

# Rational Number Project

## Fraction Operations and Initial Decimal Ideas

### Homework

Homework sets have been developed for many of the lessons to allow students to have extra practice and to further develop their understandings. Many of the homework sets have problems relevant to the lesson, as well as review items from previous work. While each worksheet designates a lesson that students should have had prior to doing the homework, it does not have to be given the exact day the lesson is used in the classroom. It was not the intent of the writers that students do all homework sets, the choice of when to assign homework is left to the discretion of the teacher.

Order the fractions in each set from smallest to largest.	Write a list of directions on how to order each set.
$\frac{4}{5}$ $\frac{1}{10}$ $\frac{7}{18}$ $\frac{4}{8}$	
$\frac{3}{100}$ $\frac{9}{10}$ $\frac{1}{4}$ $\frac{3}{50}$	
$\frac{99}{100}$ $\frac{1}{3}$ $\frac{10}{18}$ $\frac{7}{14}$	

**Using pictures to explain, answer the following questions.**

Mary shared a large pizza with 3 other friends and received her fair share. Jose shared a large pizza (same size as Mary's pizza) with 2 other friends and received his fair share? Who ate more? Why? (Use pictures in your explanation)

Mohammad ran  $\frac{4}{5}$  of the distance around the track. Marisela ran  $\frac{8}{9}$  of the distance around the track. Who ran more? Explain. (Use pictures in your explanation)

Bryce spent  $\frac{4}{5}$  of his allowance on a new DVD. Ada spent  $\frac{4}{5}$  of her allowance on a new calculator. Is it possible that Ada spent more than Bryce? Explain in detail.

Estimate the amount shaded:



$\frac{\quad}{19}$

$\frac{\quad}{35}$



## Fraction Estimation

The problems below were answered by another group of 6<sup>th</sup> graders. Using your estimation skills, determine if the answer is reasonable or not. Do not find the exact answer. Make your decision based on estimation. Describe your reason. The first problem is done for you.

$\frac{4}{6} + \frac{4}{8} = \frac{8}{14}$  This doesn't make sense. The answer must be greater than one since  $\frac{4}{6}$  is greater than  $\frac{1}{2}$  and  $\frac{4}{8}$  equals  $\frac{1}{2}$ .  $\frac{8}{14}$  is less than one.

$$\frac{2}{3} + \frac{1}{4} = \frac{11}{12}$$

$$\frac{11}{12} - \frac{1}{2} = \frac{10}{12}$$

$$\frac{1}{5} + \frac{2}{3} = \frac{3}{5}$$

Name \_\_\_\_\_

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$$\frac{1}{4} - \frac{2}{100} = \frac{1}{3}$$

$$\frac{2}{3} - \frac{1}{4} = \frac{1}{12}$$

$$\frac{11}{12} - \frac{1}{4} = \frac{10}{8}$$

$$\frac{4}{6} - \frac{3}{8} = \frac{1}{2}$$

## Adding and Subtracting Fractions

Directions: Read the story. Then read the questions. Decide if it is asking you to add or subtract. Then answer each of the questions.

**Story:**

Erik played basketball for  $\frac{5}{6}$  of an hour on Monday. He played basketball for  $\frac{1}{4}$  of an hour on Tuesday.

1. How much time did Erik spend playing basketball altogether?

Circle one: Add    Subtract

List fractions equal to  $\frac{5}{6}$ :

List fractions equal to  $\frac{1}{4}$ :

Write the sentence to solve:

2. How much longer did Erik play basketball on Monday than Tuesday?

Circle one: Add    Subtract

Write the sentence to solve:

**Story:**

On Thursday and Friday Scout ran a total of  $\frac{7}{8}$  of a mile. On Thursday she ran  $\frac{1}{2}$  of a mile.

**3. How far did Scout run on Friday?**

Circle one: Add   Subtract

List fractions equal to  $\frac{7}{8}$ :

List fractions equal to  $\frac{1}{2}$ :

Write the sentence to solve:

**4. How much further would she have to run if her goal is to run 4 miles this week?**

Circle one: Add   Subtract

Write the sentence to solve:

## Adding and Subtracting Fractions

Directions: Read the story. Then read the questions. Decide if it is asking you to add or subtract. Then answer each of the questions.

**Story:**

You ride your bike  $\frac{7}{8}$  of a mile.

Your younger brother only rides  $\frac{3}{4}$  of a mile.

**1. How much further did you bike than your brother?**

Circle one: Add   Subtract

List fractions equal to  $\frac{7}{8}$ :

List fractions equal to  $\frac{3}{4}$ :

Write the number sentence to solve:

**2. How much do you and your brother ride altogether?**

Circle one: Add   Subtract

Write the number sentence to solve:



**Story:**

Hamida and Michael made a pie. Hamida ate  $\frac{1}{3}$  of the pie and Michael ate  $\frac{1}{6}$  of the pie.

**3. How much of the total pie did Hamida and Michael eat?**

Circle one: Add   Subtract

List fractions equal to  $\frac{1}{3}$ :

List fractions equal to  $\frac{1}{6}$ :

Write the number sentence to solve:

**4. How much more did Hamida eat than Michael?**

Circle one: Add   Subtract

Write the number sentence to solve:

## Adding and Subtracting Fractions

Directions: Read the story. Then read the questions. Decide if it is asking you to add or subtract. Then answer each of the questions.

**Story:**

Samira has a bag of candy that weighs  $2\frac{1}{4}$  pounds. Taryn has a bag of candy that weighs  $1\frac{7}{8}$  pounds.

1. If Samira and Taryn put their candy together, how much will it weigh?

Circle one: Add    Subtract

Write the number sentence to solve:

2. Who has more candy, Samira or Taryn?

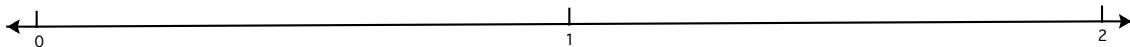
How much more candy does she have?

Circle one: Add    Subtract

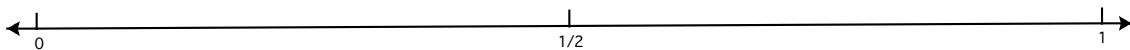
Write the number sentence to solve:

Estimate the answer. Place an X for your estimate on the number line.

3.  $\frac{6}{7} + \frac{1}{8} =$



4.  $\frac{7}{9} - \frac{5}{7} =$



**Story:**

Liam and Grace are both practicing their parts for the school musical. Liam practiced for  $3\frac{7}{12}$  hours and Grace practiced for  $2\frac{1}{6}$  hours.

5. How much did they practice total?

Circle one: Add    Subtract

Write the sentence to solve:

6. How much more would they have to practice if their goal was to reach a total of 6 hours?

Circle one: Add    Subtract

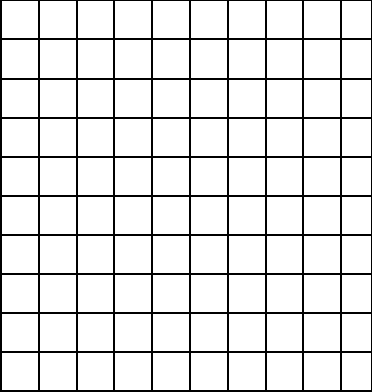
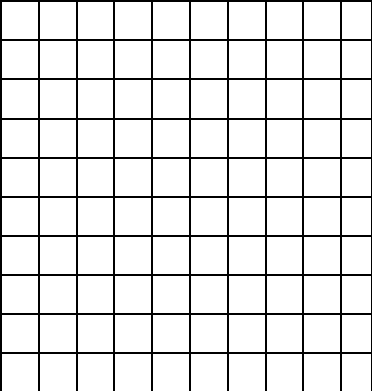
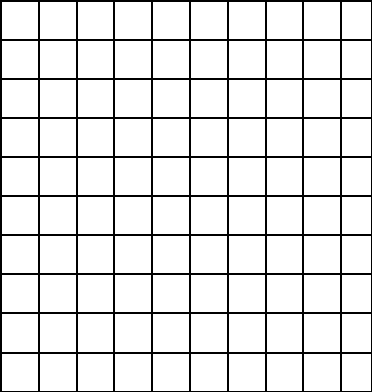
Write the sentence to solve:

Find the sum or difference:

7.  $\frac{4}{5} + \frac{3}{8} =$

8.  $\frac{7}{9} - \frac{1}{2} =$

Record each amount in different ways as shown in the first example (picture, words, fraction symbols, decimal symbols).

Picture	Describe 2 ways	Fraction Symbols	Decimal Symbol
	<i>3-tenths and 2- hundredths or 32-hundredths</i>	$\frac{3}{10} + \frac{2}{100}$ $\frac{32}{100}$	.32
			.08
	<i>49- hundredths or 4-tenths and 9-hundredths</i>		

**Solve the review problems:****1. Add the fractions:**

$$\frac{1}{3} + \frac{1}{6} + \frac{1}{9}$$

**2. Explain which fraction is larger and why:**

$$\frac{7}{10} \text{ or } \frac{65}{100}$$

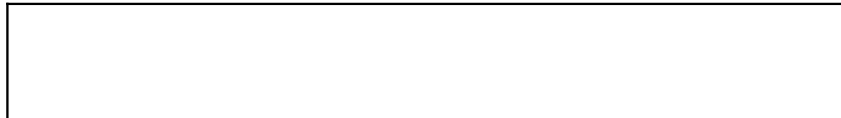
Partition the blank strip to show a fraction equivalent to the fraction shown on the strip above it.

**3.**

$$\frac{9}{12}$$



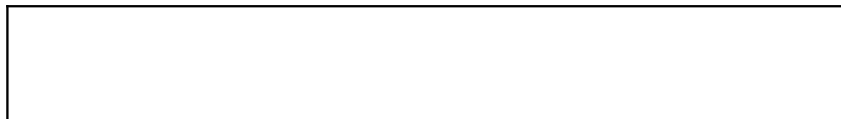
$$\frac{\quad}{4}$$

**4.**

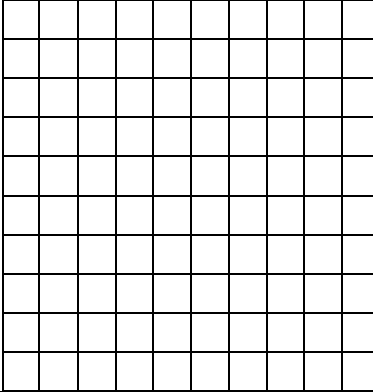
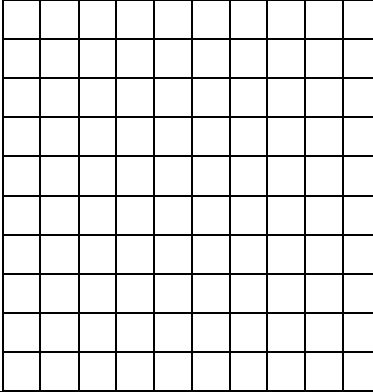
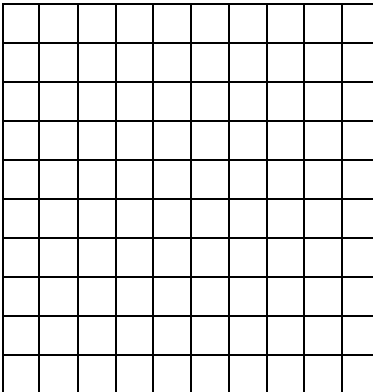
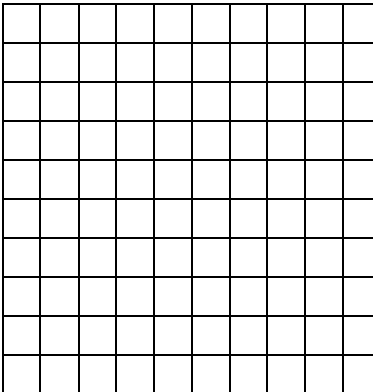
$$\frac{6}{10}$$



$$\frac{\quad}{5}$$

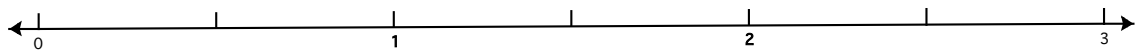


## Comparing Decimals

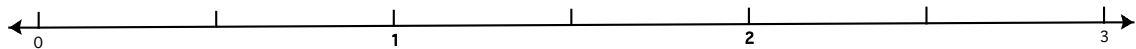
1. Shade in 0.45 of the grid	Shade in 0.08 of the grid.	Explain which is larger
		
2. Shade in 0.035 of the grid	Shade in 0.12 of the grid.	Explain which is larger
		

Estimate the following sums or differences. Place an X on the number line where your estimate lies.

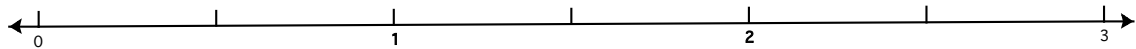
1.  $5.03 - 4.97$



2.  $0.87 + 1.25$



3.  $1\frac{4}{5} - \frac{8}{9}$

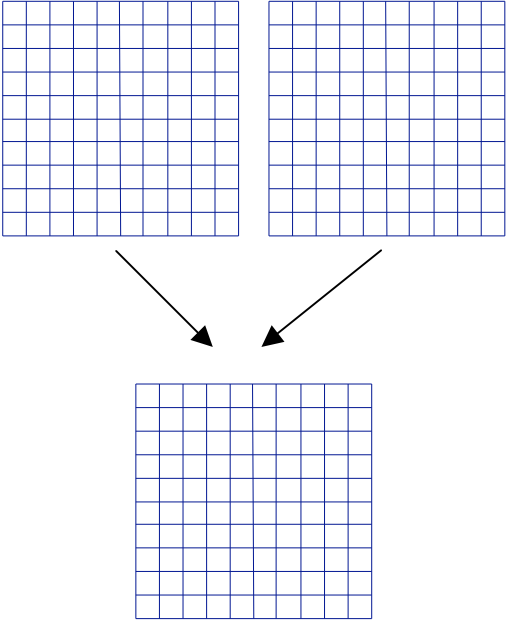
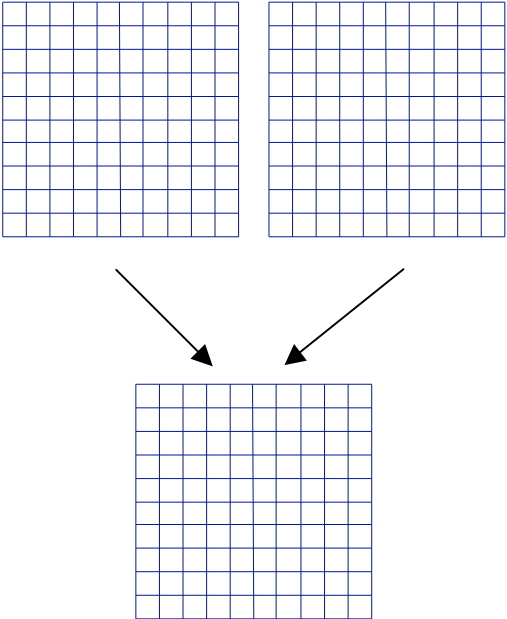


Directions: Read the story. Then read the questions. Decide if it is asking you to add or subtract. Then answer each of the questions.

<p>1. Danielle is watching a movie that is <math>2\frac{3}{4}</math> hours long. She has been watching it for <math>1\frac{1}{3}</math> hours. How much more time is left in the movie?</p>	<p>2. Zach got a new puppy that weighs <math>4\frac{1}{2}</math> pounds and his sister got a new kitten that weighs <math>2\frac{1}{8}</math> pounds. What is the total weight of the animals?</p>
<p>3. When Laurel started listening to her sister's iPod there was <math>\frac{2}{3}</math> of the power left in the battery. When she finished listening there was about <math>\frac{1}{6}</math> of the battery power remaining. How much of the battery's power did Laurel use?</p>	<p>4. What fraction of an hour has passed between 11:25 and 11:55?</p>

## Adding and Subtracting Decimals

Use the Addition-Subtraction boards to solve #1 and 2, then use only numbers and symbols to write the problem and solution in the third column

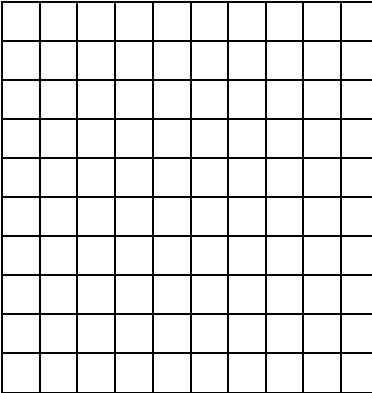
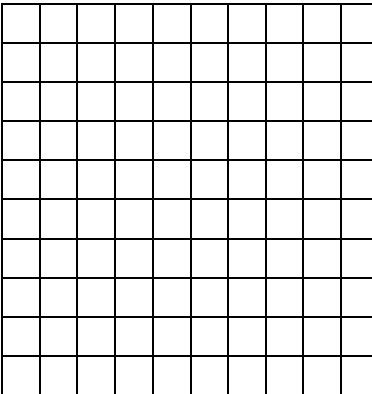
Problem	Picture	Symbolic Solution
1. Add: $0.32 + 0.09$	 <p>The diagram shows two 10x10 grids at the top. The left grid has 3 columns shaded (representing 0.32), and the right grid has 1 row shaded (representing 0.09). Two arrows point from the bottom-right corner of the left grid and the bottom-left corner of the right grid to a single 10x10 grid below them, indicating the process of adding the shaded areas.</p>	
2. Subtract: $0.83 - 0.54$	 <p>The diagram shows two 10x10 grids at the top. The left grid has 8 columns shaded (representing 0.83), and the right grid has 5 rows shaded (representing 0.54). Two arrows point from the bottom-right corner of the left grid and the bottom-left corner of the right grid to a single 10x10 grid below them, indicating the process of subtracting the shaded areas.</p>	



In each problem below, circle the larger number, then explain how you know it is larger.

Circle the larger number	Explain how you know it is larger.
3. $\frac{7}{8}$ or $\frac{5}{6}$	
4. 0.63 or 0.309	
5. 0.54 or $\frac{3}{7}$	

Using the given number, record the different ways to show it.

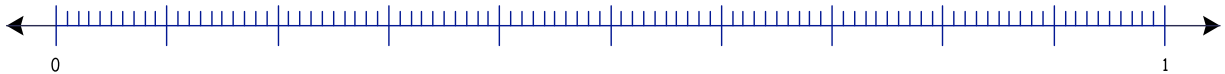
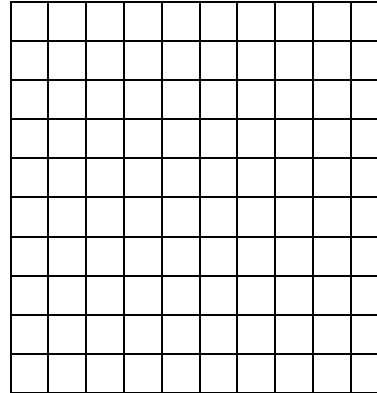
Picture	Describe 2 ways	Fraction Symbols	Decimal Symbol
6. 			0.71
7. 		$\frac{3}{100}$	

## Decimals with Grids and Number Lines

Using the grids and number lines below, show the representations of the given decimal.

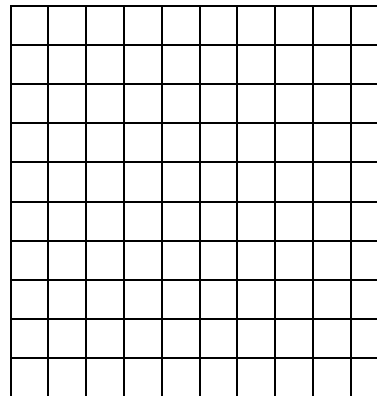
1.

0.675



2.

0.8



3. Which decimal is larger, 0.675 or 0.8? Explain how you know.

Given the fraction, write an equivalent fraction.

<p>4.</p> $\frac{3}{12} = \frac{\quad}{4}$ <p>Draw a picture of each fraction:</p> <div style="border: 1px solid black; height: 20px; width: 100%; margin-bottom: 5px;"></div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	<p>5.</p> $\frac{\quad}{8} = \frac{3}{4}$ <p>Draw a picture of each fraction:</p> <div style="border: 1px solid black; height: 20px; width: 100%; margin-bottom: 5px;"></div> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
<p>6.</p> $\frac{34}{40} = \frac{17}{\quad}$	<p>7.</p> $\frac{8}{16} = \frac{\quad}{2}$
<p>8.</p> $\frac{\quad}{15} = \frac{1}{3}$	<p>9.</p> $\frac{4}{20} = \frac{\quad}{5}$

**Solve the following problems. Show your work.**

<p>10. Tate is selling magazines for a school fundraiser, his class has set a goal. So far Tate has sold enough magazines to help his class get <math>\frac{2}{5}</math> of the way to their goal. A classmate, Mariama has sold enough to help the class get <math>\frac{1}{6}</math> of the way to their goal. How much of the class goal remains to be met?</p>
<p>11. Miguel's older brother tried to stump him on a math problem. He asked Miguel, "What should be added to <math>\frac{3}{4}</math> to get <math>\frac{15}{16}</math>?" Help Miguel solve the problem.</p>

## Number Lines and Decimals

Label each decimal on the number line.

.93



.05



.49



.52



.03



.75



.25

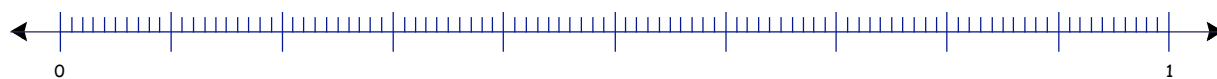


.33



Show each problem solution on the number line. Then check your solution by solving using symbols only

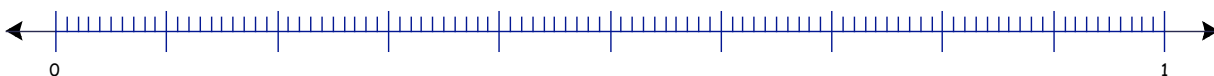
$$.93 - .05 =$$



$$.49 + .25 =$$



$$.33 - .03 =$$



$$.52 + .48 =$$



## Adding Fractions on the Number Line

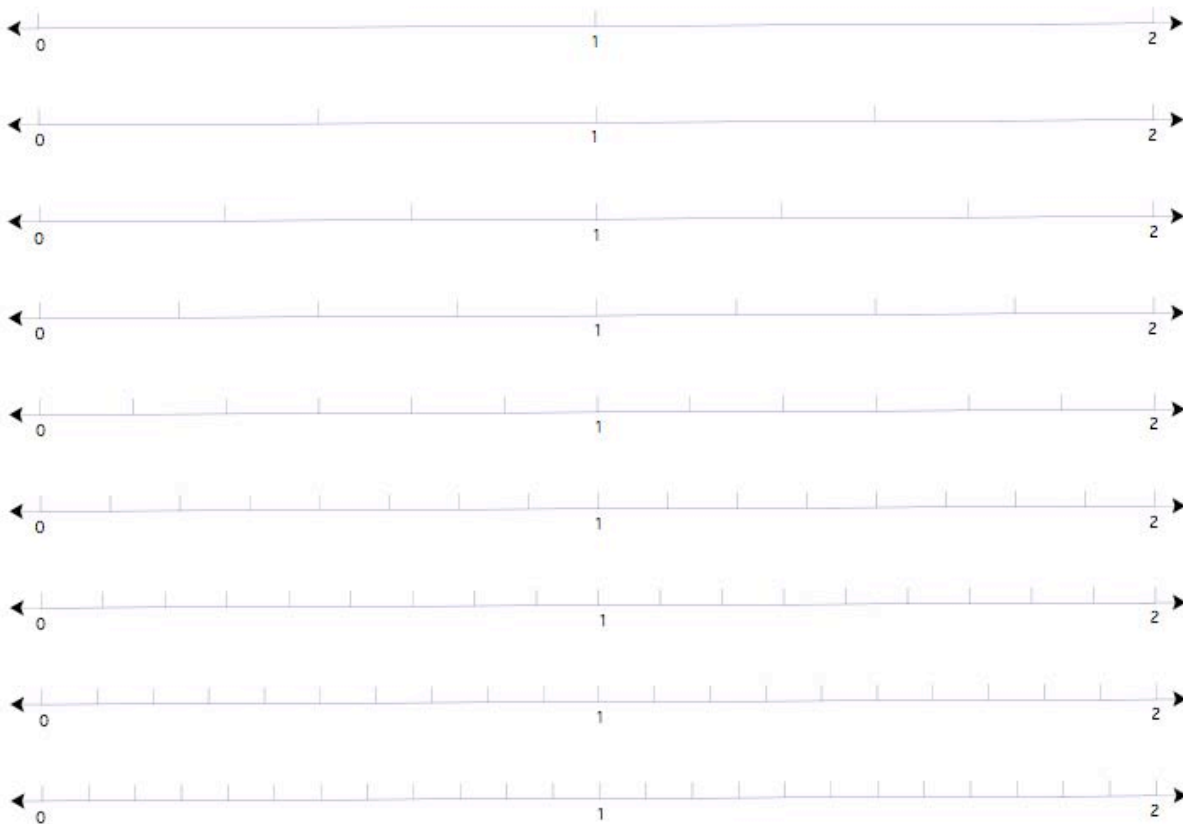
Show each problem on the best number line. Record your answer below each problem, showing the equivalent fractions you used.

a)  $\frac{5}{6} + \frac{1}{12}$

b)  $\frac{3}{2} + \frac{1}{3}$

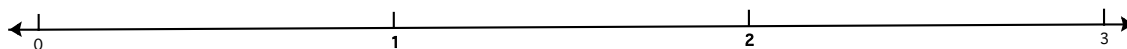
c)  $\frac{3}{5} + \frac{1}{10}$

d)  $\frac{1}{2} + \frac{3}{4}$

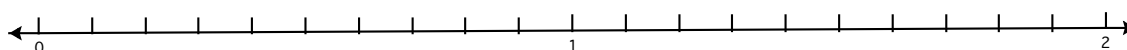


Show each fraction on the number line provided.

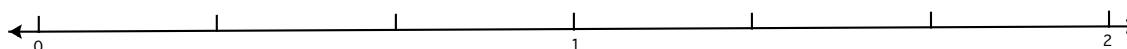
$1\frac{2}{3}$



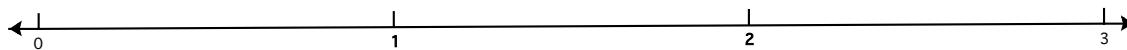
$\frac{4}{5}$



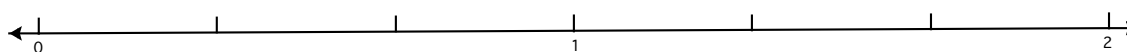
$1\frac{4}{6}$



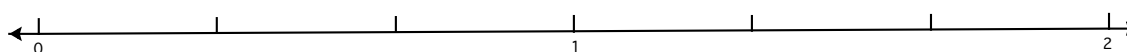
$2\frac{2}{6}$



$\frac{5}{6}$



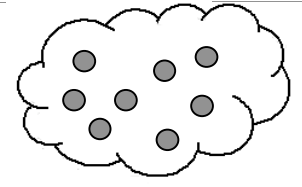
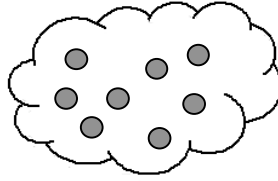
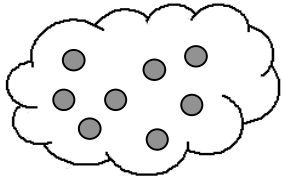
$1\frac{4}{15}$



## Multiplying Fractions

Write a multiplication sentence for each picture shown below. Each cloud contains a group.

1. Unit is 



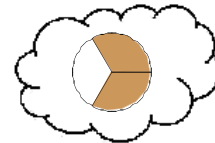
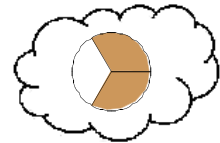
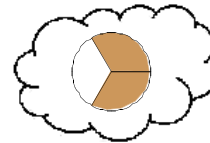
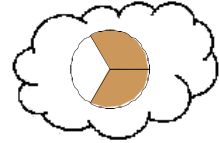
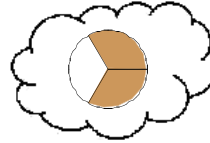
Words:

\_\_\_\_\_ groups of \_\_\_\_\_

Multiplication Sentence:

\_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_

2. Unit is 



Words:

Multiplication Sentence:

Draw a picture for each multiplication sentence then complete the sentence.

3.

$$3 \times \frac{1}{2} =$$

4.

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



Show how to find a solution by drawing a picture, writing out in words, and writing a multiplication sentence.

5. Paola reads for  $\frac{3}{8}$  of an hour each day for 5 days. How many total hours does she read?

Picture:

Words:

Multiplication Sentence:

6. Molly puts  $\frac{2}{3}$  a teaspoon of sugar in her cereal each morning for 7 days. How much sugar does she use in all?

Picture:

Words:

Multiplication Sentence:

### Review

7. Show the steps to find the sum:

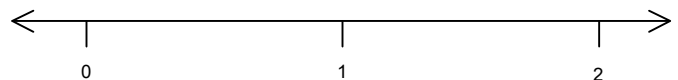
$$\frac{2}{3} + \frac{7}{12}$$

8. Show the steps to find the difference.

$$\frac{3}{5} - \frac{1}{4}$$

9. Show how to use a number line to find the answer to the problem:

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



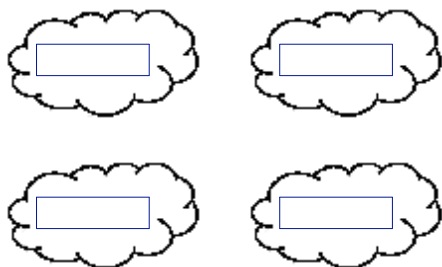
## Multiplying Fractions

(whole number x fraction)

Draw a picture and write a multiplication sentence for the given problems.

1. 4 groups of  $\frac{2}{5}$

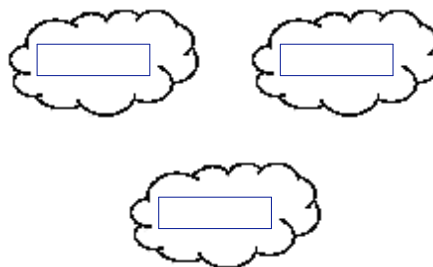
Picture:



Multiplication Sentence:

2. 3 groups of  $\frac{1}{2}$

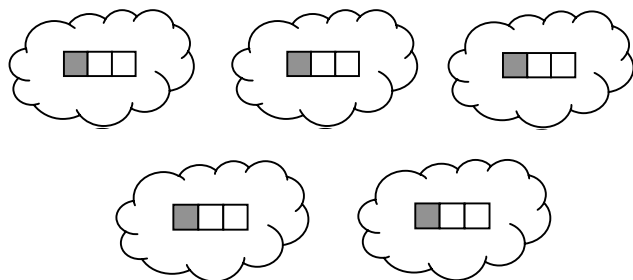
Picture:



Multiplication Sentence:

Write a multiplication sentence for each picture shown below. Each cloud contains a group.

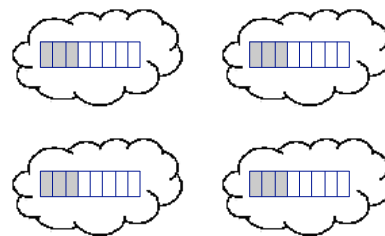
3. Unit is



Words:

Multiplication Sentence:

4. Unit is



Words:

Multiplication Sentence:

Write a story problem to represent each sentence below then draw a picture to find the answer and complete the sentence.

5.  $2 \times 6 = \underline{\hspace{2cm}}$

6.  $5 \times \frac{2}{3} = \underline{\hspace{2cm}}$

**Review**

7. a) Estimate the difference:

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

b) Show the steps to find the exact difference:

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

8. a) Estimate the sum:

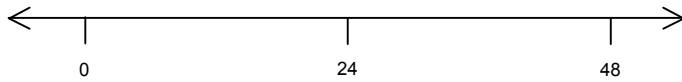
$$2\frac{4}{9} + \frac{2}{3} =$$

b) Show the steps to find the exact sum:

$$2\frac{4}{9} + \frac{2}{3} =$$

## Multiplying Fractions

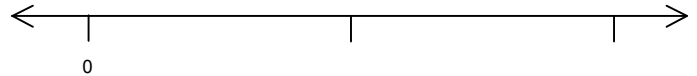
1. Wayne earns \$24 an hour. How much will he make if he works  $\frac{5}{6}$  of an hour?



Multiplication Sentence:

<u>          </u>	x	<u>          </u>	=	<u>          </u>
# of		amount		amount
hours		earned		of
worked		per		money
		hour		earned

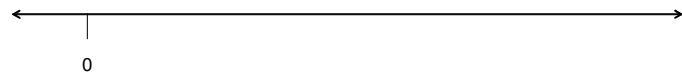
2. Rachael earns \$8 an hour selling popcorn? How much will she earn if she works for  $\frac{3}{4}$  of an hour?



Multiplication Sentence:

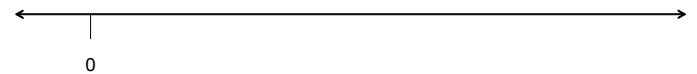
<u>          </u>	x	<u>          </u>	=	<u>          </u>
# of		amount		amount
hours		earned		of
worked		per		money
		hour		earned

3. There are 24 students that went camping.  $\frac{3}{4}$  of the students are girls. How many girls went camping?



Multiplication Sentence:

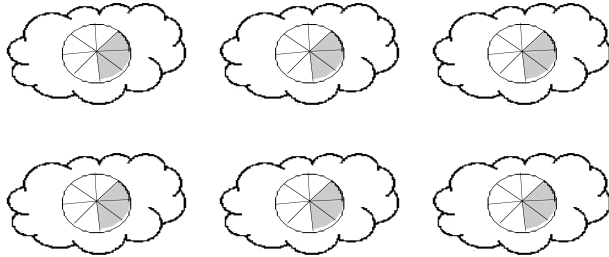
4. Daniel earns \$40 an hour building Legos. How much will he earn if he works  $\frac{7}{4}$  hours?



Multiplication Sentence:

5. Write a multiplication sentence for the picture shown below. Each cloud contains a

group. Unit is



Words:

\_\_\_\_\_ groups of \_\_\_\_\_

Multiplication Sentence:

6. Show how to find a solution by drawing a picture, writing out in words, and writing a multiplication sentence.

Winona puts  $\frac{3}{4}$  a teaspoon of sugar in her cereal each morning for 5 days. How much sugar does she use in all?

Picture:

Words:

Multiplication Sentence:

Draw a picture for each multiplication sentence then complete the sentence.

7.

$$15 \times \frac{4}{5} =$$

8.

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

9. a) Place an x on the number line to estimate the sum:

$$\frac{3}{4} + \frac{7}{8} =$$



- b) Show steps to find the exact sum:

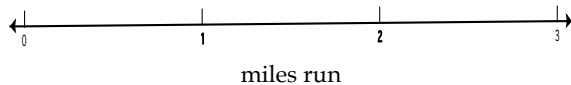
$$\frac{3}{4} + \frac{7}{8} =$$

## Multiplying Fractions on Number Lines

Use a double number line and write a multiplication sentence to answer each of the questions below.

1. For the track fundraiser, runners earn \$6 for every mile they run. How much money will Sara earn if she runs  $2\frac{2}{3}$  miles?

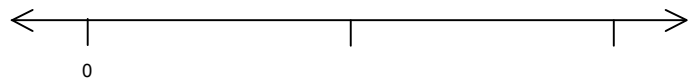
amount of money earned (\$)



Multiplication Sentence:

$$\begin{array}{c} \text{# of} \\ \text{miles run} \end{array} \times \begin{array}{c} \text{amount} \\ \text{earned} \\ \text{per mile} \end{array} = \begin{array}{c} \text{amount} \\ \text{of money} \\ \text{earned} \end{array}$$

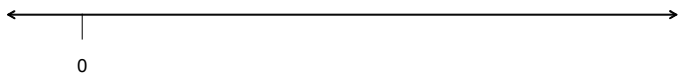
2. JD travels 16 miles for every hour he rides his bike. How far will JD travel if he rides for  $1\frac{3}{4}$  hours?



Multiplication Sentence:

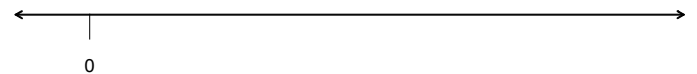
$$\begin{array}{c} \text{# of} \\ \text{hours} \\ \text{riding} \end{array} \times \begin{array}{c} \text{miles} \\ \text{traveled} \\ \text{per hour} \end{array} = \begin{array}{c} \text{amount} \\ \text{of miles} \\ \text{traveled} \end{array}$$

3. There were 27 pizzas ordered for the class party. If  $\frac{2}{9}$  of the pizzas were vegetarian, how many vegetarian pizzas were ordered?



Multiplication Sentence:

4. It costs \$8 each hour to ice skate at the rink. If Manuel skates for  $1\frac{3}{4}$  hours, how much will it cost?

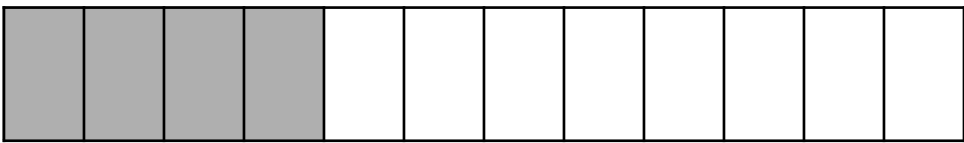



Multiplication Sentence:

**Review.**

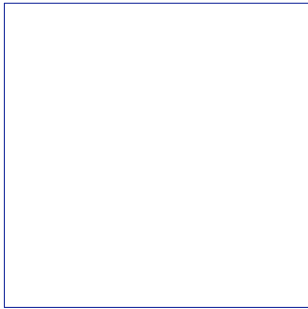
Multiplication Sentence	Words	Picture
$3 \times \frac{2}{3} = \underline{\hspace{2cm}}$		
	5 groups of $\frac{1}{4}$	
$4 \times \frac{3}{2} = \underline{\hspace{2cm}}$		

Partition the blank strip to show a fraction equivalent to the fraction shown on the strip above it. Think in terms of paper folding. How did the strip look before the last fold?

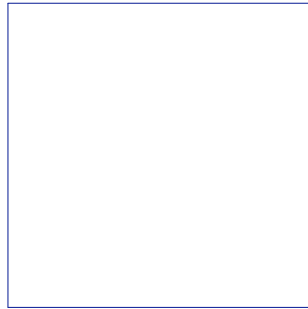
$\frac{4}{12}$	
$\frac{\quad}{3}$	

## Multiplying Fractions

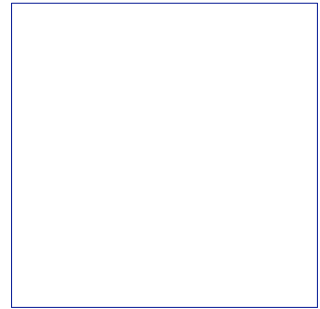
1. Shade in the fractional amounts of patty-paper pictures shown below.



$$\frac{3}{8}$$



$$\frac{1}{3}$$



$$\frac{3}{5}$$

2. Max finds  $\frac{1}{3}$  of a square cake out on the counter of his kitchen. He eats  $\frac{7}{8}$  of this piece. What fraction of the entire cake did Max eat? Show how you can find the answer by shading in the square below then writing a multiplication sentence to show solution.



Multiplication Sentence:

**cake**

3. Write the multiplication sentences as word phrases and draw pictures to show answers.

a)  $\frac{1}{3} \times \frac{1}{4} =$

\_\_\_\_\_ group of  $\frac{1}{4}$



b)  $\frac{2}{3} \times \frac{1}{3} =$

\_\_\_\_\_ groups of \_\_\_\_\_



c)  $\frac{3}{4} \times \frac{3}{5} =$

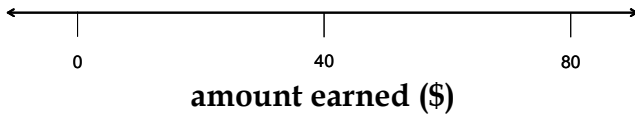
\_\_\_\_\_ groups of \_\_\_\_\_





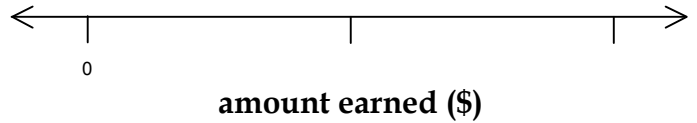
**Solve on the number line and write a multiplication sentence that shows how to find the answer.**

4. Xander earns \$40 an hour. How much will he make if he works  $\frac{3}{8}$  of an hour?



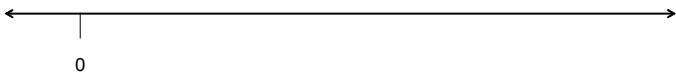
Multiplication Sentence:

5. Sophie earns \$32 an hour selling popcorn? How much will she earn if she works for  $\frac{7}{8}$  of an hour?



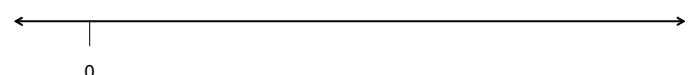
Multiplication Sentence:

6. There are 24 students that went camping.  $\frac{5}{12}$  of the students are girls. How many girls went camping?



Multiplication Sentence:

7. Taurean earns \$28 an hour building Legos. How much will he earn if he works  $\frac{7}{4}$  hours?



Multiplication Sentence:

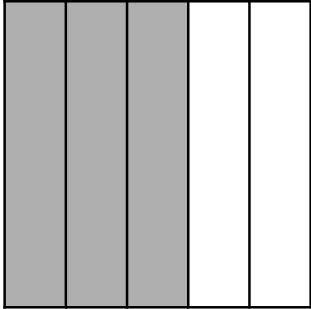
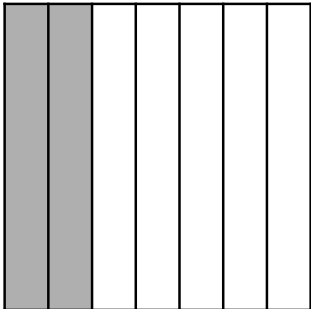
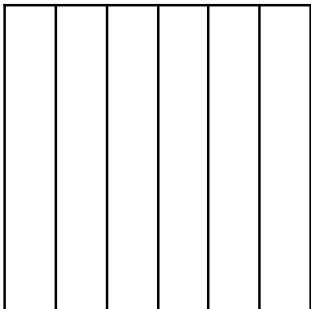
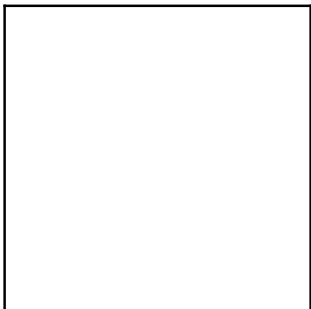
**Draw a picture for each multiplication sentence then complete the sentence.**

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

9.  $\frac{3}{7} \times 21 =$

## Multiplying Fractions

1. Fill in the table below.

Multiplication Problem	Picture	$\frac{\text{\# of darkly shaded pieces}}{\text{\# of total pieces in square}}$	Fraction of square shaded dark
$\frac{3}{5} \times \frac{1}{4}$		-----	
$\frac{2}{7} \times \frac{1}{3}$		-----	
$\frac{5}{6} \times \frac{1}{2}$		-----	
$\frac{3}{4} \times \frac{3}{4}$		-----	

2. Use the patterns from the table to find a shortcut to do these problems.

a)  $\frac{2}{8} \times \frac{3}{5} =$

b)  $\frac{6}{7} \times \frac{3}{4} =$

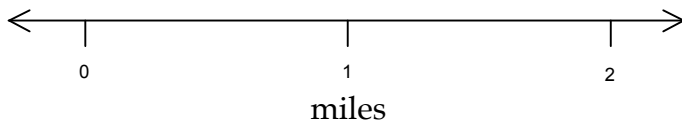
**Review**

3. Shadow ate $\frac{3}{4}$ of a brownie. A whole brownie has 120 calories. How many calories did Shadow eat?	4. Ginger uses $\frac{1}{3}$ cup of flour for a cookie recipe. She uses $\frac{3}{8}$ cups of flour for her pancake recipe. How much flour does she use in all?
5. Find the sum:  $0.36 + 0.40 =$	6. Order the numbers from smallest to largest.  $0.07, \frac{1}{100}, 0.1$
7. In the long jump, Malik jumped $5\frac{1}{6}$ feet and Austin jumped $4\frac{2}{3}$ feet. How much further did Malik jump than Austin?	8. When asked to estimate $4\frac{3}{4} - 2\frac{3}{8}$ , Michelle thought the answer would be greater than 2 and Alicia thought it would be less than 2. Who is correct, and why?

## Multiplying Fractions

Find the exact length of the runs below using the number line and write the multiplication sentence that shows how far each person runs.

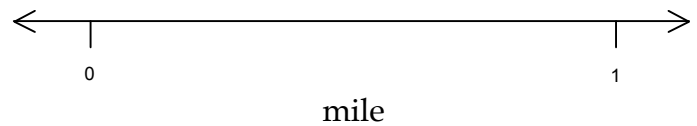
1. Winona runs down Oakland Avenue. Each block is  $\frac{1}{3}$  of a mile long. She runs  $\frac{1}{2}$  of a block before she gets tired and stops. How far in miles does she run?



Multiplication Sentence:

_____	x	_____	=	_____
# of blocks run		length of each block		total length of run

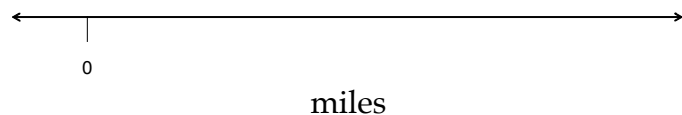
2. Rachael runs along 46<sup>th</sup> street. Each block is  $\frac{1}{4}$  of a mile long. She runs  $\frac{2}{3}$  of a block before stopping. How far in miles does she run?



Multiplication Sentence:

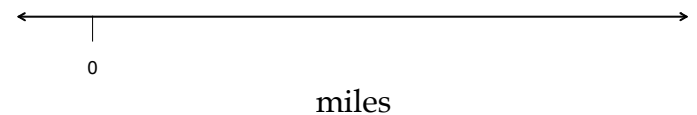
_____	x	_____	=	_____
# of blocks run		length of each block		total length of run

3. Bryce runs along Minnehaha Parkway. Each block is  $\frac{1}{2}$  a mile. He runs  $\frac{2}{3}$  of a block before stopping. How many miles does he run?



Multiplication Sentence:

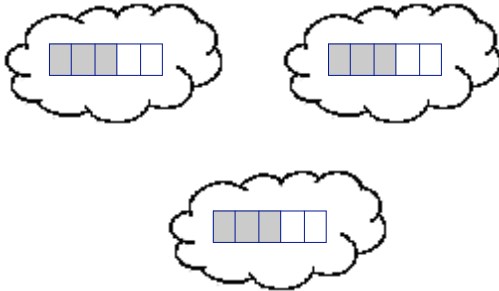
4. Ramla sprints  $\frac{1}{3}$  of a  $\frac{1}{4}$  mile track. How much of a mile does she run?



Multiplication Sentence:

5. Write a multiplication sentence for the picture shown below. Each cloud contains a

group. Unit is



Words:

\_\_\_\_\_ groups of \_\_\_\_\_

Multiplication Sentence:

6. Laura earns \$8 an hour. How much does she earn if she works  $\frac{1}{4}$  of an hour? Show your answer on the number line and write a multiplication sentence.



Multiplication Sentence:

Multiply the following fractions by drawing on the squares.

number	symbols	picture	use algorithm to find answer
7.	$\frac{2}{5} \times \frac{1}{3}$		$\frac{2}{5} \times \frac{1}{3} =$
8.	$\frac{4}{5} \times \frac{3}{7}$		$\frac{4}{5} \times \frac{3}{7} =$

## Multiplying Fractions

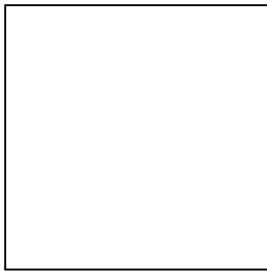
Show how to solve the following problems using patty paper, the number line and your rule.

1. Chloe has been hoping for a lot of snow. The weather report said that  $\frac{4}{5}$  of an inch of snow is falling every hour. Suppose it only snows for  $\frac{3}{4}$  of an hour. How much snow will fall?

Patty Paper:

Number Line:

Rule:

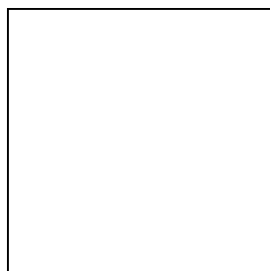


2. Brynn's new puppy is gaining  $\frac{5}{6}$  of a pound every month. She wants to know how much weight her puppy will gain in  $\frac{2}{3}$  of a month.

Patty Paper:

Number Line:

Rule:



3. In the last problem, why does it make sense that the denominator in the answer is eighteenths?

Match each patty paper problem with its multiplication sentence.

4.  $(1/4) \cdot (\frac{3}{4})$

a.  $\frac{5}{6} \times \frac{4}{5}$

5.  $(\frac{2}{3}) \cdot (\frac{3}{8})$

b.  $\frac{1}{4} \times \frac{3}{4}$

6.  $(\frac{5}{6}) \cdot (\frac{4}{5})$

c.  $\frac{2}{3} \times (3\frac{1}{2})$

7.  $(\frac{2}{3}) \cdot (3\frac{1}{2})$

d.  $\frac{2}{3} \times \frac{3}{8}$

8. Find the answers to the multiplication sentences in #4-7.

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

$\frac{2}{3} \times \frac{3}{8} =$

$\frac{5}{6} \times \frac{4}{5} =$

$\frac{2}{3} \times (3\frac{1}{2}) =$

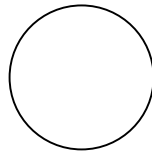
## Dividing Fractions

Solve the following problems by drawing a picture.

1. If it takes  $\frac{2}{3}$  of an hour to play a board game. How many games can Michael play in 2 hours?

2. There are  $4\frac{1}{2}$  ounces of tea leaves in Salma's house. If  $\frac{1}{4}$  of an ounce is needed to make a serving, how many servings of tea can Salma make?

3. How many  $\frac{1}{4}$ 's are in  $\frac{6}{8}$ ?

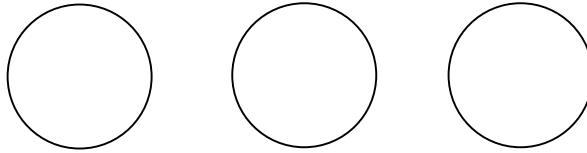


4. Explain how you figured out your answer to #3.

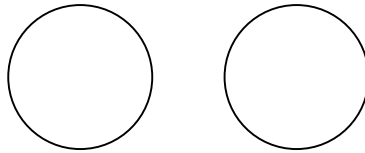


**Use a picture to solve each problem.**

5. Nina has to practice piano for 3 hours this week. She likes to practice for  $\frac{3}{4}$  of an hour at a time. How many times will Nina have to practice to make sure she practices for 3 hours?



6. Jabarti has been watching television for  $1\frac{1}{4}$  hours. If each television show is  $\frac{1}{2}$  an hour long, how many shows has he watched?



7. It takes Tate about  $\frac{3}{5}$  of an hour to put together a puzzle. How many puzzles can he put together in 2 hours?



8. Explain how you figured out #7.

## Dividing with Fractions

Solve each problem by drawing a picture or number line. Then write the division sentence and the division sentence with common denominators.

1. Kameron and Debbie want to make 3 batches of cookies to give to their friends. If each batch takes them about  $\frac{3}{4}$  of an hour to make, how many hours will it take them to bake all 3 batches?

Picture:

Division Sentence:

Division Sentence with Common Denominators:

2. Asad has  $\frac{5}{6}$  of the battery power left on his portable dvd player. Each movie uses about  $\frac{1}{3}$  of the battery power. How many movies can Asad watch before there is no more power left in the battery?

Picture:

Division Sentence:

Division Sentence with Common Denominators:

3. Sophea wants to make as many pans of brownies as she can. Each batch calls for  $\frac{3}{4}$  cup of chocolate chips. If Sophea has 2 cups of chocolate chips, how many pans of brownies can she make?

Picture:

Division Sentence:

Division Sentence with Common Denominators:

For each problem give an estimate, then answer the question using a division sentence. Then draw a picture to justify.

4. Helena goes to the arcade with \$4. Her favorite game costs  $\frac{3}{4}$  of a dollar to play. How many times can she play her favorite game?

Estimate

Number Sentence

Picture

5. How many  $\frac{5}{6}$ 's are there in  $3\frac{2}{3}$ ?

Estimate

Number Sentence

Picture

6. Katie wants to make costumes for the school play. She has  $\frac{7}{8}$  of a yard of one of the fabrics that she will need. If each costume calls for  $\frac{3}{4}$  of a yard of this fabric, for how many costumes can she use this fabric?

Estimate

Number Sentence

Picture