity

Name Date



▶ Unknown Addends in Real Life

Solve.

Show your work.

17. A woman has walked $\frac{8}{10}$ of the length of a sidewalk. How much farther does she need to go to reach the end?

18. A man has walked $\frac{3}{10}$ of the length of the sidewalk. How much farther does he need to go to reach the end?

19. A squirrel climbed $\frac{3}{8}$ of the way up a tree. How much higher does it need to go to reach the top?

20. Another squirrel climbed $\frac{9}{16}$ of the way up the tree. How much farther does it need to go to reach the top?

21. We ate $\frac{5}{12}$ of a watermelon at breakfast. At lunch we ate $\frac{7}{12}$ of the same melon. How much of the watermelon is left for dinner?

22. The sailboat is $\frac{5}{9}$ of the way across the lake. How much farther does it have to go to reach the shore?

23. The rowboat is $\frac{4}{17}$ of the way across the lake. How much farther does it have to go to reach the shore?

24. I mowed $\frac{7}{12}$ of the lawn and my friend mowed $\frac{3}{12}$. How much of the lawn do we still have to mow?

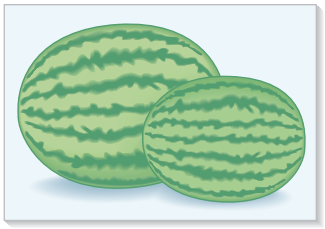
3–5 Class Activity

Name _____ Date _____

▶ Explore Changing Wholes

Before you decide how much a fraction represents, you need to know how big the whole is.

1. Would you prefer to have $\frac{1}{2}$ of the large watermelon or $\frac{1}{2}$ of the small one? Why?



_____

_____

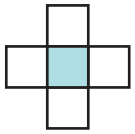
_____

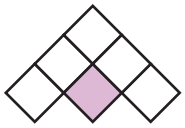
2. Would you prefer to sweep $\frac{1}{3}$ of the gymnasium or $\frac{1}{3}$ of your classroom? Why?

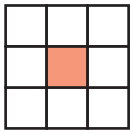
_____

_____

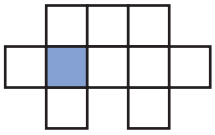
What fraction of the whole is each shaded square?

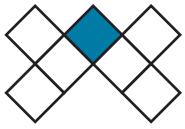
3.  _____

4.  _____

5.  _____

6.  _____

7.  _____

8.  _____

9. The shaded squares in exercises 3–8 are all the same size. Why are the fractions different?

_____

_____

3–5 Class Activity

Name _____ Date _____

▶ Solve Problems With Changing Wholes

Solve.

Show your work.

10. Adrianne and Gabriél have 80 cherries. They need 50 cherries to make a pie and they would also like a snack. Adrianne wants to eat $\frac{1}{2}$ of the 80 cherries, and Gabriél wants to eat $\frac{1}{4}$ of them. Will that leave enough cherries for the pie? Why or why not?

_____

_____

11. Sophia says she knows a way for Adrianne and Gabriél to eat $\frac{1}{2}$ and $\frac{1}{4}$ of the cherries and still have 50 left for the pie. First, divide the 80 cherries equally so that Adrianne and Gabriél each get the same amount. Adrianne eats $\frac{1}{2}$ of hers, and Gabriél eats $\frac{1}{4}$ of his. Will this leave enough cherries for the pie? Why or why not?

_____

_____

12. Why are your answers for problems 10 and 11 different?

_____

_____

_____

13. The 4 runners on a relay team all want to run the same distance in a race. The coach says that the first runner will go $\frac{1}{4}$ of the distance. Then the second runner will go $\frac{1}{3}$ of the remaining distance. The third runner will go $\frac{1}{2}$ of the distance that is left at that point. The fourth runner will finish the race. Will each runner run the same distance? Why or why not?

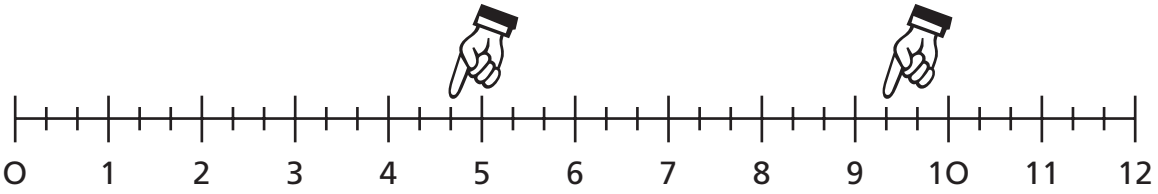
_____

_____

Name _____ Date _____

Vocabulary
mixed number

▶ Represent and Add Mixed Numbers



1. What fractional parts are shown on the number line?

_____

2. What **mixed numbers** do the fingers show?

_____

3. Where is $\frac{12}{3}$ on the number line?

_____

4. Where is $\frac{30}{3}$?

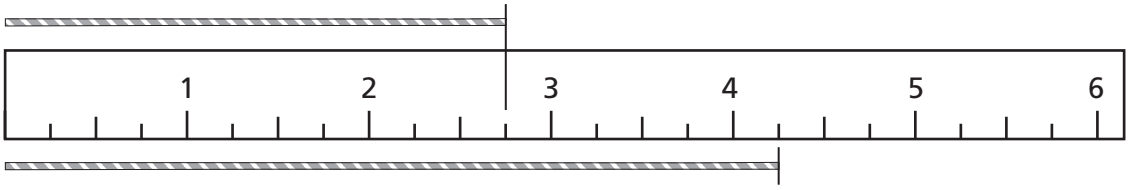
_____

5. Where is $\frac{31}{3}$?

_____

6. How can you add $4\frac{1}{3} + 1\frac{1}{3}$ on the number line?

_____



7. What fractional parts are shown on the inch ruler?

_____

8. How long is each string? _____

9. If you place the strings end to end, how long are they?

_____

Complete these equations.

10. $9\frac{5}{12} + 3\frac{1}{12} =$ _____

11. $7\frac{1}{8} + 2\frac{5}{8} =$ _____

3–7 Class Activity

Name _____ Date _____

▶ Add Mixed Numbers by Adding Separately

We can use our properties and definitions to prove that $8\frac{1}{9} + 2\frac{4}{9} = (8 + 2) + \left(\frac{1}{9} + \frac{4}{9}\right)$.

Definition of a Mixed Number: $a\,\frac{n}{d} = a + \frac{n}{d}$

Commutative Property: $a + b = b + a$

Associative Property: $a + (b + c) = (a + b) + c$

Below is the math proof. Write the property or definition for each step.

12. $8\frac{1}{9} + 2\frac{4}{9} = \left(8 + \frac{1}{9}\right) + 2\frac{4}{9}$ _____

13. $\left(8 + \frac{1}{9}\right) + 2\frac{4}{9} = 8 + \left(\frac{1}{9} + 2\frac{4}{9}\right)$ _____

14. $8 + \left(\frac{1}{9} + 2\frac{4}{9}\right) = 8 + \left(\frac{1}{9} + \left(2 + \frac{4}{9}\right)\right)$ _____

15. $8 + \left(\frac{1}{9} + \left(\frac{4}{9} + 2\right)\right) = 8 + \left(\frac{1}{9} + \left(\frac{4}{9} + 2\right)\right)$ _____

16. $8 + \left(\frac{1}{9} + \left(\frac{4}{9} + 2\right)\right) = 8 + \left(\left(\frac{1}{9} + \frac{4}{9}\right) + 2\right)$ _____

17. $8 + \left(\left(\frac{1}{9} + \frac{4}{9}\right) + 2\right) = 8 + \left(2 + \left(\frac{1}{9} + \frac{4}{9}\right)\right)$ _____

18. $8 + \left(2 + \left(\frac{1}{9} + \frac{4}{9}\right)\right) = \left(8 + 2\right) + \left(\frac{1}{9} + \frac{4}{9}\right)$ _____

19. So we have proved that $8\frac{1}{9} + 2\frac{4}{9} = \left(8 + 2\right) + \left(\frac{1}{9} + \frac{4}{9}\right)$.

Now complete the addition problem. _____

Complete these equations. Circle those you can do in your head.

20. $4\frac{1}{9} + 2\frac{1}{9} =$ _____ 21. $5\frac{3}{8} + 2\frac{2}{8} =$ _____ 22. $1\frac{1}{6} + 3\frac{4}{6} =$ _____

23. $4\frac{1}{3} + 6\frac{1}{3} =$ _____ 24. $2\frac{1}{4} + 2\frac{3}{4} =$ _____ 25. $3\frac{2}{7} + 2\frac{5}{7} =$ _____

Write each total as a mixed number.

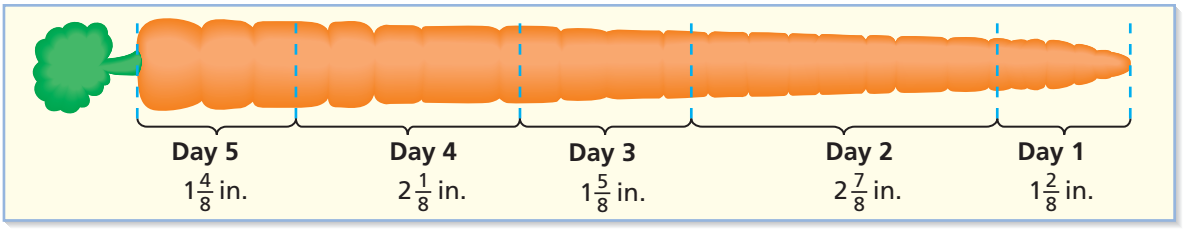
26. $1\frac{3}{5} + 2\frac{4}{5} =$ _____ 27. $40\frac{6}{7} + 22\frac{5}{7} =$ _____ 28. $6\frac{8}{9} + 4\frac{7}{9} =$ _____

3–8 Class Activity

Name _____ Date _____

▶ Solve Problems

The total length of the carrot is $9\frac{3}{8}$ inches.



This drawing shows how much of the carrot a rabbit ate each day until the carrot was gone.

Solve.

1. What was the length of the carrot when the rabbit started?

_____

2. How long did it take the rabbit to eat the whole carrot?

_____

3. Write and solve equations to determine how much of the carrot is left at the end of each day. Fill in the table as you find each answer. **Hint:** The length of carrot at the *beginning* of each day will be the same as the length of carrot at the *end* of the previous day.

	Length at Beginning of Day	Amount Eaten	Length at End of Day
Day 1	$9\frac{3}{8}$ in.	$1\frac{2}{8}$ in.	
Day 2			
Day 3			
Day 4			
Day 5			

4. **On the Back** If the last number in your table is 0, then you solved the problem correctly. Explain why you know this is true.

Name _____ Date _____

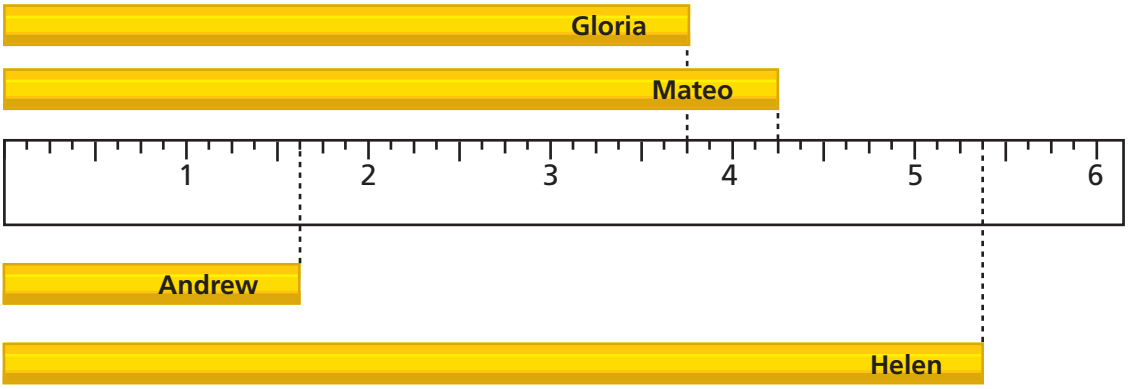
3–9 Class Activity

Name _____ Date _____

Vocabulary
subtract
add on

▶ Compare Mixed Numbers

This inch ruler shows the lengths of four pencils.



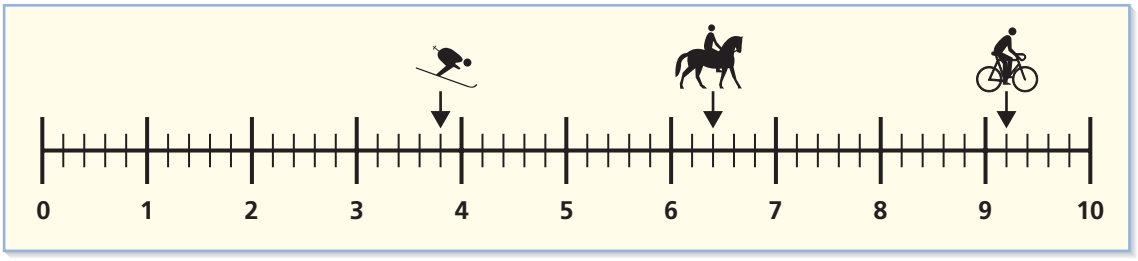
1. How long is Gloria's pencil? _____

   How long is Mateo's pencil? _____

2. How much longer is Mateo's pencil than Gloria's pencil?
   Hint: First solve by **adding on** from the length of Gloria's pencil to make the length of Mateo's pencil. Then **subtract** the shorter length from the longer to see if you get the same answer. _____

3. How much shorter is Andrew's pencil than Helen's pencil?
   Hint: First solve by adding on from the length of Andrew's pencil to make Helen's pencil. Then subtract the shorter length from the longer length to see if you get the same answer. _____

This number line shows how many miles three athletes traveled.



4. How much farther did the cyclist travel than the horseback rider? _____

5. How much farther did the horseback rider travel than the skier? _____

Name _____ Date _____

▶ Solve Problems

Show your work.

Use what you know about adding and subtracting mixed numbers to solve each problem.

1. Kanesha ordered 6 pizzas for a party: 2 cheese pizzas, 2 Hawaiian pizzas, and 2 pepperoni pizzas. At the end of the party, $1\frac{3}{10}$ cheese pizzas, $\frac{5}{10}$ Hawaiian pizzas, and $1\frac{1}{10}$ pepperoni pizzas were left. How many pizzas were eaten altogether?

_____

2. Shing wants to fence a rectangular area for his rabbit. One side of the fence must be $8\frac{1}{4}$ feet long. Shing will use 28 feet of fencing. How long will the other side be?

_____

3. Ella needs to measure $2\frac{1}{4}$ cups flour, $1\frac{3}{4}$ cups oatmeal, and $\frac{3}{4}$ cups sugar for a recipe. Can she fit all these ingredients in a 4-cup measuring cup at the same time?

_____

4. Mr. Campbell can drive straight to Plainsville, or he can take a more scenic route by going through Riverdale. It is $12\frac{3}{8}$ miles to Plainsville. It is $6\frac{5}{8}$ miles to Riverdale. It is $7\frac{7}{8}$ miles from Riverdale to Plainsville. How much farther is it to go to Plainsville by driving through Riverdale?

_____

Name _____ Date _____

▶ Correct a Solution

Dear Math Students:

There is a running path near our school that is $1\frac{1}{2}$ (or $\frac{3}{2}$) miles long. My friends and I want to run 3 miles every day. We are trying to figure out how many times we need to run the path to reach 3 miles. No matter how many times we add $\frac{3}{2}$, we never seem to reach 3. Here is our work:

Running 2 times: $\frac{3}{2} + \frac{3}{2} = \frac{6}{4}$ This is less than 3.

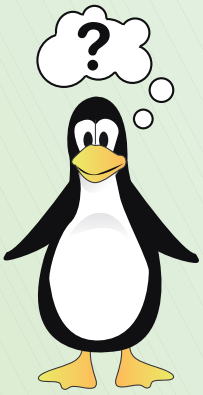
Running 3 times: $\frac{3}{2} + \frac{3}{2} + \frac{3}{2} = \frac{9}{6}$ This is less than 3.

Running 4 times: $\frac{3}{2} + \frac{3}{2} + \frac{3}{2} + \frac{3}{2} = \frac{12}{8}$ This is less than 3.

What have we done wrong?

Thank you for your help.

Puzzled Penguin



1. Write a response to Puzzled Penguin. Solve the problem and explain the mistake he and his friends are making in their solution strategy.

_____

_____

_____

_____

▶ Addition and Subtraction Word Problems

2. **On the Back** Write a word problem that can be solved using fractions. Write the answer to your problem here.

_____

Name _____ Date _____

3–11 Class Activity

Name _____ Date _____

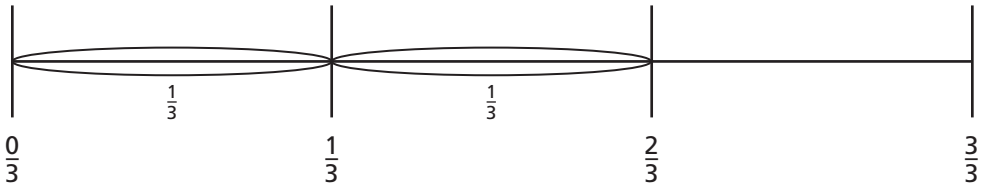
Vocabulary

equivalent fractions

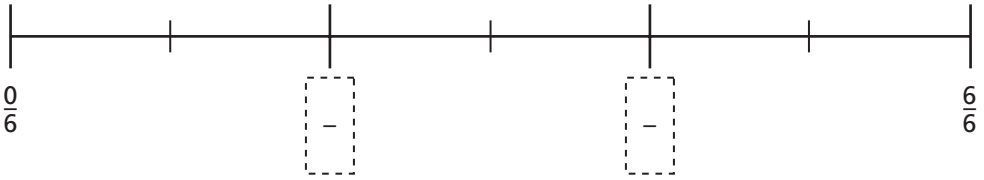
▶ Find Equivalent Fractions by Multiplying

You can use a number line to find **equivalent fractions**.

Circle the unit fractions up to $\frac{2}{3}$. Complete the number lines and equation boxes to find equivalent fractions for $\frac{2}{3}$.

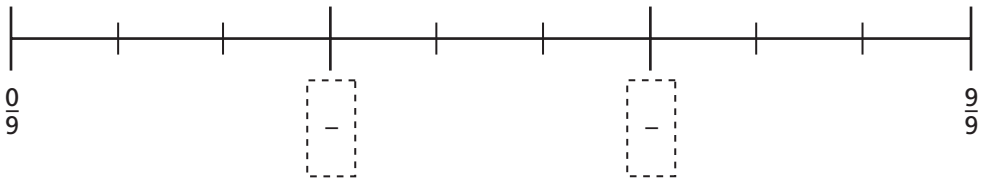


1. Sixths



$$\frac{2 \times \square}{3 \times \square} = \frac{\square}{6}$$

2. Ninths



$$\frac{2 \times \square}{3 \times \square} = \frac{6}{9}$$

3–11 Class Activity

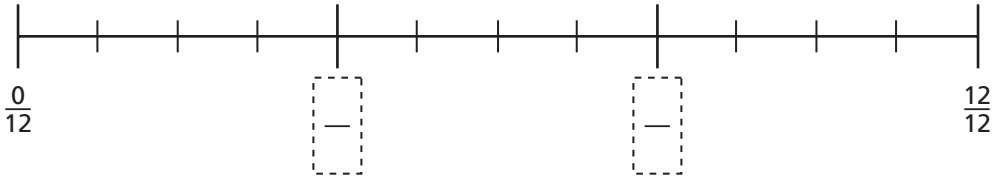
Name _____ Date _____

Vocabulary

unsimplify

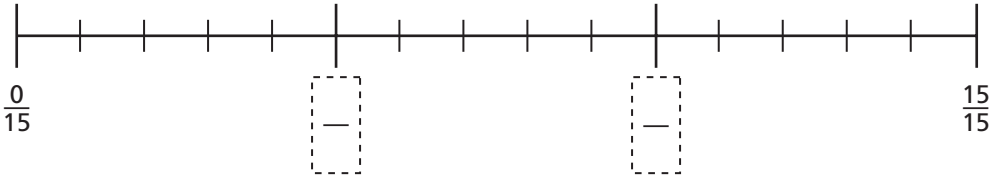
Circle the unit fractions up to $\frac{2}{3}$. Complete the number lines and equation boxes to find equivalent fractions for $\frac{2}{3}$.

3. Twelfths



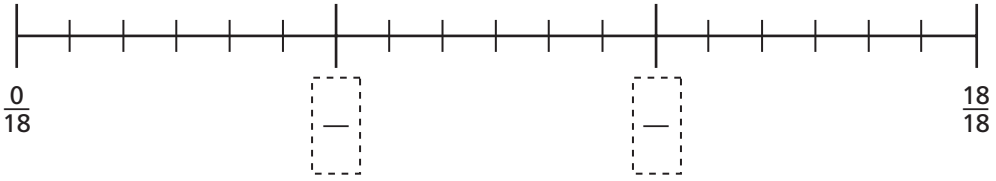
$$\frac{2 \times \square}{3 \times \square} = \frac{\square}{12}$$

4. Fifteenths



$$\frac{2 \times \square}{3 \times \square} = \frac{\square}{15}$$

5. Eighteenths



$$\frac{2 \times \square}{3 \times \square} = \frac{\square}{18}$$

6. When you **unsimplify** to make an equivalent fraction, you multiply the numerator and denominator by the same number to make more but smaller unit fractions. Discuss how that has happened for problems 1 through 5 on these two pages.

3–11 Class Activity

Name Date

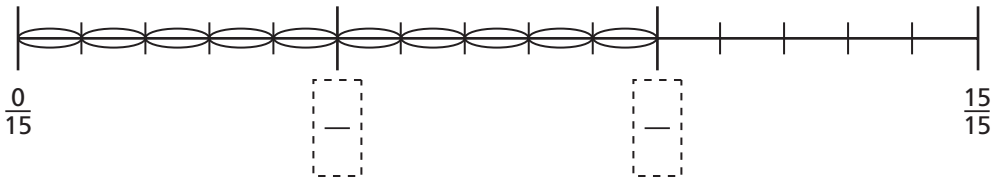
Vocabulary

simplify

▶ Find Equivalent Fractions by Dividing

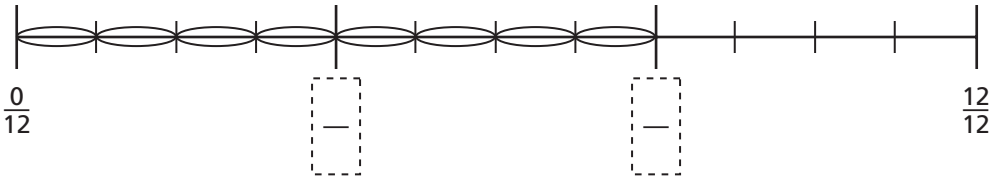
Complete the number lines and equation boxes to show how to simplify each fraction to $\frac{2}{3}$.

7. Fifteenths



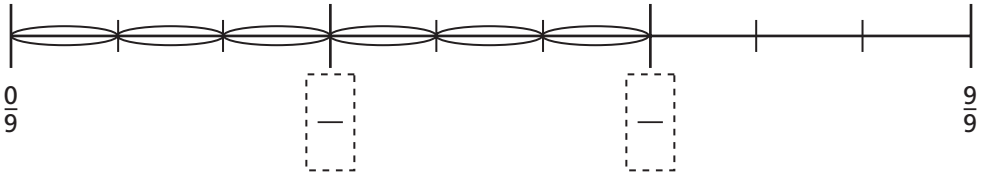
$$\frac{10 \div \square}{15 \div \square} = \frac{2}{3}$$

8. Twelfths



$$\frac{8 \div \square}{12 \div \square} = \frac{2}{3}$$

9. Ninths



$$\frac{6 \div \square}{9 \div \square} = \frac{2}{3}$$

10. When you simplify to make an equivalent fraction, you divide the numerator and denominator by the same number to make fewer but bigger unit fractions. Discuss how that has happened for problems 7 through 9 above.

11. Discuss how simplifying and unsimplifying are alike and different.

3–11 Class Activity

Name _____ Date _____

▶ Solve Real-World Problems

Henri needs to make $\frac{2}{3}$ of his free throws in order to make the basketball team. Answer questions 12–14 about Henri's throws.

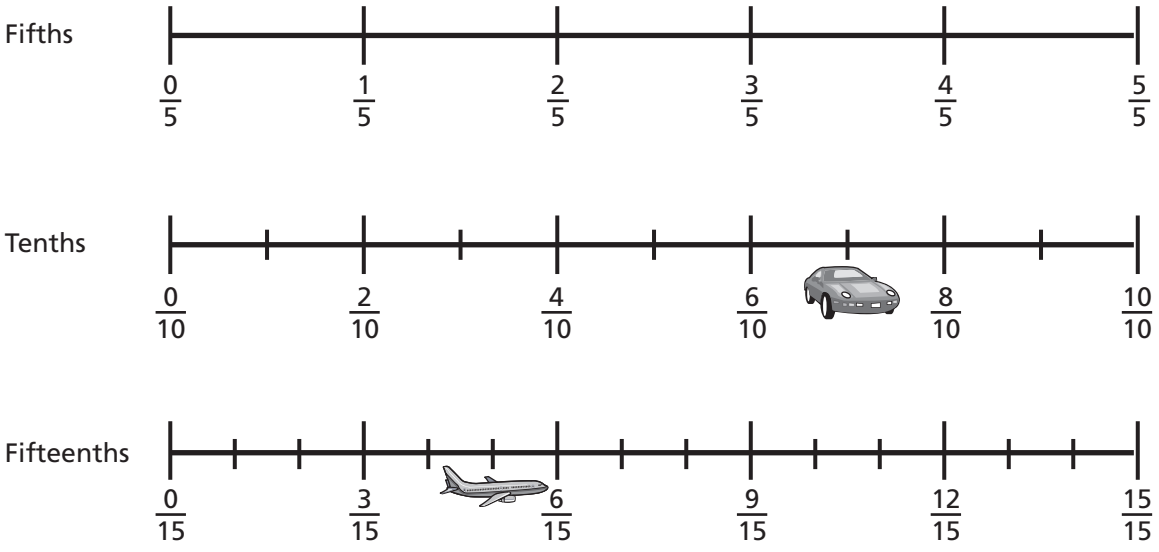
12. If he throws 12 times, how many baskets does he need? _____

13. If he throws 9 times, how many baskets does he need? _____

14. If he throws 15 times, how many baskets does he need? _____

▶ Practice Using Equivalent Fractions

Use the number lines to complete exercises 15–18.



15. What fraction is marked by the car? _____

16. What fraction is marked by the airplane's wing? _____

17. If you worked $\frac{4}{5}$ of an hour, how many tenths of an hour did you work?

_____

18. Which is larger, $\frac{2}{5}$ or $\frac{4}{15}$? How do you know?

_____

3–12 Class Activity

Name _____ Date _____

Vocabulary
multiplication table

▶ Use the Multiplication Table to Find Equivalent Fractions

You can use these multiplication tables to find equivalent fractions.

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

$\frac{3}{5}$ $\frac{6}{10}$ $\frac{9}{15}$ $\frac{12}{20}$ $\frac{15}{25}$ $\frac{18}{30}$ $\frac{21}{35}$ $\frac{24}{40}$ $\frac{27}{45}$ $\frac{30}{50}$

$\frac{4}{7}$ $\frac{8}{14}$ $\frac{12}{21}$ $\frac{16}{28}$ $\frac{20}{35}$ $\frac{24}{42}$ $\frac{28}{49}$ $\frac{32}{56}$ $\frac{36}{63}$ $\frac{40}{70}$

1. Color rows 4 and 9 in the first table. Use the table to complete the equivalent fractions for $\frac{1}{9}$.

   $\frac{4}{9} = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_$

2. Color rows 3 and 8 in the second table. Use the table to complete the equivalent fractions for $\frac{3}{10}$.

   $\frac{3}{8} = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_$

3. Make your own equivalent fractions.

   $\_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \_\_\_\_$

Name _____ Date _____

▶ Split Fraction Bars

Use the fraction bars to find equivalent fractions for $\frac{5}{6}$.

$\frac{5}{6}$

4.

$\frac{\square}{12}$

Multiplier = $\square$

$\frac{5 \times \square}{6 \times \square} = \frac{\square}{12}$

5.

$\frac{\square}{18}$

Multiplier = $\square$

$\frac{5 \times \square}{6 \times \square} = \frac{\square}{18}$

6.

$\frac{\square}{24}$

Multiplier = $\square$

$\frac{5 \times \square}{6 \times \square} = \frac{\square}{24}$

Use the fraction bars to find equivalent fractions for $\frac{3}{4}$.

$\frac{3}{4}$

7.

$\frac{\square}{8}$

Multiplier = $\square$

$\frac{3 \times \square}{4 \times \square} = \frac{\square}{8}$

8.

$\frac{\square}{12}$

Multiplier = $\square$

$\frac{3 \times \square}{4 \times \square} = \frac{\square}{12}$

3–13 Class Activity

Name _____ Date _____

Vocabulary

equivalent
simplify
unsimplify

▶ Find Unknown Numerators and Denominators

Find *n* or *d*.

1. $\frac{1}{4} = \frac{n}{12}$ $n =$ _____
2. $\frac{2}{5} = \frac{12}{d}$ $d =$ _____
3. $\frac{6}{36} = \frac{n}{6}$ $n =$ _____
4. $\frac{4}{20} = \frac{2}{d}$ $d =$ _____
5. $\frac{2}{9} = \frac{n}{45}$ $n =$ _____
6. $\frac{3}{8} = \frac{30}{d}$ $d =$ _____
7. $\frac{12}{16} = \frac{n}{4}$ $n =$ _____
8. $\frac{14}{35} = \frac{2}{d}$ $d =$ _____
9. $\frac{15}{25} = \frac{n}{5}$ $n =$ _____
10. $\frac{9}{36} = \frac{3}{d}$ $d =$ _____
11. $\frac{21}{28} = \frac{n}{4}$ $n =$ _____
12. $\frac{12}{20} = \frac{6}{d}$ $d =$ _____

Two fractions are **equivalent** if either can be changed into the other by multiplying or dividing the numerator and denominator by the same number.

To **simplify** a fraction, divide the numerator and denominator by the same number to make a *smaller* number of *larger* unit fractions.

To **unsimplify** a fraction, multiply the numerator and denominator by the same number to make a *larger* number of *smaller* unit fractions.

Use the words *multiply, divide, simplify,* and *unsimplify* to complete the statements.

13. To change $\frac{3}{5}$ to $\frac{18}{30}$, _____ the numerator and denominator by 6 in order to _____ the fraction.

14. To change $\frac{18}{30}$ to $\frac{3}{5}$, _____ the numerator and denominator by 6 in order to _____ the fraction.

3–13 Class Activity

Name _____ Date _____

▶ Solve Fraction Problems

Answer the questions about the table.

The Weather in April	
Sunny Days	10
Cloudy Days	12
Rainy Days	8

15. What fraction of the days were sunny? _____

Simplify the fraction. _____

16. What is the advantage of simplifying the fraction?

_____

_____

17. What is the advantage of leaving the fraction unsimplified?

_____

_____

_____

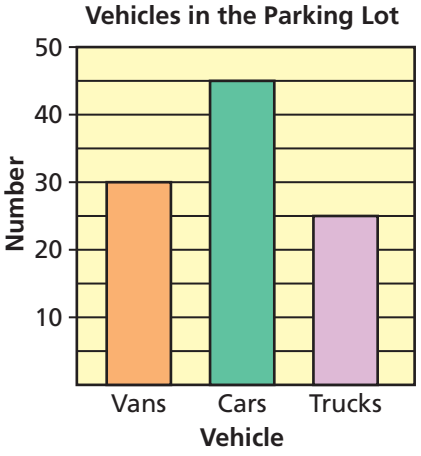
18. What fraction of the days were cloudy? _____

Simplify the fraction _____

19. What fraction of the days were rainy? _____

Simplify the fraction _____

Answer the questions about the bar graph.



20. What fraction of the vehicles are vans? _____

Simplify the fraction _____

21. What fraction of the vehicles are cars? _____

Simplify the fraction _____

22. What fraction of the vehicles are trucks? _____

Simplify the fraction _____

23. Do cars represent more or fewer than half of all the vehicles in the lot? _____ How do you know?

_____

_____

3–14 Class Activity

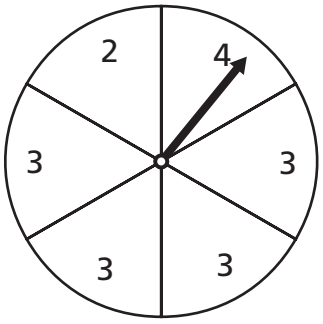
Name _____ Date _____

Vocabulary

likely
unlikely
certain
impossible
probability

▶ Use the Language of Probability

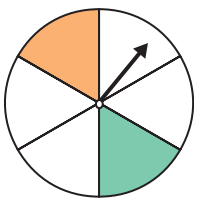
Use the words likely, unlikely, certain, or impossible to describe each event for the spinner.



1. Spinning a 2 _____
2. Spinning a 3 _____
3. Spinning a 5 _____
4. Spinning a number less than 5 _____
5. Which numbers are you equally likely to spin? _____

▶ Relate Probability to Fractions

6. What is the total number of sections for the spinner? _____
7. How many sections have a 2 on them? _____
8. What is the probability of spinning a 2? _____
9. How many sections have a 3 on them? _____
10. What is the probability of spinning a 3? _____
11. What is the probability of spinning a 4? _____
12. What is the total of the three probabilities in exercises 8–11? _____
13. What is the probability of spinning a number less than 5? _____
14. What is the probability of spinning a 5? _____



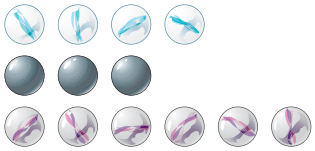
▶ Solve Probability Problems

15. What is the total number of sections for the spinner? _____
    How many shaded sections are there? _____
    What is the probability that the spinner will stop on a shaded section? _____

    What is the probability that the spinner will stop on a white section? _____

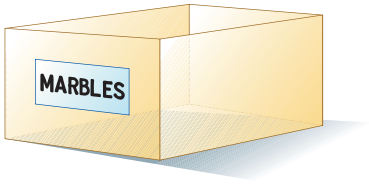
Name _____ Date _____

16. Suppose you put the marbles in the box and take one out without looking.
What is the probability that you will get a white marble?



_____

What is the probability that you will get a black marble?

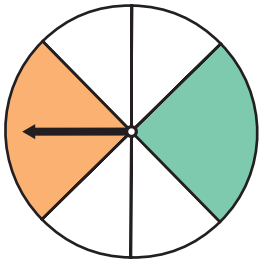


_____

What is the probability that you will get a gray marble?

_____

17. Ellen made this spinner with 4 white sections and 2 shaded sections. She says that the spinner is more likely to stop on a white section than a shaded section. Do you agree? Why or why not?



_____

_____

_____

▶ Make Predictions

Solve. Explain your reasoning.

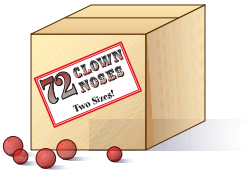
18. Suppose you have a can that contains 100 nuts. The label says that there are about 20 pecans, 30 walnuts, and 50 almonds. If you take out 10 nuts, how many of each kind would you expect to get?

_____

_____

_____

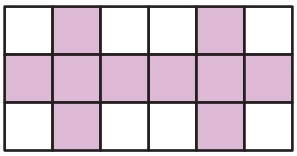
19. Mark found a box in the attic labeled "72 clown noses, 2 sizes." He took out 8 noses. Five of them were large and 3 of them were small. Out of the 72 total noses, how many are likely to be large? _____
How many are likely to be small? _____

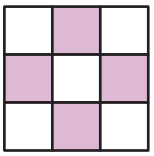


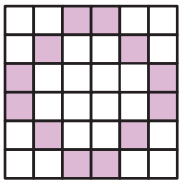
Name Date

▶ Try These Problems

20. Tavia makes unusual dartboards like these.

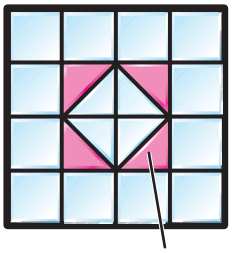






You want to try to hit one of the dark sections of one of the boards. Which board will you choose? Explain why.

21. Ryan and Steven were playing catch when they broke one pane in this window. Part of the window is clear glass. Part of it is valuable rose-colored glass. What is the probability that they broke the rose-colored glass?



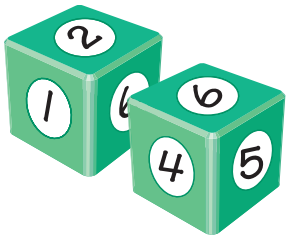
22. Two horses will soon give birth. The farmer predicts that the 2 newborn horses will both be male. His son predicts that they will both be female. His daughter predicts that there will be one male and one female. His wife says that her daughter has the best chance of making the correct prediction. The farmer says that is not possible because there are 3 equal possibilities. Who is right? Explain why.

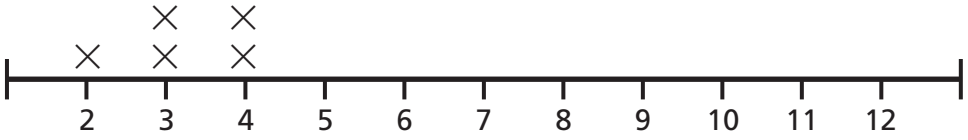
Name _____ Date _____

Vocabulary
frequency table
line plot

▶ Read Data from a Line Plot

Two number cubes, labeled 1 to 6, were tossed 30 times. This **frequency table** shows the number of times each total occurred. You can organize data on a **line plot** to make the data easier to analyze.





Total of 2 cubes	Number of tosses
2	1
3	2
4	2
5	3
6	5
7	6
8	4
9	4
10	2
11	1
12	0

1. The line plot has been filled in for tosses of 2, 3, and 4. Complete the rest of the line plot.

2. Based on this sample, describe the totals that are least likely to be thrown.

_____

3. Based on this sample, describe the totals that are most likely to be thrown.

_____

4. Why doesn't a total of 1 appear on the number line or the table?

_____

_____

_____

Based on the data for the 30 tosses, what is each probability?

5. Tossing a total of 7 _____

6. Tossing a total of 2 _____

7. Tossing a total of 12 _____

3–15 Class Activity

Name _____ Date _____

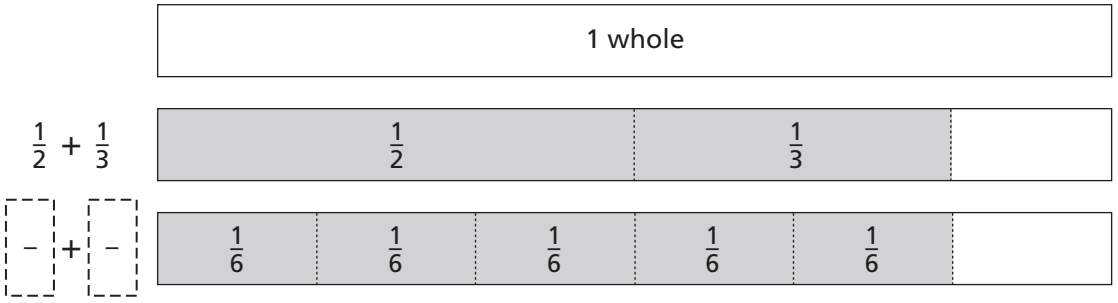
Vocabulary
common denominator

▶ Choose a Denominator

Find equivalent fractions for each fraction. To add them, they must have the same denominator. We call this a common denominator.

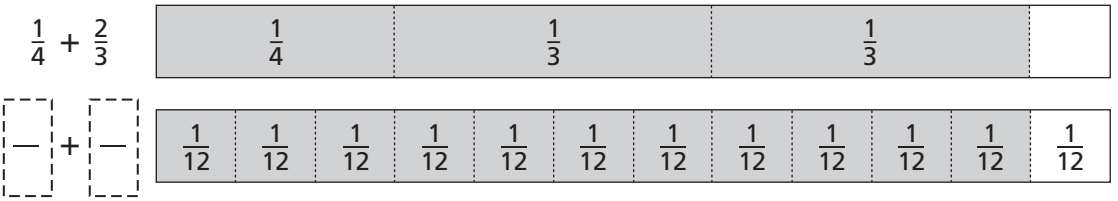
Show below the number lines how to find the equivalent fractions numerically.

1.



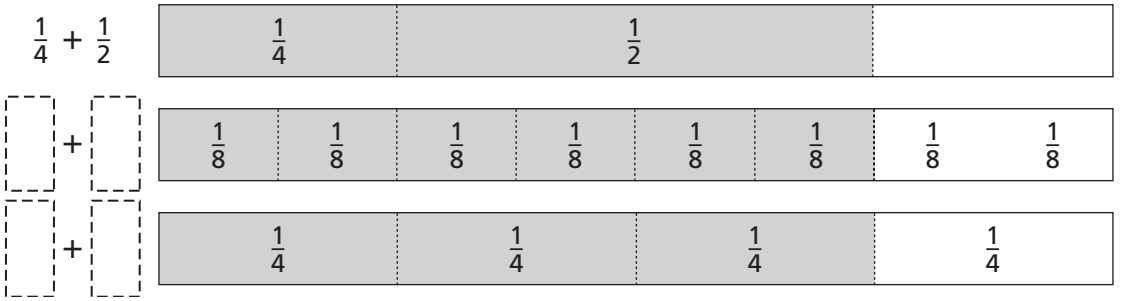
$\frac{1 \times}{2 \times} = \frac{3}{6}$ $\frac{1 \times}{3 \times} = \frac{2}{6}$ The common denominator is _____.

2.



$\frac{1 \times}{4 \times} = \frac{3}{12}$ $\frac{2 \times}{3 \times} = \frac{8}{12}$ The common denominator is _____.

3.



Which common denominator would you use? _____

Why? _____

4. Is $\frac{1}{2} + \frac{1}{3} = \frac{2}{5}$? _____ Discuss why or why not.

Name _____ Date _____

▶ Choose a Denominator (continued)

Tell which common denominator you will use. Then find equivalent fractions and add.

5. _____ $\frac{7}{10} + \frac{1}{5} = \frac{n}{d}$ _____

6. _____ $\frac{3}{11} + \frac{1}{2} = \frac{n}{d}$ _____

7. _____ $\frac{1}{6} + \frac{3}{4} = \frac{n}{d}$ _____

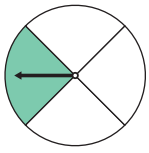
▶ Compare Unlike Fractions

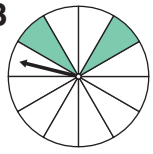
8. Tia and Carlos both ordered the same size pizza. Tia ate $\frac{9}{12}$ of her pizza. Carlos ate $\frac{5}{6}$ of his pizza. Who ate more pizza? How do you know?

_____

_____

9. Which spinner gives you a better chance of landing on a shaded space? Why?

A 

B 

_____

_____

10. East Bridge is $\frac{3}{5}$ of a mile long. West Bridge is $\frac{7}{10}$ of a mile long. Which bridge is shorter? How much shorter?

_____

11. Box A contains 14 marbles and 8 of them are black. Box B contains 21 marbles and 10 of them are black. If you had only one chance to draw a black marble, which box would you choose? Explain why.

_____

_____

Name _____ Date _____

▶ Add and Subtract Mixed Numbers

What error was made in each question? Find the correct solution.

1.
$$\begin{array}{r} 3\frac{1}{2} \\ +\ 6\frac{5}{7} \\ \hline 9\frac{6}{9} \end{array}$$

_____

_____

_____

2.
$$\begin{array}{r} 8\frac{1}{5} \\ -\ 2\frac{4}{5} \\ \hline 6\frac{3}{5} \end{array}$$

_____

_____

_____

3.
$$\begin{array}{r} 2\frac{1}{6} \\ +\ 1\frac{1}{9} \\ \hline 3\frac{16}{54} \end{array}$$

_____

_____

_____

Solve. Give your answer in the simplest form.

4. Dora the elephant eats $3\frac{3}{4}$ tons of food every month. Her baby eats $1\frac{1}{6}$ tons of food. How many tons of food do they eat together?

_____

5. The tallest elephant, Leroy, can reach a branch $12\frac{1}{3}$ feet off the ground. Daisy can reach $10\frac{5}{6}$ feet. How much farther can Leroy reach than Daisy?

_____

6. Speedy, the fastest elephant, can run $25\frac{1}{10}$ miles per hour. Squirt can run only $10\frac{3}{5}$ miles per hour. How many fewer miles can Squirt run in an hour than Speedy?

_____

7. The truck that carries the elephants holds 10 tons. Which two elephants could travel together in the truck? Name all the possible pairs.

_____

_____

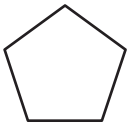
Dora	$5\frac{3}{4}$ tons
Leroy	$6\frac{1}{2}$ tons
Daisy	$4\frac{2}{3}$ tons
Speedy	$5\frac{2}{3}$ tons
Squirt	$3\frac{2}{3}$ tons

Name _____ Date _____

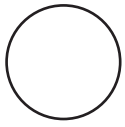
▶ Solve Equations Involving Fractions

Find the missing addend. Write your answers in simplest form.

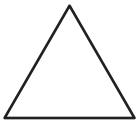
1. $2\frac{2}{3} + x = 3\frac{1}{6}$

$x =$ 

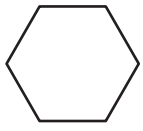
2. $\frac{7}{8} + x = 1\frac{1}{4}$

$x =$ 

3. $1\frac{19}{20} + x = 3\frac{1}{5}$

$x =$ 

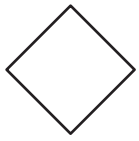
4. $x + 4\frac{5}{6} = 6\frac{5}{24}$

$x =$ 

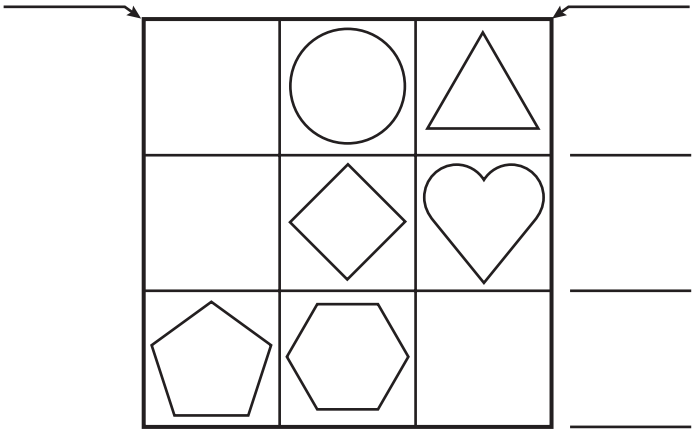
5. $x + \frac{1}{4} = \frac{7}{8}$

$x =$ 

6. $x + \frac{5}{8} = 1\frac{1}{2}$

$x =$ 

7. In this square, each row, column, and diagonal has the same total. Copy your answers from exercises 1–6 into the square below. Find the total of one row and use it to fill in the missing entries in the square. Write the totals you find on the blanks.



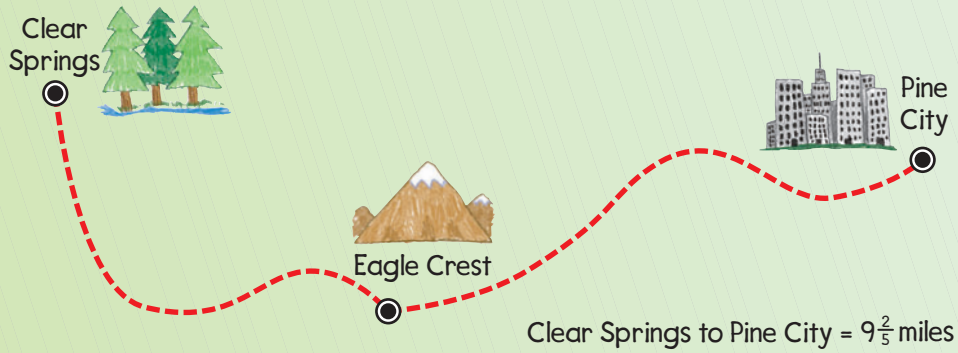
_____ _____ _____

Name Date

▶ Rename and Ungroup Fractions

Dear Math Students,

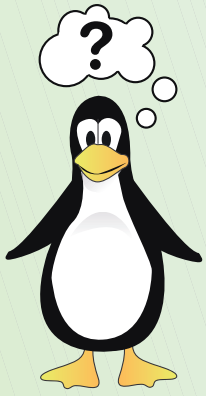
I live in the town of Clear Springs. I am going on a hike with several of my friends next week. We would like to walk to Eagle Crest.



Clear Springs to Pine City = $9\frac{2}{5}$ miles

Eagle Crest to Pine City = $6\frac{7}{10}$ miles

The map tells us the whole distance to Pine City and it tells us the distance from Eagle Crest to Pine City. But it does not tell us the distance from Clear Springs to Eagle Crest. We know we can subtractthe smaller distance from the larger to get our answer. But we don't know how to subtract these numbers.



Can you help?

Your friend,

Puzzled Penguin

1. Write an answer to the Puzzled Penguin.

3–17 Class Activity

Name _____ Date _____

▶ Choose How to Rename Fractions

The equations in each group have something in common.

Complete each equation.

Group 1	Group 2	Group 3
2. $\frac{9}{10} - \frac{2}{3} =$ _____	3. $\frac{9}{14} - \frac{2}{7} =$ _____	4. $\frac{5}{8} - \frac{1}{12} =$ _____
5. $4\frac{3}{5} + 2\frac{3}{4} =$ _____	6. $\frac{3}{28} + \frac{3}{4} =$ _____	7. $8\frac{5}{6} - 4\frac{3}{4} =$ _____
8. $\frac{2}{9} + \frac{1}{7} =$ _____	9. $3\frac{4}{18} - 1\frac{1}{3} =$ _____	10. $\frac{4}{9} + \frac{1}{6} =$ _____

11. How did you find the least common denominator for the equations in Group 1?

_____

12. How did you find the least common denominator for the equations in Group 2?

_____

13. How did you find the least common denominator for the equations in Group 3?

_____

14. Write one more equation that belongs in Group 1.

_____

15. Write one more equation that belongs in Group 2.

_____

16. Write one more equation that belongs in Group 3.

_____