ELA Answers: Week 8 (FREEDOM)

Day 1: Step 4: *Questions about Refugee in America.*	1. The speaker says that the word liberty "almost make(s) me cry." Why might this be true? *He says "if you knew what I had known"...communicating that he has experienced the injustice of a country that did not give him the same liberties, freedoms and rights that it gave whites.* 2. What might the sad feelings in the second stanza say about the possibilities and the reality of liberty based on the perspective of the speaker? *The poem was written in 1947. At this time, the poet most likely was feeling the injustice of a system that did not give African Americans the liberties or rights that were granted to others.* 3. Freedom and liberty are words that are often associated with each other, but they do not mean exactly the same thing. How is liberty different from freedom? *Answers will vary.* *Freedom is used as meaning: without physical restraint; liberty represents a person's rights and control over one's own actions. The use of freedom in the first stanza indicates that the release from the bonds of slavery and a new physical freedom that the narrator's ancestors did not have. However, liberty has not yet been given to the African American community. Freedom has been a release from the heavy chains, but the narrator still does not have complete control of his own actions.* 4. Describe in a sentence or two what you think the theme, or message, of "Refugee in America" is. What evidence in the text helps convey the theme or message? *Answers will vary. The theme of the poem is the struggle of blacks to achieve equality in early twentieth century America. There existed a dual reality for blacks. They were free from the bondage of slavery, yet were not fully liberated from the effects of it due to Jim Crow laws and overt racism across America. The message the poem sends is clear; regardless of the words applied to a group of people, it is the actions which compel those ideas that matter.* 5. What is a refugee? How can someone be a refugee in his or her own country? *A refugee is a person who has been forced to leave their country in order to escape war, persecution, or natural disaster--it is someone who is displaced because they do not get some basic human rights. Even though they were living in the U.S., African Americans were not afforded equal rights.* 6. Why do you think Hughes titled his poem "Refugee in America" and not "Words Like Freedom," as it is often called? *Blacks felt like refugees despite living and having freedom, they were still seeking equal rights and liberation.*
Day 1 : Step 5: Interpretations of Quotes.	*Answers will vary*

Day 2: Answers to questions for the poem Sympathy.	1. Read the first stanza again. How does Dunbar describe the world outside of the cage? The world outside of the cage is described as near paradise...where "the sun is bright on the upland slopes", and "the wind stirs soft through the springing grass, And the river flows like a stream of glass" Birds are chirping and the flower buds are opening. You sense a beautiful, free open space. 2. Read the second stanza. What is the caged bird doing? Is this the first time the bird has done this? How do you know? T*he caged bird wants out of his cage so much that he beats his wings against the bars on the cage. We know he has done this repeated because Dunbar says that the caged bird suffers " pain still throbs in the old, old scars, And they pulse again with a keener sting" letting us know that he has done this before and that his wings are already scarred from having done this.* 3. Reread stanza 3. Why does the caged bird sing? *He is praying to be free.* 4. Why does Paul Laurence Dunbar start and end each stanza with "I know…" What is he communicating to the reader? *He is communicating that he identifies with the caged bird...he understands how he feels because he also does not have real freedom.*

Day 2: Answers to questions for Caged Bird	1. What is Angelou describing in the first stanza? What imagery (descriptive language) does she use to describe the caged bird? *The imagery in the first stanza mostly gives you a sense of freedom/and wind: Words like "wind" , "floats downstream", " current", "sky".* 2. Re-read Stanza 2. How is the bird in the cage different--both physically and emotionally? Unlike the first stanza, the words give a sense of being trapped or tied down. *Stalks, narrow cage, bars of rage, wings are clipped , his feet are tied* 3. How does the caged bird sing? What does he sing about? *He longs for freedom...it's a sad and fearful song...wishing for something he doesn't have.* *a fearful trill* *of things unknown* *but longed for still* 4. At the end of stanzas 1 and 4, Angelou describes the free bird by saying he "dares to claim the sky" and "names the sky his own". What do these actions say about the free bird? *The free bird is more confident and powerful. He can take chances and risks...He can call the sky--or this country you could say--his own because he is free to do that...not the caged bird.* 5. In addition to being in a cage, what else keeps the caged bird from being free? *his wings are clipped and his feet are tied* 6. Draw out the image of the caged bird vs. the free bird in Angelou's poem. Answers will vary but some of the imagery described for each is listed below to help you assess their understanding.

Sympathy	Caged Bird
I the caged bird beats his wing Till its blood is red on the cruel bars; he must fly back to his perch and cling And a pain still throbs in the old, old scars When his wing is bruised and his bosom sore.. he beats his bars a ... a prayer that he sends from his heart's deep core, But a plea, that upward to Heaven he flings—	a bird that stalks down his narrow cage can seldom see through his bars of rage his wings are clipped and his feet are tied the caged bird sings with a fearful trill a caged bird stands on the grave of dreams his shadow shouts on a nightmare scream

1. Think back to BOTH poems. What is the metaphor (a metaphor is a symbolic comparison) that they both use in their poem? What does it symbolize?
They both use the metaphor of a caged bird...the caged bird represents African Americans who do not have full freedoms/equality.

2. Why is the caged bird a strong symbol for what they are trying to say?
A caged bird is unable to move about freely...to fly..the ultimate expression of

	freedom.

Day 2. : Complete Graphic Organizer	*Answers will vary..but below are the descriptive words used in each poem. Students should illustrate these words--making them word art.*
	<table><tr><td>*Sympathy*</td><td>*Caged Bird*</td></tr><tr><td>*Beats, (must) fly, cling, Throb, Sends Prays, flings*</td><td>*Clipped, tied, sings, stalks, see, longs, Stands, shouts,*</td></tr></table>

Day 3, Step 2 : Answers to Questions about Apartheid	1. Describe what the land Act of 1913 did to black citizens in South Africa. *The law forced black citizens to live on special reserves that were set aside for them and made it against the law for them to work as sharecroppers.*
	2. Apartheid separated South Africans into Whites, Blacks, Coloureds (mixed race), and Asian (meaning Indians and Pakistanis). How do you think this separation was used to maintain the system of oppression when Whites were the minority? *The separation ensured that different groups--all which were being oppressed by the much smaller Afrikaaner (white) population--would see themselves as different or apart from the other other groups so they would not unite against the oppression.*
	3. What was Nelson Mandela accused of and jailed for? Treason...Nelson Mandela led many of the protests but was then accused of treason and had to go 'underground' to avoid arrest. When the officials did locate him in 1961, he was arrested and thrown into prison. T
	4. When was Nelson Mandela released? How many years had he served in prison? *Nelson Mandela was released from prison in 1990 since being in prison since 1961...so he was in prison between 27-30 years looking at different measurements.*
	5. In your own words, explain what caused the end of Apartheid. *Other countries began to pressure South Africa through boycotts and sanctions against South Africa because of Apartheid. So there was a lot of economic pressure put on the country by other countries throughout the world.*
	6. What happened to Mandela after he was released from prison? *He became president.*

Day 3 : Answers to questions about Mandela Looks back on **Nelson Mandela Reflects on Working Toward Peace**	1. How did Mandela's idea of freedom change when he was a young man? What freedoms did he want then? Were these freedoms available to him? A*s a child he says he was "born free-free in every way that I could know" He was " Free to run in the fields near my mother's hut, free to swim in the clear stream that ran through my village, free to roast mealies under the stars and ride the broad backs of slow moving bulls." As long as I obeyed my father and abided by the customs of my tribe, I was not troubled by the laws of man or God. Children only want that freedom to play and do what they want, so he didn't see himself as not free.*
	As young man, he "began to learn that my boyhood freedom was an illusion, when I discovered as a young man that my freedom had already been taken from me, that I

began to hunger for it."   He wanted to : the transitory freedoms of being able to stay out at night, read what I pleased, and go where I chose." but he didn't have those freedoms because there were curfews and limits on travel according to race.   Later, as a young man in Johannesburg, he wanted the "basic and honorable freedoms of achieving my potential, or earning my keep, of marrying and having a family-the freedom not to be obstructed in a lawful life" and again, didn't see himself as having that.

2. In the third paragraph, what shift took place in Mandela's thinking about freedom? *How does this show that he was maturing? He says: "But then I slowly saw that not only was I not free, but my brothers and sisters were not free. I saw that it was not just my freedom that was curtailed, but the freedom of everyone who looked like I did."   So he realizes that others are not free either and this moves him to become an advocate.*

3. In the fourth paragraph, how does his view of freedom evolve even more? Do you agree with him? Why or why not? *When he is in prison, he starts to think about what freedom really means and he wants freedom for everyone...he starts to believe that when there is a system of oppression, everyone is trapped in it..both the oprressed and the oppressor. Answers about their opinions will vary.*

4. In the fifth and sixth paragraphs, what does Mandela say about freedom now in South Africa? *The key quote here is: For to be free is not merely to cast off one's chains, but to live in a way that respects and enhances the freedom of others. Which means that it is not enough to be free but you have to be continuously working towards the freedom and dignity of ALL people.*

5. What metaphor does Mandela use in the final paragraph, and is it effective in conveying his message? Why or why not? *"I have walked that long road to freedom. I have tried not to falter; I have made missteps along the way. But I have discovered the secret that after climbing a great hill, one only finds that there are many more hills to climb. I have taken a moment here to rest, to steal a view of the glorious vista that surrounds me, to look back on the distance I have come." The road is the process and/or fight for freedom and equality. The hills are challenges and the vista is the wonderful future to come.*

Day 4: Answers to When Natural Hair Wins, Discrimination in School Loses	Answers will vary
Answers to: Students are waging war on sexist and racist school dress codes — and they're winning	Answers will vary.

Day 5: Answers to question: Case Study Background: USA PATRIOT Act (2015)	Answers are all opinion questions--will vary.

Week 1 Lesson Summary

Day 1	• Word Problems: Sharecropping: Freedom, or not • Skills: Fractions
Day 2	• Word Problems: Chicago Bound: A Taste of Freedom • Skills: Fractions
Day 3	• Word Problems: College Bound: Freedom to Grow and Learn • Skills: Fractions
Day 4	• Word Problems: Earlonne Woods: Freedom through Podcasting • Skills: Fractions
Day 5	• Word Problems: Frosted Flakes, Pop Tarts and Milk: Freedom to Eat, A lot • Skills: Fractions

What is this lesson about?: Today you will work on fractions.

Warm Up and Review Problems:

Many freed slaves ended up working as small farmers, calles sharecroppers, often on the same land they worked when they were held in bondage. For many, this life was only modestly better than when enslaved. They were 'free' but often worked all year only to finish out either still owing the landowner money, or only making enough money to survive for another year. Consider this example:

Kenneth, his wife and two children were 'freed' shortly after the Civil War. Unable to move or find work elsewhere, they agreed to work as a sharecropper with their former owner, on a farm/plantation in South Carolina.

Kenneth rented his land, purchased his seeds from and sold back his crops to his former slave owner. Use the chart below to answer some questions about Kenneth.

Expenses-
Annual 'rent': $1,200 ($100/month)   *1200*
Cost of seeds (tobacco, corn): $125   *125*
Cost to 'rent' horse, plow, etc, $120 ($20/month for 6 months)   *120*
                                                    1445

Sales-
Sale of cotton and tobacco: $2,400 total

At the end of a year, how much did it cost Kenneth to farm the land, plant and harvest the two crops?   *$1445*

How much did he make in 'profit' once he sold his crops and paid these bills? *$998*

How much is that 'per month' (example: divide by 12 months) *Approx $80/month*

What are some things that Kenneth would need to use that money for, to survive?
     His own food, supplies, day to day living

What percent (remember from last lessons) of his total sales did he spend on renting a horse and plow?   *120/2400 = 5%*

What would happen to Kenneth if there was a drought or some sort of crop failure--if he lost 25% of his revenue, how much would make selling his crop? Would he be able to pay all of his bills if this happened?   *2400 x .25 = $600   2400-600 = 1800/   very close*

Activities/Fraction Problems: Complete the following fractions worksheets

1800
-1445
$365²

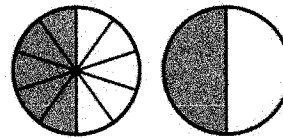# *Understand* Equivalent Fractions

4.NF.A.1

Think It Through

What's really going on when fractions are equivalent?

Equivalent fractions name the same part of a whole.

Think about how you could explain to a third grader why $\frac{5}{10}$ and $\frac{1}{2}$ are equivalent.

You could shade area models to show $\frac{5}{10}$ and $\frac{1}{2}$.

Both models at the right are the same size. Both show the same amount shaded, so $\frac{5}{10}$ and $\frac{1}{2}$ are equivalent fractions.

Think Equivalent fractions show the same amount in different ways.

Fractions can be written many different ways by changing the number of equal parts in the whole.

Start with a rectangle divided into 2 equal parts. Shade one part to show $\frac{1}{2}$.

$\frac{1}{2}$
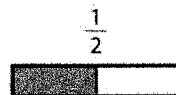
Divide the same rectangle into 4 equal parts. There are 2 times as many parts and 2 times as many parts shaded. Now 2 out of 4 equal parts are shaded.

$\frac{2}{4}$
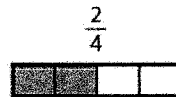
But, your rectangle still shows $\frac{1}{2}$ shaded.

Divide the original rectangle into 8 equal parts. There are 4 times as many parts and 4 times as many parts shaded. Now 4 out of 8 equal parts are shaded. Your rectangle still shows $\frac{1}{2}$ shaded.

$\frac{4}{8}$
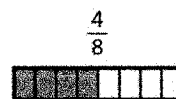
So, $\frac{1}{2}$, $\frac{2}{4}$, and $\frac{4}{8}$ are all equivalent fractions, since they name the same part of a whole.

✏️ **Underline** the part that explains how to write a fraction a different way.
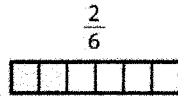
3

Think Every fraction has many equivalent fractions.

You can start with any fraction and change the way the whole is divided
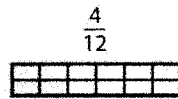to get an equivalent fraction.

This model is divided into 3 equal parts.
The shaded section shows the fraction $\frac{1}{3}$.

$\frac{1}{3}$

Think of 2 times
as many as $\times$ 2.
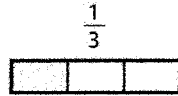
$\frac{2}{6}$ has 2 times as many parts shaded and
2 times as many equal parts.

$\frac{2}{6}$

$\frac{4}{12}$ has 4 times as many equal parts and
4 times as many parts shaded as $\frac{1}{3}$.

$\frac{4}{12}$

All three models have the same shaded area. So, $\frac{1}{3}$, $\frac{2}{6}$, and $\frac{4}{12}$ are equivalent fractions.

You can also multiply the numerator and denominator of $\frac{1}{3}$ by the same number to
get an equivalent fraction.

2 times as many equal parts and 2 times as many parts shaded:

$$\frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

4 times as many equal parts and 4 times as many parts shaded:

$$\frac{1 \times 4}{3 \times 4} = \frac{4}{12}$$

▶ Reflect

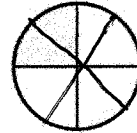**1** Explain how you can find equivalent fractions.

Multiply both the top & bottom # by same #

Think About Equivalent Fractions

Let's Explore the Idea Dividing models is one way to think about equivalent fractions.

2 The model shows $\frac{1}{4}$. How many equal parts make up the whole? __4__

Use a ruler to draw 2 more lines to make 8 equal parts.

3 Compare the 4 equal parts to the 8 equal parts. How many times as many parts are there now? __2x__

Now how many parts are shaded? __2x__

Why are there two times as many parts shaded as there were in the $\frac{1}{4}$ model?

__EACH PIECE CUT into 2__

Use the model above to answer problems 4 and 5.

4 If 3 of the original 4 parts were shaded, how many of the 8 parts would be shaded? __6__

5 If all 8 parts were shaded, how many of the original 4 parts would be shaded?
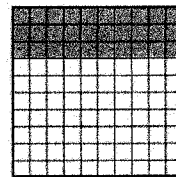
__4__

Now try these two problems.

6 Draw a model to show $\frac{2}{3}$ and then divide it into a different number of parts to show an equivalent fraction.
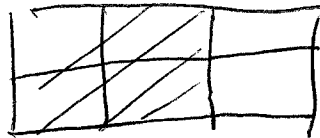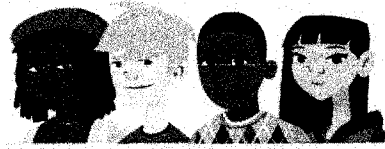
$2/3 = 4/6$

7 This model shows $\frac{30}{100}$. If the model had only 10 equal parts, how many would be shaded? __3__

Let's Talk About It
Solve the problems below as a group.

8 Write the equivalent fractions from problems 2 and 3. _____

Multiply both the numerator and denominator of $\frac{1}{4}$ by the same number to get $\frac{2}{8}$.

What number did you use? Why does this make sense?

$\boxed{2}$

What happens if you divide both the numerator and the denominator in $\frac{2}{8}$ by 2?

Go Back to $1/4 \Rightarrow$

9 To find an equivalent fraction to $\frac{6}{8}$, Beth divided by 2 to get 4 in the denominator. What should Beth do to find the numerator? What are the equivalent fractions?
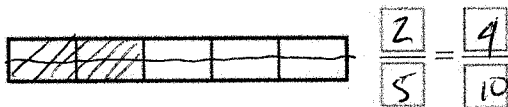
$\frac{6}{8}$ By $2 \Rightarrow 3/4 = 6/8$

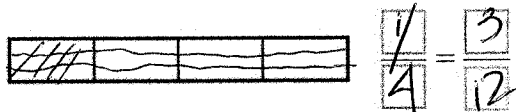**10** Fill in the missing numbers to find an equivalent fraction to $\frac{5}{6}$.

$$\frac{5 \times 2}{6 \times \boxed{2}} = \frac{\boxed{10}}{\boxed{12}}$$

▶ Try It Another Way Work with your group to model equivalent fractions.

11 Shade the model to show $\frac{2}{5}$. Then show 10 equal parts and write the equivalent fractions.

$$\frac{\boxed{2}}{\boxed{5}} = \frac{\boxed{4}}{\boxed{10}}$$

12 Shade the model to show $\frac{1}{4}$. Then show 12 equal parts and write the equivalent fractions.

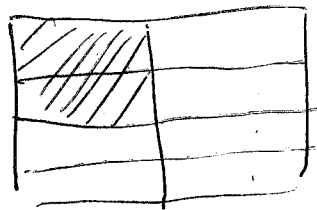$$\frac{\boxed{1}}{\boxed{4}} = \frac{\boxed{3}}{\boxed{12}}$$

Connect **Ideas about Equivalent Fractions**

Talk through these problems as a class, then write your answers below.

13 Compare Use different methods to find two fractions that are equivalent to $\frac{3}{3}$.

14 Illustrate Explain why you can multiply both the numerator and denominator by the same number to make an equivalent fraction. Draw a model to show an example.

$\frac{1}{4} \Rightarrow \frac{2}{8}$ { – SAME AMOUNT of ORIG. RECT IS SHADED IN ,–

15 Choose Think about the cooking problem below.

Fia needs $\frac{3}{4}$ of a cup of brown sugar. She only has a $\frac{1}{3}$-cup measuring cup and a $\frac{1}{8}$-cup measuring cup. Which should she use and why?
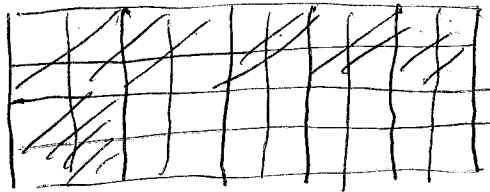
$\frac{1}{8}$ bc easy to convert $3/4 = 6/8$!

Apply Ideas about Equivalent Fractions

16 Put It Together Use what you have learned to complete this task.

Part A Draw a model to show the fraction $\frac{6}{10}$ and two equivalent fractions.

$$\frac{6}{10} = \frac{12}{20} = \frac{24}{40}$$

Part B How can you use multiplication and division to check your equivalent fractions in Part A? Why does this work?

Multiply a DIME TOP # & BOTTOM # by
SAME #!

What is this lesson about?: Today you will learn more about fractions.

Warm Up and Review Problems:

In the early 1900s, many African Americans migrated from the south to the north, midwest and even the west coast. Most did this to escape the difficult economic challenges of sharecropping and the dangerous and unsafe living conditions imposed under Jim Crow laws and its pervasive violence. The trec to Chicago, Philadelphia or New York was risky, but offered hope of a more real 'freedom."

Consider this example:
Ronald, his wife and two children, Robert and Joe, worked as sharecroppers until the early 1900s. In 1910, Joe, now 30 years old, left the family farm to head to Chicago. He wanted to move away from the only life he had known, living and working on a small farm in Orangeburg, SC. With some modest savings and the support of his family he boarded a train for Chicago. Upon arrival, he was met by an aunt, who helped him find a room in a boarding house and a job working in a meat packing plant. Use the information below to answer some questions about Joe.

Joe rented a room in a boarding house. He paid a little extra to get a hot breakfast and dinner each day, and to get a packed lunch he could take to work. Use the chart below to answer some questions about Joe's first few months in Chicago.

Expenses-
Monthly':	$90/month ($3/night)
Monthly food from house mom:	$60/month ($2/day)
Bus fare to/from work	$10/month ($0.50/day round trip on bus)
Weekend 'fun and food'	$40/month ($10/weekend--movie, dinner, date…)

Wages/Earnings-
Hours worked per week:	40
Wages per hour	$1.50/hour
# of days/month worked	20 days per month-

At the end of a month, how much money did Joe spend? *$200/Month*

How much did he earn each month? *$60 per week = $240/Month*

So, after he paid all of his bills, how much money did Joe have left over at the end of the month? *$40*

Joe tried to send his mom and dad $10 each month. Would he have enough money to do that? *Yes, He Cuid send Home $ & still Have $30 Left over, total*

9

He also wanted to save $20 each month so that he could save up money to move into his own apartment in a couple of years. He needed to save up about $300 to put down a security deposit and get some furniture, etc. How many months would it take him to save up to get his own apartment?

$20 \times ? = \$300 \Rightarrow 15$ months

What percent (remember from last lessons) of his total monthly wages went to pay for his room and food?

Room + Food = $\$150$ & Total Wages = $\$240$

Joe could work one Saturday per month for 8 hours and earn overtime. He would get an extra $0.50 per hour for this. How much would he earn for working an overtime Saturday?

$8 \times \$2.00/hr = \$16$ Each Saturday

Activities/Fraction Problems: Complete the following fractions worksheets
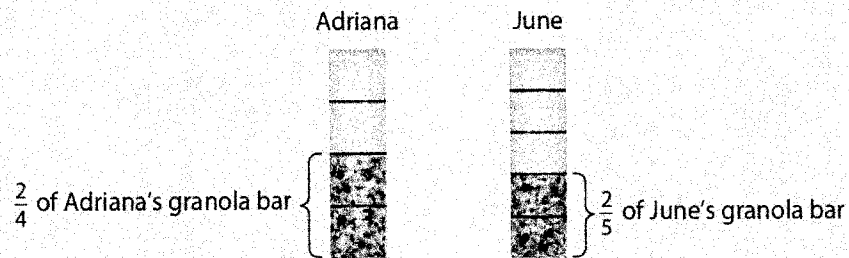
$150/240$

$15/24$

$5/8$

62.5%

◉ Use What You Know

In the past, you learned to compare fractions using models. Take a look at this problem.

Adriana and June have granola bars that are the same size. Adriana ate $\frac{2}{4}$ of her granola bar. June ate $\frac{2}{5}$ of her granola bar. Which girl ate more of her granola bar?

Adriana   June

$\frac{2}{4}$ of Adriana's granola bar $\frac{2}{5}$ of June's granola bar

a. How many equal pieces of granola bar did Adriana eat? ___ 2/4 ___

b. How many equal pieces of granola bar did June eat? ___ 2/5 ___

c. Since both girls ate the same number of pieces, what can you look at to find out who ate more granola bar? ___ Denominator ___

d. What does the size of the denominator tell you about the size of the pieces of granola bar? ___ ↑ Denominator = ↓ Each Piece ___

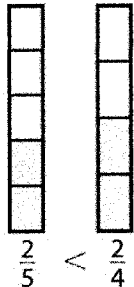**e.** Who ate more? Explain why. ___ Adriana = 2/4 ˃ 1/2 ⟹ Just A Bit More ___

11

Deciding who ate more of her granola bar means comparing the fractions $\frac{2}{4}$ and $\frac{2}{5}$. To compare fractions, you must use the same-size whole.

- The granola bars were the same size, so you can compare the fractions to know who ate more. These area models compare $\frac{2}{4}$ and $\frac{2}{5}$.
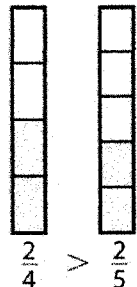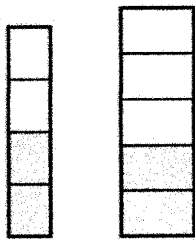
$$\frac{2}{4} > \frac{2}{5}$$

$\frac{2}{4}$ is greater than $\frac{2}{5}$.

$$\frac{2}{5} < \frac{2}{4}$$

$\frac{2}{5}$ is less than $\frac{2}{4}$.

- If the granola bars were not the same size, you could not compare the fractions to know who ate more.

$\frac{1}{5}$ of the larger granola bar looks to be larger than $\frac{1}{4}$ of the smaller granola bar.

- You can use equivalent fractions to compare fractions. Rewrite one, or both, of the fractions so they have the same denominator, or a **common denominator**.

$$\frac{2 \times 4}{5 \times 4} = \frac{8}{20} \text{ and } \frac{2 \times 5}{4 \times 5} = \frac{10}{20}$$

$$\frac{8}{20} < \frac{10}{20}, \text{ so } \frac{2}{5} < \frac{2}{4}.$$

▶ Reflect

1 Explain how you can tell which fraction is greater, $\frac{2}{5}$ or $\frac{3}{10}$.

CONVERT TO SAME DENOMINATOR.

$$2/5 = 4/10 \Longrightarrow 4/10 > 3/10$$

Learn About ▶ Common Numerators and Denominators

Read the problem below. Then explore different ways to understand it.

A grasshopper weighs about $\frac{2}{100}$ of an ounce. A beetle weighs $\frac{8}{10}$ of an ounce. Which weighs more?

▶ **Picture It** **You can use models to help compare fractions.**

The model shows the fractions of an ounce that the grasshopper and beetle weigh.

Grasshopper   Beetle
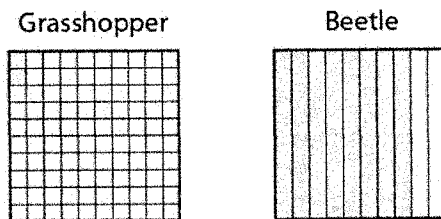
▶ **Model It** **You can use a common denominator to help you solve the problem.**

When you compare two fractions, it helps if they have a common denominator. Fractions with the same denominator are divided into the same number of equal parts. When two fractions have the same denominator, you can compare the numerators.

Compare $\frac{2}{100}$ and $\frac{8}{10}$.

The fractions do not have a common denominator. Find a fraction equivalent to $\frac{8}{10}$ that has a denominator of 100.

$$\frac{8}{10} \times \frac{10}{10} = \frac{80}{100}$$

Now, compare the numerators of $\frac{2}{100}$ and $\frac{80}{100}$.

$80 > 2$

So, $\frac{80}{100} > \frac{2}{100}$ and $\frac{8}{10} > \frac{2}{100}$.
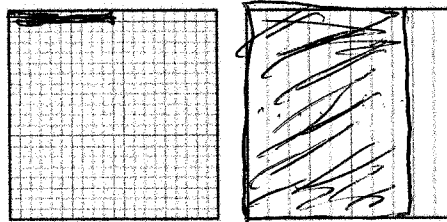
The beetle weighs more than the grasshopper.

13

► **Connect It** Now you will solve the problem from the previous page by finding a common numerator.

2 What is an equivalent fraction for $\frac{2}{100}$ that has a numerator of 8? _$\frac{8}{400}$_

3 One model is divided into ⟨400⟩ equal parts and the other is divided into 10 equal parts. Which has smaller parts?

IN 400 PARTS!

4 Shade 8 parts of each model.

#2

5 Which model has a greater area shaded? _____

6 Which fraction is greater, $\frac{8}{400}$ or ⟨$\frac{8}{10}$?⟩ _____

7 Look at the denominators of $\frac{8}{400}$ and $\frac{8}{10}$. When two fractions have the same numerator and different denominators, how do you know which one is greater? Explain.

FRACTION w/ SMALLER DENOM!
IS BIGGER

► **Try It** Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

8 Mel's tomato plant is $\frac{8}{12}$ of a foot tall. Her pepper plant is ⟨$\frac{3}{4}$⟩ of a foot tall. Compare the heights of the plants using <, >, or =.

$\frac{8}{12}$ VS $\frac{9}{12}$

9 Compare the fractions $\frac{4}{6}$ and $\frac{2}{5}$ using <, >, or =.

$\frac{4}{6}$ $\frac{2}{5}$
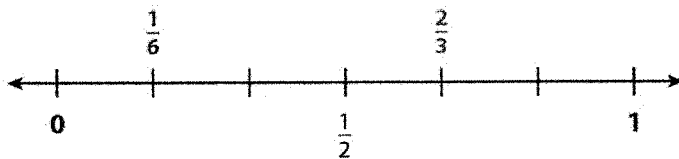
$\frac{20}{30} > \frac{12}{30}$

Learn About ▶ Using a Benchmark to Compare Fractions

Read the problem below. Then explore different ways to use benchmarks to compare fractions.

Jasmine's swimming lesson lasts for $\frac{2}{3}$ of an hour. It takes her $\frac{1}{6}$ of an hour to do her homework. Will Jasmine spend more time on her homework or at her swimming lesson?

▶ **Model It** You can use a number line to help you compare fractions.

The number line shows where the fractions $\frac{2}{3}$ and $\frac{1}{6}$ are compared to 0 and 1.

$$
\begin{array}{ccccccc}
& \frac{1}{6} & & & \frac{2}{3} & & \\
\end{array}
$$

```
        1/6              2/3
 ←──┼────┼────┼────┼────┼────┼────┼──→
   0              1/2              1
```
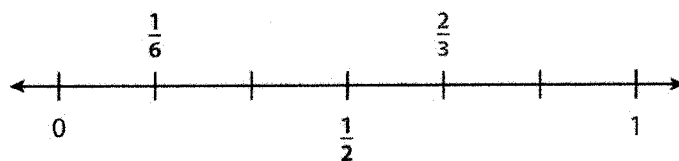
The number line shows that $\frac{1}{6}$ is closer to 0 than $\frac{2}{3}$ is, and that $\frac{2}{3}$ is closer to 1 than $\frac{1}{6}$ is. This means that $\frac{1}{6} < \frac{2}{3}$ and $\frac{2}{3} > \frac{1}{6}$.

▶ **Solve It** You can use a benchmark fraction to solve the problem.

Another way to compare fractions is by using a **benchmark fraction**.
Use $\frac{1}{2}$ as a benchmark to compare $\frac{1}{6}$ and $\frac{2}{3}$.

```
        1/6              2/3
 ←──┼────┼────┼────┼────┼────┼────┼──→
   0              1/2              1
```

The number line shows that $\frac{1}{6}$ is less than $\frac{1}{2}$ and $\frac{2}{3}$ is greater than $\frac{1}{2}$.
So, $\frac{1}{6} < \frac{2}{3}$ and $\frac{2}{3} > \frac{1}{6}$.

Jasmine will spend more time at her swimming lesson than on homework.

▶ **Connect It** Now you will solve a similar problem using 1 as a benchmark. Think about the two fractions $\frac{11}{10}$ and $\frac{7}{8}$.

10 Which fraction, $\frac{11}{10}$ or $\frac{7}{8}$, is greater than 1? ___ $\frac{11}{10}$

11 Which fraction, $\frac{11}{10}$ or $\frac{7}{8}$, is less than 1? ___ $\frac{7}{8}$

12 Which fraction, $\frac{11}{10}$ or $\frac{7}{8}$, is greater? Explain why.

$\frac{11}{10}$ B|C is 4 than 1 whoe

13 Write <, >, or = to show the comparison. $\frac{11}{10}$ $\bigcirc$ $\frac{7}{8}$

14 Explain how you can use benchmarks to compare fractions.

— Place on # Line & compare —

▶ **Try It** Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

15 Use <, >, or = to complete the comparison. Explain how you found your answer. $\frac{5}{10}$ $\bigcirc$ $\frac{3}{4}$

$\frac{10}{20}$ < $\frac{15}{20}$

16 Nathan walked $\frac{10}{10}$ of a mile. Sarah walked $\frac{19}{20}$ of a mile. Who walked a greater distance? Explain.

$\frac{10}{10}$ > $\frac{19}{20}$
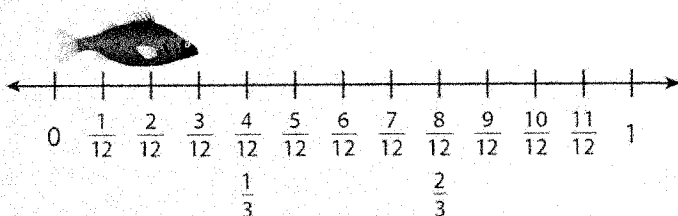
$\frac{20}{20}$ >

Practice **Comparing Fractions**

Study the example below. Then solve problems 17–19.

Example

Becker catches a fish that is $\frac{3}{12}$ of a yard long. To keep the fish, it has to be longer than $\frac{1}{3}$ of a yard. Can Becker keep his fish?

Look at how you could show your work using a number line.

Solution Since $\frac{3}{12}$ is less than $\frac{1}{3}$, Becker can't keep his fish.
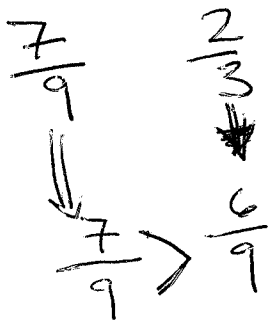
> It is important that both measurements use the same unit!

Pair/Share
How else could you solve this problem?

17 Myron and Jane are working on the same set of homework problems. Myron has finished $\frac{7}{9}$ of the problems and Jane has finished $\frac{2}{3}$ of the problems. Who has finished more of their homework problems?

Show your work.

$$\frac{7}{9} \qquad \frac{2}{3}$$
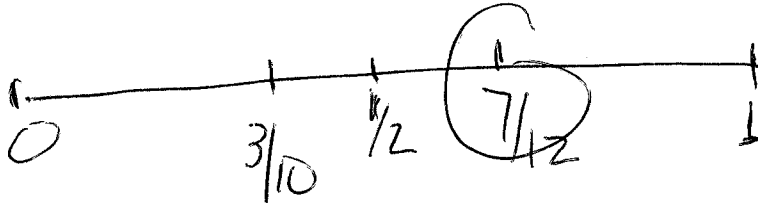
$$\frac{7}{9} > \frac{6}{9}$$

> Which strategy for comparing do you think works best with these fractions?

Pair/Share
How did you and your partner choose what strategy to use to solve the problem?

Solution _____

17

18 Compare the fractions $\frac{3}{10}$ and $\frac{7}{12}$ using the benchmark fraction $\frac{1}{2}$.
Show your work.

0   3/10   1/2   7/12   1

$7/12 > 3/10$

Solution _____

19 Janelle walked $\frac{3}{6}$ of a mile. Pedro walked $\frac{6}{10}$ of a mile. Which statement shows how to find the greater fraction? Circle the letter of the correct answer.

A $\frac{3}{6} = \frac{6}{12}$ and $\frac{6}{12} < \frac{6}{10}$

B $\frac{3}{6} = \frac{6}{12}$ and $\frac{6}{12} > \frac{6}{10}$ No Correct

C $\frac{6}{10} = \frac{3}{5}$ and $\frac{3}{5} < \frac{3}{6}$

D $\frac{3}{6} < \frac{1}{2}$ and $\frac{6}{10} > \frac{1}{2}$

Tina chose **B** as the correct answer. How did she get that answer?

w/ Same Num, Frac w/ Samller Denom is Bigger

Practice **Comparing Fractions**

Solve the problems.

1 Grant needs $\frac{2}{3}$ cup of raisins and $\frac{3}{4}$ cup of almonds to make trail mix. Which statement can be used to find out if there are more raisins or almonds in the mix?

A $\frac{2}{3} = \frac{8}{12}$ and $\frac{3}{4} = \frac{9}{12}$ ✓

B $\frac{2}{3} = \frac{4}{6}$ and $\frac{3}{4} = \frac{4}{5}$

C $\frac{2}{3} = \frac{6}{9}$ and $\frac{3}{4} = \frac{6}{12}$

D $\frac{2}{3} = \frac{6}{9}$ and $\frac{3}{4} = \frac{6}{7}$

2 Tell whether each comparison is *True* or *False*.

a. $\frac{2}{5} < \frac{4}{10}$ ☐ True ☑ False

b. $\frac{7}{10} > \frac{7}{8}$ ☐ True ☑ False

c. $\frac{1}{2} > \frac{3}{8}$ ☑ True ☐ False

d. $\frac{2}{4} = \frac{4}{6}$ ☐ True ☑ False

e. $\frac{30}{100} = \frac{3}{10}$ ☑ True ☐ False

3 Fill in the circle with one of the symbols below to correctly compare $\frac{5}{10}$ and $\frac{5}{8}$.

$<$ $=$ $>$

$\frac{5}{10}$ $\bigcirc\!\!\!<$ $\frac{5}{8}$

19

4 Sam's music teacher told him to practice his trombone for $\frac{5}{10}$ of an hour. He spent $\frac{2}{6}$ of an hour practicing. Did he practice long enough?

Show your work.

No

Answer Sam *DID Not* practice long enough.

5 Olivia and Eleanor each made the same amount of lemonade to sell at a lemonade stand. Olivia poured all of her lemonade into 10 equal-size glasses. Eleanor poured all of her lemonade into 5 equal-size glasses. Olivia sold 7 glasses of lemonade and Eleanor sold 2 glasses. Which girl sold a greater fraction of her lemonade? Compare the fractions using a symbol.
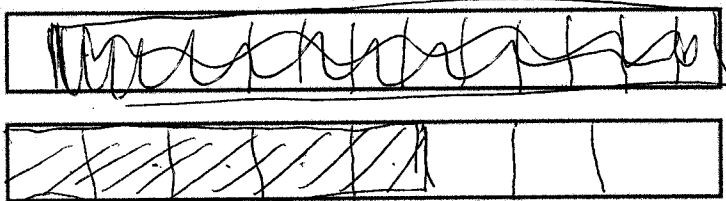
Show your work.

$7/10 > 2/5$

Answer *Olivia* sold a greater fraction of her lemonade.

6 Rachel and Sierra are selling boxes of fruit as a fundraiser. Rachel has sold $\frac{9}{10}$ of her boxes of fruit and Sierra has sold $\frac{5}{8}$ of her boxes. Which girl has sold a greater fraction of her boxes of fruit? Draw a model to show your answer.

Show your work.

$9/10$

OOPS

Answer *RACHEL* has sold a greater fraction of her boxes of fruit.

✓ Self Check **Go back and see what you can check off on the Self Check on page 143.**

What is this lesson about?: Today you will be exploring addition and subtraction of fractions.

Warm Up and Review Problems:

Destiny was 17 when she was arrested for distributing marijuana and other drugs. She was adjudicated delinquent as a juvenile and spent 8 months in a youth facility Washington, DC. While detained she really got into school and started to catch up. When she was released she went to summer school and then went back to high school full-time, taking extra classes to catch up with her credits. In June of 2018, she graduated. And in August of 2018 she headed off to college. Asked about her road to college she said that she never thought she would experience the sort of Freedom she felt when she got in a car with her dad to go to college.

Consider:
Researchers estimate that only 15% of the students who spend time in a juvenile facility will graduate from high school.
- If 3,000 teens spend time in a youth facility, how many would be projected to graduate high school?

$$3000 \times .15 = 450 \text{ out of } 3,000$$

For each youth who does graduate, approximately 10% are projected to go to college and graduate.
- Of those who graduate (from that 3,000), how many are predicted to graduate from college?

$$450 \times .10 = 45 \text{ Graduate from College}$$

So far, Destiny is beating all of these odds!!!
How is she making it happen? We asked her and her are some of her responses-
- Q: How many hours a day do you spend studying at college?
- A: I have classes for about 3 hours each day, but I also work part-time to help me afford school expenses. So, I get up at 530am and study from 6am-9am. Then I eat, go to classes, have some fun with friends, go to the gym....I work every day in the library from 4pm-7pm. Then I have dinner and chill a bit. I go back to the library from 8pm to 11pm. I usually meet a tutor there to help me with my Calculus class for 90 minutes since that is my hardest class. Then I head back to the dorm....

If you count the hours that Destiny is in class and the hours that she is in the library, how many hours a day is Destiny studying?

Study 6:00AM — 9:00AM = 3
8:00PM — 11:00PM = 3 ⟩ 6 hr + Classes

In addition to the hours mentioned above, Destiny also works from 11am-2pm on Saturdays at the library. How many hours per week does she work?

$$4:00pm - 7:00pm \times 5 = 15 \text{ hrs} + 3 \text{ hrs on Sat} = 18 \text{ hrs total}$$

If Destiny works with her tutor on Calculus for 90 minutes on Mon-Friday and on Sunday, how many hours per week does she study with her tutor?

$$90 \times 5 = 450 \text{ minutes} + 90 = \text{ 540 minutes} \rightarrow 9 \text{ hours}$$

21

About how many hours per day does Destiny sleep?   11PM → 530AM = 6.5hrs

Destiny had a summer job working for a local nonprofit as a social media and communications intern that helps teenagers prepare for college life. She loved it. She said it made her feel free, like all of her work was worth it. She worked **12 weeks** over the summer. She earned $15 per hour, working 40 hours per week. About how much money did she earn each week? How much did she earn over the summer?

$$\begin{array}{r} 40 \\ \times 15 \\ \hline 200 \\ 40 \\ \hline 600 \end{array} / \text{wk}$$

$$\begin{array}{r} \$600 \\ \times 12 \text{ Weeks} \\ \hline \boxed{\$7,200} \end{array}$$

Activities/Fraction Problems: Complete the following fractions worksheets.

Understand Fraction Addition and Subtraction
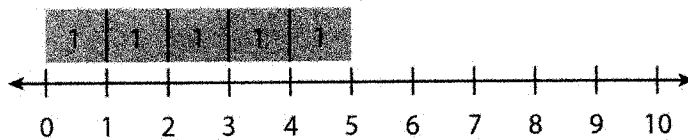
Think It Through

What's really going on when we add numbers?

Adding means joining or putting things together.

Think about how you could explain adding 2 + 3 to a first grader. You could start at 2, count on 3 more, and see where you end up: 2 . . . 3 . . . 4 . . . 5.
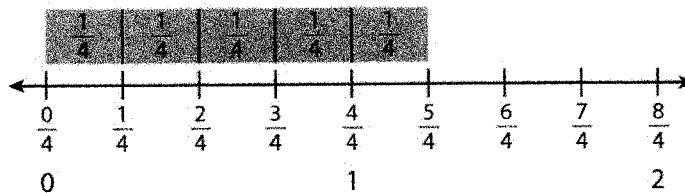
Or, you could put a segment with a length of 2 and a segment with a length of 3 next to each other on a number line to show **2 + 3**.

When you add 2 + 3, you are putting ones together.

Think Adding fractions means putting together parts of the same whole.

You can put a segment with a length of $\frac{2}{4}$ and a segment with a length of $\frac{3}{4}$ next to each other to show $\frac{2}{4} + \frac{3}{4}$.
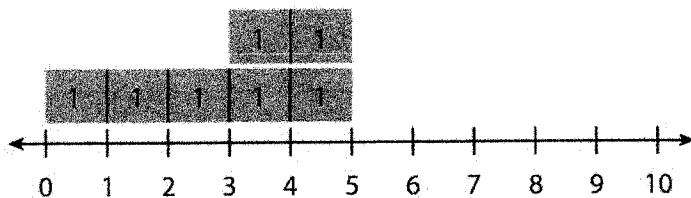

When you add $\frac{2}{4} + \frac{3}{4}$, you are putting one-fourths together.

Underline the sentence that explains what adding fractions means.

23

## Think Subtracting means separating or taking away.

On a number line, you can start with a segment of length 5 and take away a segment of length 2 to show **5 − 2**.

> Look at the whole numbers. Now look at the numerators of the fractions. I think I see a connection.

When you subtract 5 − 2, you are taking away ones.

You can show subtracting fractions on a number line. Start with a segment of length $\frac{5}{4}$ and take away a segment of length $\frac{2}{4}$ to show $\frac{5}{4} - \frac{2}{4}$.
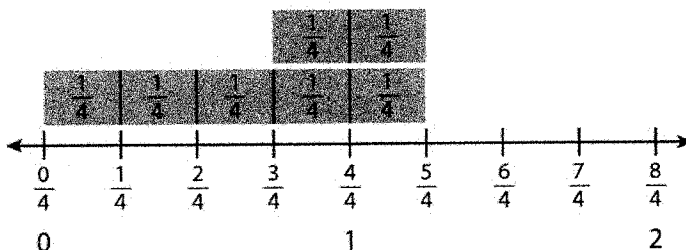
When you subtract $\frac{5}{4} - \frac{2}{4}$, you are taking away one-fourths.

Now you'll have a chance to think more about how adding or subtracting fractions is like adding or subtracting whole numbers. You may find that using number lines or area models can help you explain your thinking.

▶ Reflect

1 Use your own words to describe what you just learned about adding and subtracting fractions.

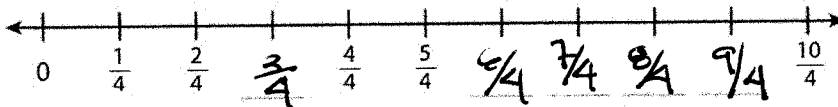_IF DENOMINATERS ARE THE SAME → ADD OR SUBTRACT NUMERATORS!_

Think About ▶ Adding and Subtracting Fractions

Let's Explore the Idea Counting on and using a number line are two ways to think about adding fractions.
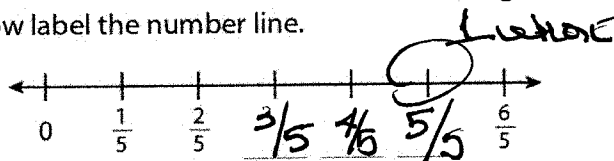
2 Count by fourths to fill in the blanks: $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{5}{4}$, $\frac{6}{4}$, $\frac{7}{4}$, $\frac{8}{4}$, $\frac{9}{4}$

Now label the number line.

$$0 \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4} \quad \frac{5}{4} \quad \frac{6}{4} \quad \frac{7}{4} \quad \frac{8}{4} \quad \frac{9}{4} \quad \frac{10}{4}$$

3 Count by fifths to fill in the blanks: $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{5}{5}$

Now label the number line.

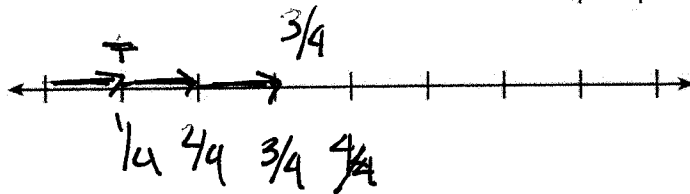$$0 \quad \frac{1}{5} \quad \frac{2}{5} \quad \frac{3}{5} \quad \frac{4}{5} \quad \frac{5}{5} \quad \frac{6}{5}$$

Use the number lines above to answer problems 4 and 5.

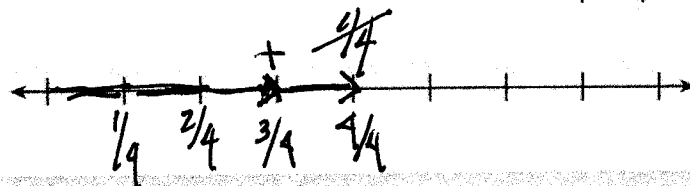**4** What is $\frac{1}{4}$ more than $\frac{6}{4}$? _____

5 What is $\frac{1}{5}$ more than $\frac{3}{5}$? _____

Now try these two problems.

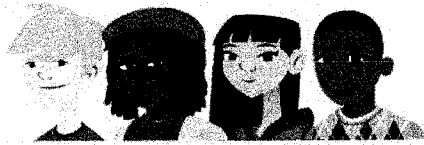**6** Label the number line below and use it to show $\frac{2}{4} + \frac{1}{4}$.

$$\frac{3}{4}$$

$$\frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4}$$

7 Label the number line below and use it to show $\frac{3}{4} + \frac{1}{4}$.

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

$$\frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4}$$

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Let's Talk About It
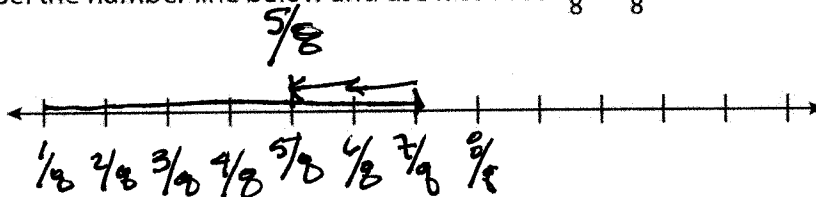
Solve the problems below as a group.

8 Look at your answers to problems 2 and 3. How is counting with fractions the same as counting with whole numbers?

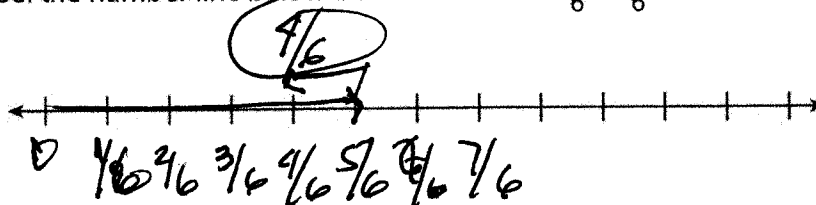_ADD OR SUBTRACT THE TOP # →_

ADDING OR SUBTRACTING = SIZE "CHUNKS"

How is it different?

You end up w ANSWERS in

Fraction Form —

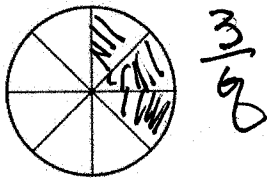**9** Label the number line below and use it to show $\frac{7}{8} - \frac{2}{8}$.

$\frac{5}{8}$

$\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$ $\frac{7}{8}$ $\frac{8}{8}$

10 Label the number line below and use it to show $\frac{5}{6} - \frac{1}{6}$.

$\frac{4}{6}$

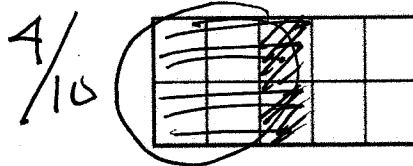0 $\frac{1}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{6}{6}$ $\frac{7}{6}$

▶ Try It Another Way Work with your group to use the area models to show adding or subtracting fractions.

11 Show $\frac{1}{8} + \frac{2}{8}$.

$\frac{3}{8}$

12 Show $\frac{6}{10} - \frac{2}{10}$.

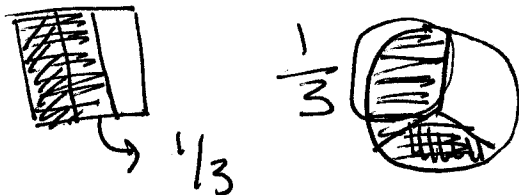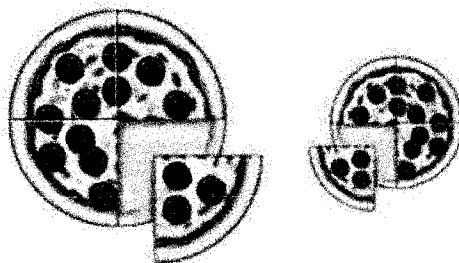$\frac{4}{10}$

Connect ▶ Ideas about Adding and Subtracting Fractions

Talk through these problems as a class, then write your answers below.

13 Compare Draw two different models to show $\frac{2}{3} - \frac{1}{3}$.

$\frac{1}{3}$

14 Explain Rob had a large pizza and a small pizza. He cut each pizza into fourths. He took one fourth from each pizza and used the following problem to show their sum: $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$.
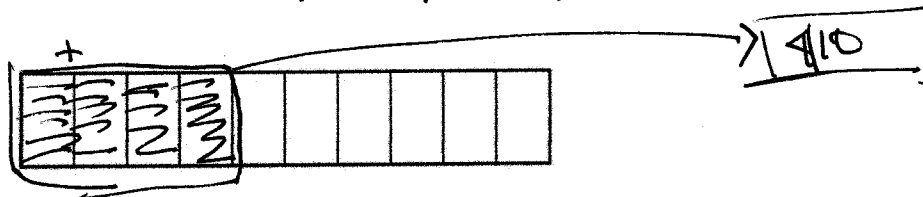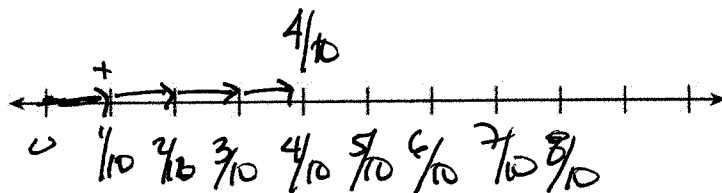What did Rob do wrong?

THE FRACTION NEEDS TO BE BASED OFF OF THE SAME WHOLE —

15 Demonstrate Think about how you would add three whole numbers. You start by adding two of the numbers. Then you add the third number to that sum. You add three fractions the same way.

Use the number line and area model below to show $\frac{1}{10} + \frac{3}{10} + \frac{4}{10}$.

$\frac{4}{10}$

$0 \quad \frac{1}{10} \quad \frac{2}{10} \quad \frac{3}{10} \quad \frac{4}{10} \quad \frac{5}{10} \quad \frac{6}{10} \quad \frac{7}{10} \quad \frac{8}{10}$

$\frac{8}{10}$

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Apply ▶ Ideas about Adding and Subtracting Fractions

**16 Put It Together** Use what you have learned to complete this task.

Jen has $\frac{4}{10}$ of a kilogram of dog food. Luis has $\frac{3}{10}$ of a kilogram of dog food.
A large dog eats $\frac{2}{10}$ of a kilogram in one meal.

Part A Write two different questions about this problem that involve adding or subtracting fractions.

Question 1: How Many Kilograms Total Do Jen & Luis have?

Question 2: IF Luis feeds a Large Dog, How Much $ will he have Left over —

Part B Choose one of your questions to model. Circle the question you chose. Show the addition or subtraction using a number line and an area model.
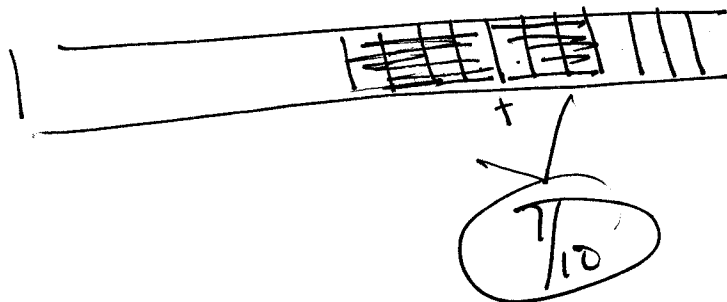
What is this lesson about?: Today you will continue to learn about adding and subtracting fractions.

Warm Up and Review Problems:

Earlonne Woods spent over 20 years locked up in prison in California. A few years ago, while incarcerated at San Quentin State Prison, he started working and learning about sound production. He met a woman named Nigel Poor who was volunteering there as an art teacher. They ended up creating an award winning podcast called Ear Hustle, which is all about life inside of the prison.

In November of 2018, Earlonne was pardoned by the Governor Brown of California, earning his freedom after all those years. He now lives and works in the Oakland area. He loves his freedom, even though making ends meet can be tough for him.

Earlonne was shocked to learn how expensive it is to live in northern California. Even with lots of help and subsidized rent, housing costs are expensive.

Here are some of his monthly bills:

Rent: $1400/month
Utilities: $200/month
Cell phone: $50/month
Transportation $5/day to get to and from work (Mon-Friday)
Groceries, etc $75/week

[handwritten: $2060 $2,050]
[handwritten: 1600 + 400 + 50 = $1750/Month]
[handwritten: 5x5 = $25]
[handwritten: $75 x4]

How much money does Earlonne have to spend each month just to pay his basic bills? *[handwritten: $1,750]*
If Earlonne decides to go out to dinner 1x per week and that dinner costs $15...how much will that cost him in a month? *[handwritten: 15x4 = 60]*

Earlonne earns a pretty good salary now. He is paid $65,000 per year to keep producing the show.

He end up paying about 30% of that in taxes all total. *[handwritten: 65,000 X .3 = $19,500]*

-   How much does he pay in taxes? *[handwritten: 19,500]*
-   How much does he have for 'take-home' pay? *[handwritten: 65,000 - 19,500 = 45,500]*
-   How much is that per month? *[handwritten: 45,500 /12 = $3792]*
-   How much money does Earlonne have each month after he pays his basic bills from above?
-   What are some fun things Earlonne might be able to do with that 'extra' money? *[handwritten: APPROX = $2,000]*
-   What are some things you think he might want to be saving money for? *[handwritten: CAR, VACATION]*

When asked what he likes best about being free in an interview, Earlonne said: "It's impossible to narrow it to one thing. My apartment, learning how to use a cell phone, being able to hug my nephew and niece, going out on a date, sitting down at a restaurant...I'm working hard, but living real well..."

[handwritten: 3792 - 2050 = $1,747]

Activities/Fraction Problems: Complete the following fractions worksheets.
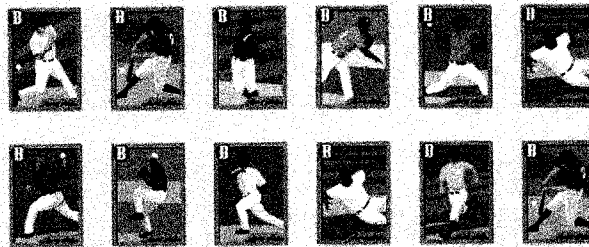
Add and Subtract Fractions

🔾 Use What You Know

In Lesson 15, you learned that adding fractions is a lot like adding whole numbers. Take a look at this problem.

Lynn, Paco, and Todd split a pack of 12 baseball cards. Lynn gets 4 cards, Paco gets 3 cards, and Todd gets the rest of the cards. What fraction of the pack does Todd get?

$5/12$

a. How many cards do Lynn and Paco get altogether? _____ 7

b. How many cards does Todd get? _____ 5

c. There are 12 cards in the pack. What fraction represents the

whole pack of cards? _____ $12/12$

d. If Lynn gets 4 cards out of 12, that means she gets $\frac{4}{12}$ of the pack. If Paco gets

3 cards out of 12, what fraction of the pack does he get? _____ $3/12$

e. What fraction of the pack do Lynn and Paco get altogether? _____ $7/12$

f. Explain how you could find the fraction of the pack that Todd gets.

HOW MANY CARD ARE LEFT?

$12/12 - 7/12 = 5/12$

30

>> Find Out More

We often use **fractions** in real life. Fractions can describe something that has several equal parts, as in the baseball card problem. In that problem the "whole" is the pack of cards. Since there are 12 cards in the pack, each card represents $\frac{1}{12}$ of the whole.

$$\frac{4}{12} \qquad \frac{3}{12} \qquad \frac{5}{12}$$
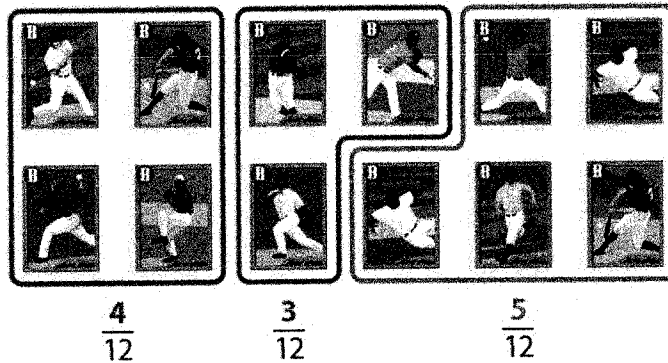
Fractions in real life can also describe the equal parts of a single object, such as a pizza cut into 8 equal slices. The pizza is the "whole," and all the slices of pizza are equal parts of the same whole. Since there are 8 equal-sized slices, each slice is $\frac{1}{8}$ of the pizza. Even if a person takes away one or more slices, the "whole" is still the same 8 slices.
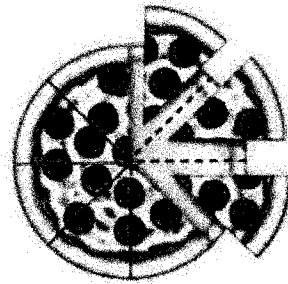
▶ Reflect

1 Give another example of a "whole" object with equal parts that can be described by fractions.

⇒ CAKE CUT INTO = SIZES

⇒ FLOOR CUT INTO TILES

Learn About ▶ Adding Fractions

Read the problem. Then explore different ways to understand adding fractions.

Josie and Margo are painting a fence green. Josie starts at one end and paints $\frac{3}{10}$ of the fence. Margo starts at the other end and paints $\frac{4}{10}$ of it. What fraction of the fence do they paint?
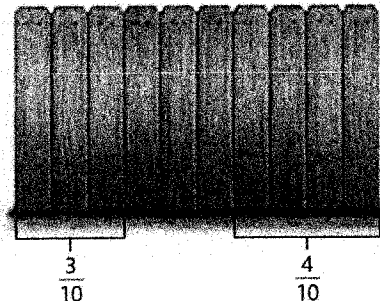
▶ **Picture It** You can use a picture to help understand the problem.

Think what the fence might look like. It has 10 equal-sized parts.
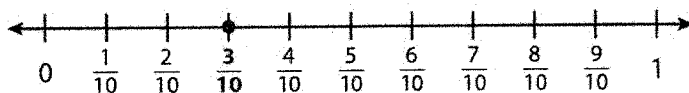
Each part is $\frac{1}{10}$ of the whole. ⌐
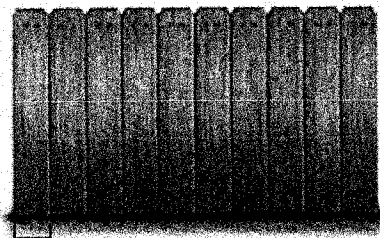
The girls paint 3 tenths and 4 tenths of the fence.
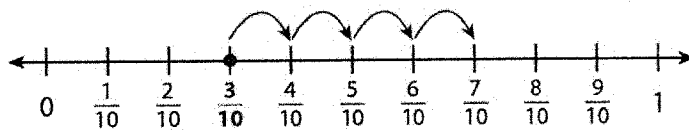
$\frac{3}{10}$ $\frac{4}{10}$

▶ **Model It** You can also use a number line to help understand the problem.

The number line below is divided into tenths, with a point at $\frac{3}{10}$.

```
◄──┼───┼───┼───●───┼───┼───┼───┼───┼───┼──►
   0   1   2   3   4   5   6   7   8   9   1
      10  10  10  10  10  10  10  10  10
```

Start at $\frac{3}{10}$ and count 4 tenths to the right to **add** $\frac{4}{10}$.

```
◄──┼───┼───┼───●───┼───┼───┼───┼───┼───┼──►
   0   1   2   3   4   5   6   7   8   9   1
      10  10  10  10  10  10  10  10  10
```

▶ **Connect It** Now you will solve the problem from the previous page using equations.

2 How do you know that each section of fence is $\frac{1}{10}$ of the total fence?

Cut into = sizes

3 What do the numerators, 3 and 4, tell you? 3 Planks vs 4 Planks

4 How many sections of the fence did Josie and Margo paint altogether? 7

5 Complete the equations to show what fraction of the fence Josie and Margo painted altogether.

Use words: **3 tenths**   +   **4 tenths**   =   7 tenths

Use fractions: $\frac{3}{10}$ + $\frac{4}{10}$ = $\frac{7}{10}$

6 Explain how you add fractions that have the same denominator.

Just ADD Numerators

▶ **Try It** Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

7 Lita and Otis are helping their mom clean the house. Lita cleaned $\frac{1}{3}$ of the rooms. Otis cleaned $\frac{1}{3}$ of the rooms. What fraction of the rooms did Lita and Otis clean altogether? $2/3$

8 Mark's string is $\frac{1}{5}$ of a meter long. Bob's string is $\frac{3}{5}$ of a meter long. How long are the two strings combined? $4/5$ of a meter

Learn About ▸ Subtracting Fractions

**Read the problem. Then explore different ways to understand subtracting fractions.**

Alberto's 1-liter water bottle had $\frac{5}{6}$ of a liter of water in it. He drank $\frac{4}{6}$ of a liter. What fraction of a liter of water is left in the bottle? $\frac{1}{6}$

▶ **Picture It You can use a picture to help understand the problem.**

The following model shows the water bottle divided into 6 equal parts. Five shaded parts show how much water was in the bottle.
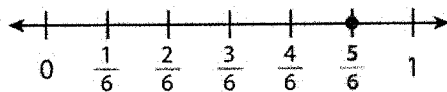
⊐— Each part is $\frac{1}{6}$ of a liter.
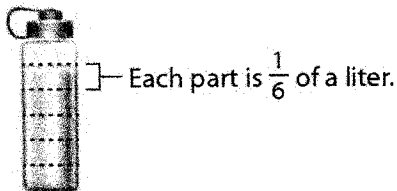
Alberto drank 4 sixths of a liter, so take away 4 shaded parts. The 1 shaded part that is left shows the fraction of a liter that is left.
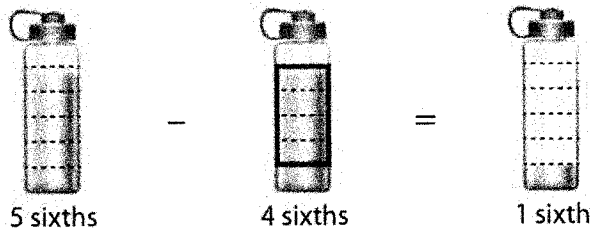
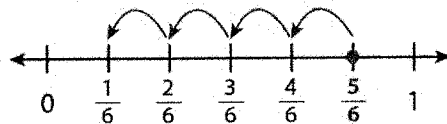|				
5 sixths	—	4 sixths	=	1 sixth

▶ **Model It You can also use a number line to help understand the problem.**

The number line below is divided into sixths, with a point at $\frac{5}{6}$.

$$0 \quad \frac{1}{6} \quad \frac{2}{6} \quad \frac{3}{6} \quad \frac{4}{6} \quad \frac{5}{6} \quad 1$$

Start at $\frac{5}{6}$ and count back 4 sixths to **subtract** $\frac{4}{6}$.

$$0 \quad \frac{1}{6} \quad \frac{2}{6} \quad \frac{3}{6} \quad \frac{4}{6} \quad \frac{5}{6} \quad 1$$

34

▶ Connect It Now you will solve the problem from the previous page using equations.

9 In *Picture It*, why does $\frac{1}{6}$ represent 1 of the equal parts of the bottle?

BOTTLE HOLDS 6 LITERS

10 What do the numerators, 5 and 4, tell you? _How Many_

SIXTY 6th LITERS

11 How many sixths of a liter are left in the bottle after Alberto drank 4 sixths? _1/6_

12 Complete the equations to show what fraction of a liter is left in the bottle.

Use words: **5 sixths** — **4 sixths** = $\boxed{1}$ sixth

Use fractions: $\frac{5}{6}$ — $\frac{4}{6}$ = $\frac{\boxed{1}}{6}$

13 Explain how you subtract fractions with the same denominator.

— Subtract the Numerators

Only —

▶ Try It Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

14 Mrs. Kirk had $\frac{3}{4}$ of a carton of eggs. She used $\frac{2}{4}$ of the carton to make breakfast. What fraction of the carton of eggs does Mrs. Kirk have left? _1/4_

15 Carmen had $\frac{8}{10}$ of the lawn left to mow. She mowed $\frac{5}{10}$ of the lawn. Now what fraction of the lawn is left to mow? _3|10_
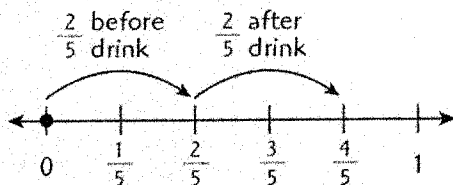
Practice ▶ Adding and Subtracting Fractions

Study the example below. Then solve problems 16–18.

Example

Jessica hiked $\frac{2}{5}$ of a mile on a trail before she stopped to get a drink of water. After her drink, Jessica hiked another $\frac{2}{5}$ of a mile. How far did Jessica hike in all?

Look at how you could show your work using a number line.

$\frac{2}{5}$ before drink $\quad$ $\frac{2}{5}$ after drink

0 $\quad$ $\frac{1}{5}$ $\quad$ $\frac{2}{5}$ $\quad$ $\frac{3}{5}$ $\quad$ $\frac{4}{5}$ $\quad$ 1
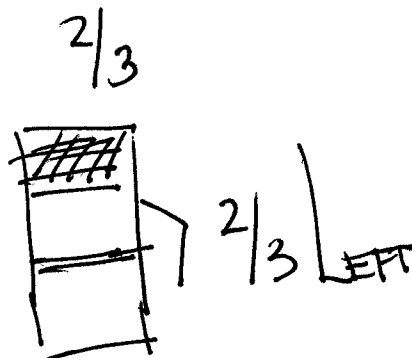
Solution Jessica hiked $\frac{4}{5}$ of a mile.

The student used labels and "jump" arrows to show each part of the hike on a number line. It is just like adding whole numbers!

Pair/Share
How else could you solve this problem?

---

16 Ruth made 1 fruit smoothie. She drank $\frac{1}{3}$ of it. What fraction of the fruit smoothie is left?

Show your work.

$\frac{2}{3}$

$\frac{2}{3}$ LEFT

What fraction represents the whole fruit smoothie?

Pair/Share
How did you and your partner decide what fraction to start with?

Solution _____ $\frac{3}{3} - \frac{1}{3} = \frac{2}{3}$

36

17 Mr. Chang has a bunch of balloons. $\frac{3}{10}$ of the balloons are red. $\frac{2}{10}$ of the balloons are blue. What fraction of the balloons are neither red nor blue?

Show your work.

$$10/10 - 5/10 = 5/10$$

I think that there are at least two different steps to solve this problem.

Solution _____

18 Emily ate $\frac{1}{6}$ of a bag of carrots. Nick ate $\frac{2}{6}$ of the bag of carrots. What fraction of the bag of carrots did Emily and Nick eat altogether? Circle the letter of the correct answer.

A $\frac{1}{6}$

B $\frac{1}{3}$

C $\frac{3}{6}$

D $\frac{3}{12}$

To find the fraction of the bag Emily and Nick ate altogether, should you add or subtract?

Rob chose **D** as the correct answer. How did he get that answer?

Added Denominator ⟹ Not Correct

Practice Adding and Subtracting Fractions

Solve the problems.

1 Liang bought some cloth. He used $\frac{5}{8}$ of a yard for a school project. He has $\frac{2}{8}$ of a yard left. How much cloth did Liang buy?

A $\frac{3}{8}$ of a yard

B $\frac{7}{16}$ of a yard

C $\frac{7}{8}$ of a yard

D $\frac{8}{8}$ of a yard

2 Carmela cut a cake into 12 equal-sized pieces. She ate $\frac{2}{12}$ of the cake, and her brother ate $\frac{3}{12}$ of the cake. What fraction of the cake is left?
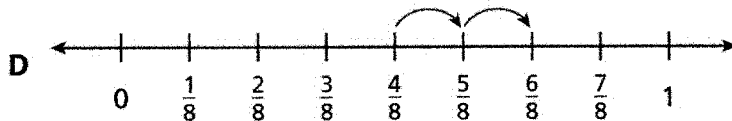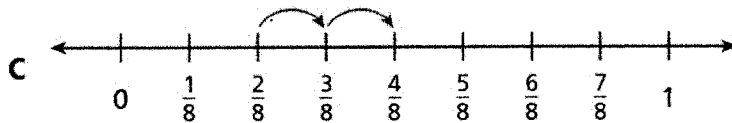
A $\frac{1}{12}$

B $\frac{5}{12}$

C $\frac{7}{12}$

D $\frac{12}{12}$

3 Lee's muffin mix calls for $\frac{2}{3}$ cup of milk and $\frac{1}{3}$ cup of oil. How much more milk than oil does she need for the muffin mix?

$\frac{1}{3}$

38

4 Lucy and Melody are painting a room. They divided the room into 8 equal sections. Lucy painted 2 sections and Melody painted 4 sections. Which model can be used to find the total fraction of the room they painted? Circle the letters of all that apply.

A

(B) ✓

C
$$0 \quad \frac{1}{8} \quad \frac{2}{8} \quad \frac{3}{8} \quad \frac{4}{8} \quad \frac{5}{8} \quad \frac{6}{8} \quad \frac{7}{8} \quad 1$$

D
$$0 \quad \frac{1}{8} \quad \frac{2}{8} \quad \frac{3}{8} \quad \frac{4}{8} \quad \frac{5}{8} \quad \frac{6}{8} \quad \frac{7}{8} \quad 1$$

5 In all, Cole and Max picked $\frac{9}{10}$ of a bucket of blueberries. Cole picked $\frac{3}{10}$ of a bucket of blueberries. What fraction of a bucket of blueberries did Max pick?
Show your work.

$$\frac{9}{10} - \frac{3}{10} = \boxed{\frac{6}{10}}$$

Answer Max picked ___ $\frac{6}{10}$ ___ of a bucket of blueberries.

6 A melon is cut into 8 equal slices. Together, Regan and Juanita will eat $\frac{5}{8}$ of the melon. What is one way the girls could eat that fraction of the melon?
Show your work. Write an equation to represent your answer.

$$\frac{3}{8} + \frac{2}{8} \quad \text{or} \quad \frac{4}{8} + \frac{1}{8}$$

Answer Regan could eat ___ $3/8th$ ___ of the melon, and
Juanita could eat ___ $2/8th$ ___ of the melon.

Equation ___ $2/8 + 3/8 = 5/8$ ___

✓ Self Check Go back and see what you can check off on the Self Check on page 143.

Lesson 16 Add and Subtract Fractions   **175**

What is this lesson about?: Today you will learn about equivalent fractions.

Warm Up and Review Problems:

Malcolm was born in Philadelphia, PA. Over the first 12 years of his life he lived with 6 different families, as a foster care kid. Later, he moved to Florida, near Tampa. He lived there until he turned 17, when he moved to Baltimore, MD, to live with some family friends. From 13 to 17 he was in and out of juvenile facilities in Florida four times.

He is now 22. He attends college part-time, and works 20+ hours per week in a restaurant. He is 1 and ½ years away from earning his degree in criminal justice. He hopes to work with court-involved students once he graduates.

We asked him a few questions, about what Freedom means to him, at age 22 and used his responses to create some math questions about Freedom.

Malcolm says he was always hungry growing up, so whenever he gets a chance to eat a full meal, he does, plus some.

His favorite breakfast is a bowl of frosted flakes, 2 poptarts crumbled up in it and a cup of milk. He estimates that he eats a whole box of cereal in 5 days. If a box of frosted flakes costs $4.50 and a box of 10 pop tarts costs $4.00 and a gallon of milk (16 cups), how much, approximately, does his bowl of cereal cost him?

(handwritten: $1.70 w/o milk) 4.50/5 = .90   +.80 ÷25 = $1.95
(handwritten: 4⁰/₁₀ = 40 x 2 = .80)

For dinner, he loves going to Wendy's. He usually orders two sandwiches/burgers, a large fries and a large drink. He says he stops at Wendy's 2xs per week when he finishes work. He says the burgers he really likes cost $3.50 each, the fries cost $2.75 and he gets his drink for free. How much does he spend on this dinner by eating it 2xs/week?

(handwritten: 3.50 x 2 = 7.00   2.75 / 9.75 x 2 = $19.50)

Malcolm also loves socks....he said that growing up he never had nice socks...So he has lots of pairs of socks, and is always getting them for gifts. He says that he has about 40 pairs of socks. On average, he says they cost about $4.50/pair. What's the value of his socks?

(handwritten: 4.50 x 40 = $180.00)

Malcolm has to pay for his own college. Because he goes to the local community college, classes cost about $1600 per semester. Malcolm qualifies for 60% of his costs to be covered by a Pell Grant. How much is left for him to pay each semester, after his Pell Grant?

(handwritten: 1600 x .6 = 960 (Pell)   1600 - 960 = $640)

We asked Malcolm what Freedom meant to him at age 22. He said that Freedom is being able to go to the community college gym and work out by just showing his college ID, that Freedom is having his own room, and that Freedom will be getting a car in a couple years...

40

Activities/Fraction Problems: Complete the following fractions worksheets.

Lesson 17 👥 Introduction
Find Equivalent Fractions

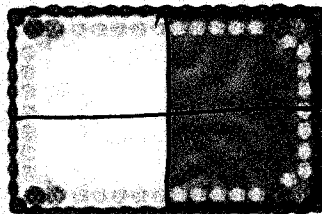### ◯ Use What You Know

In Lesson 16, you learned that equivalent fractions name the same amount of the whole. In this lesson you will learn more about finding equivalent fractions. Take a look at this problem.

Izzy's mom baked a cake. She put chocolate frosting on half of the cake and vanilla frosting on half of the cake.

Then Izzy's mom cut the cake into fourths. What fraction other than $\frac{1}{2}$ names the part of the cake that has chocolate frosting?

a. Look at the picture above. What fraction of the cake has chocolate frosting?

$\frac{1}{2}$

b. How many equal parts should the cake be divided into to show fourths? ⟨4⟩

c. On the picture above, draw lines to divide the cake into fourths. Each fourth should have all chocolate or all vanilla frosting.

d. How many fourths of the cake have chocolate frosting? ___2___

e. Did the amount of cake with chocolate frosting change? Explain how you know that $\frac{1}{2}$ of the cake is the same amount as $\frac{2}{4}$ of the cake.

You can see it in the drawing.

41

▶▶ Find Out More

In the last lesson, you compared two models to understand equivalent fractions. The models were the same size, but they had a different number of equal parts. You named the fraction shown in one model. Then you looked at the other model to find the fraction that named the same amount.

You can also find equivalent fractions by dividing the same model in different ways. The cake Izzy's mom made already showed $\frac{1}{2}$. You may have drawn lines in one of the ways below to show fourths.
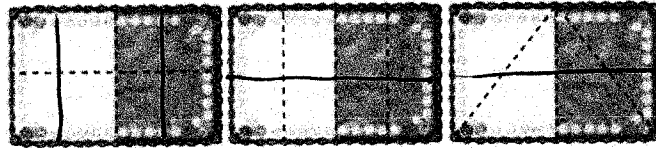
Each of these different ways of making fourths show that $\frac{2}{4}$ of the cake has chocolate frosting.

Remember, you can look at different equal-size parts on a number line to find equivalent fractions. The number line below shows that $\frac{1}{2}$ is equivalent to $\frac{2}{4}$.
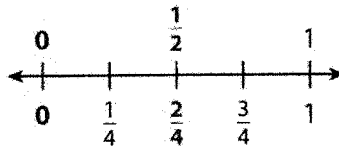
▶ Reflect

1 Izzy's mom now wants to cut the cake into eighths. Explain how to figure out how many eighths of the cake have chocolate frosting.

DRAW ADDITIONAL LINES TO CUT IT INTO 8 = PARTS

► **Connect It** Now you will solve the problem from the previous page using equations.

2 Look at the models in *Picture It*. How do you know that $\frac{2}{8}$ of the first model is shaded? _____

3 How do you know that $\frac{1}{4}$ of the second model is shaded? _____

_____

4 Explain how the models show that the fractions $\frac{2}{8}$ and $\frac{1}{4}$ are equivalent.

_____

5 How does the number line in *Model It* show that the fractions $\frac{2}{8}$ and $\frac{1}{4}$ are

equivalent? _____

_____

6 Complete the sentences to show the fractions of the two oranges name the same amount.

Use words: Two eighths is equal to _____.
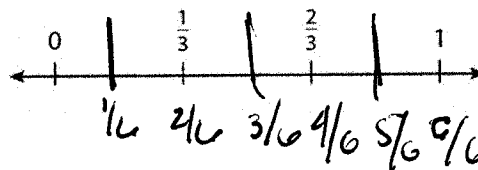
Use fractions: $\frac{2}{8} =$ _____.

7 Describe two different ways to show two fractions are equivalent. _____

_____

_____

► **Try It** Use what you just learned to solve these problems.

8 Draw a model to show $\frac{2}{3} = \frac{4}{6}$.

9 Use the number line below. Find a fraction equivalent to $\frac{1}{3}$. Circle the fraction.

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

$\frac{1}{6}$ $\frac{2}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{6}{6}$
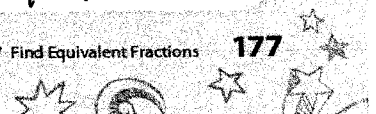
Learn About ▶ Writing a Whole Number as a Fraction

Read the problem below. Then explore different ways to write a whole number as a fraction.

Kacey used 2 boards of the same size to build a birdhouse. He cut each board into fourths. How can you write the number 2 as a fraction to find how many fourths Kacey divided the boards into?

▶ **Picture It** You can use models to help you write a whole number as a fraction.

The fraction strips below show 2 wholes, each divided into fourths.

| $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ |
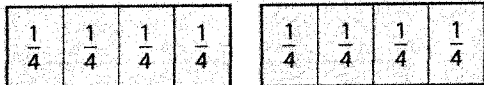
Each part is $\frac{1}{4}$ of a whole. There are eight $\frac{1}{4}$s in all.

▶ **Model It** You can use a number line to help you write a whole number as a fraction.

This number line shows whole numbers on the top and fourths on the bottom.

```
   0            1            2
 ←-+--+--+--+--+--+--+--+--+→
   0   1   2   3   4   5   6   7   8
       4   4   4   4   4   4   4   4
```
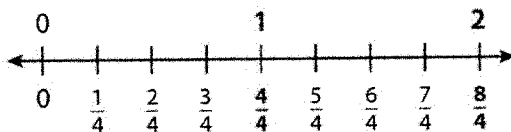
Notice that each whole number has an equivalent fraction with a denominator of 4.

44

▶ **Connect It** Now you will solve the problem from the previous page using equations.

10 Look at the models in *Picture It.* How many equal parts are shown in 1 whole?

Explain how you know. ___(4)___

11 How many equal parts are shown in 2 wholes? Explain how you know.

(8)

12 Complete the sentences to show the fraction that is equivalent to 2.

Use words: Two wholes equals ___8/4___.

Use a fraction: 2 = ___8/4___.

How many fourths did Kacey cut the boards into? ___(8)___ } EACH BOARD INTO 4th

13 Explain how to find a fraction equivalent to a whole number.

TOTAL PARTS n NUMERATR

#f PARTS IN 1 PICE n Denommator 6

▶ **Try It** Use what you just learned to solve these problems.

14 Use the model below. Write a fraction equivalent to 3.
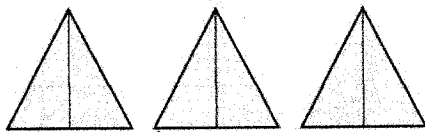
3 = ___6/2___

**15** Draw a model to show $3 = \frac{18}{6}$.

18/6

Learn About ▶ Writing a Whole Number as a Fraction

Read the problem. Then explore different ways to write a whole number as a fraction with a denominator of 1.

Justin picked 4 green peppers from his garden. He did not cut them into pieces. How can you write the number of peppers Justin picked as a fraction?

▶ **Picture It** You can use models to help you write a whole number as a fraction with a denominator of 1.
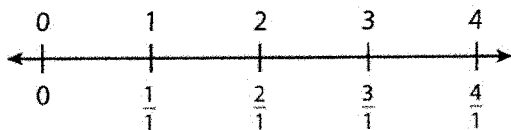
Each circle stands for 1 green pepper.
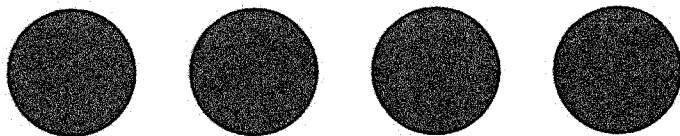
They are not divided into pieces, so each whole has one part.

▶ **Model It** You can use a number line to help you write a whole number as a fraction with a denominator of 1.

This number line shows whole numbers on the top and fractions on the bottom.

Notice that each whole number has an equivalent fraction. The spaces between whole numbers are not divided into parts. Each whole number has one part, so the denominator of each equivalent fraction is 1.

▶ Connect It Now you will solve the problem from the previous page.

16 Look at the models in *Picture It*. Explain how you know each whole has only 1 part.

No Divided or Cut into Parts

17 How many parts do the 4 green peppers make? 4

18 What does the numerator of a fraction show? The # of Objects

19 What does the denominator of a fraction show? The # how many
Pieces any 1 whole is cut into

20 Write a fraction equivalent to 4. Use the fraction below to help you.

$$\frac{\text{number of parts}}{\text{number of equal parts in a whole}}$$

21 Explain how to write a whole number as a fraction with a denominator of 1.

Place the total # over 1

▶ Try It Use what you just learned to solve these problems.

22 Use the model below. Write a fraction equivalent to 6.

$$6 = \frac{6}{1}$$

23 Draw a model to show $5 = \frac{5}{1}$.

OOOOO All The Same Size
Shape

Practice ▶ Finding Equivalent Fractions

Study the example below. Then solve problems 24–26.

Example

Caleb and Hannah bought two melons that are the same size. Caleb cut his melon into fourths. Hannah cut her melon into eighths. Hannah ate $\frac{4}{8}$ of her melon. Caleb ate an equal amount of his melon. What fraction of his melon did Caleb eat?

Look at how you could show your work using a model.
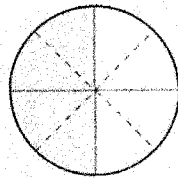
Caleb ate $\frac{2}{4}$ of his melon.

Solution _____

The student used solid lines to show fourths. She used dashed lines to show how to divide fourths to make eighths.

Pair/Share
How could you solve this problem using a number line?

---

24 Matt says $\frac{3}{3}$ is equivalent to 1. Elisa says $\frac{8}{8}$ is equivalent to 1. Who is correct?

Show your work.

BOTH
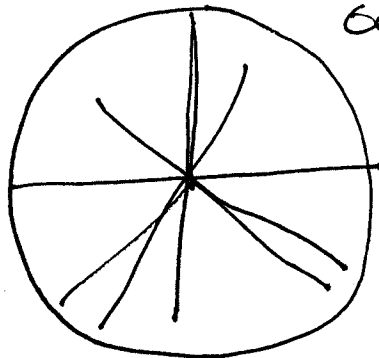
6cps ⟹
1 whole broken in 3 pieces

1 whole broken in 8 pieces
⟩ Both are 1 whole

$3/3 = 1$ $8/8 = 1$

Solution _____

How many thirds are in 1 whole? How many eighths are in 1 whole?

Pair/Share
What is another fraction that is equivalent to 1?

$6/6$

25 Write two fractions that are equivalent to 5.

Show your work.

$$\frac{10}{2 \cancel{5}3} \quad OR \quad \frac{20}{4}$$

Solution DIVIDE 3ly into Numerae by 5

26 Kaia ate $\frac{3}{6}$ of a banana. Zoie ate an equivalent amount. Which fraction shows how much of a banana Zoie ate? Circle the letter of the correct answer.

A $\frac{1}{3}$

B $\frac{2}{3}$

C $\frac{5}{8}$

D $\frac{1}{2}$

Landon chose **A** as the correct answer. How did he get that answer?

Lesson 17 Find Equivalent Fractions   **183**

Practice Finding Equivalent Fractions

Solve the problems.
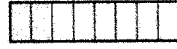
1 Which model below shows a fraction equivalent to $\frac{2}{6}$?
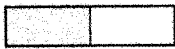
A   B   C   (D)

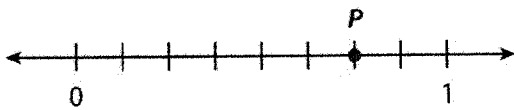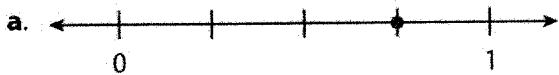**2** Which fraction is equivalent to 3?

A $\frac{3}{1}$

B $\frac{1}{3}$

C $\frac{4}{1}$

D $\frac{6}{3}$

3 Look at point P on the number line.

P

Does the point on the number line show a fraction equivalent to the fraction shown by point P? Choose *Yes* or *No* for each number line.
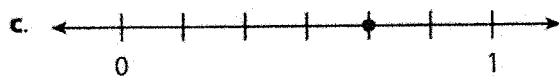
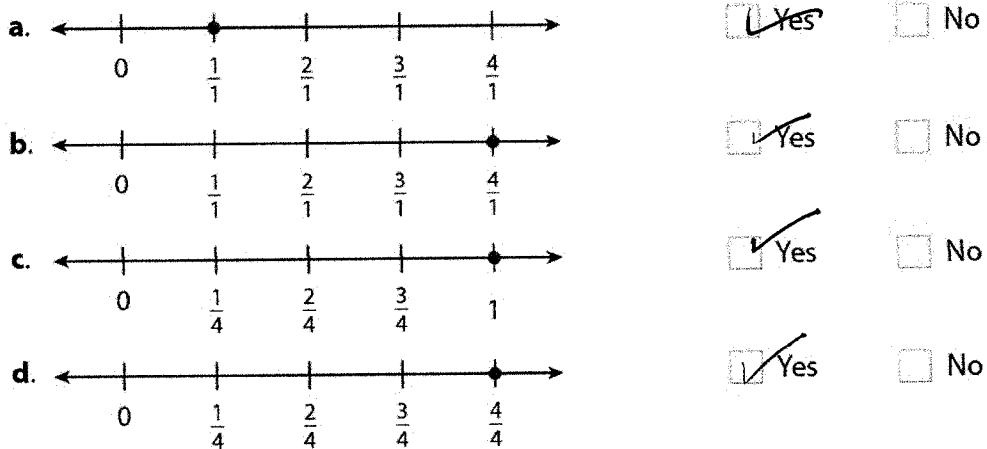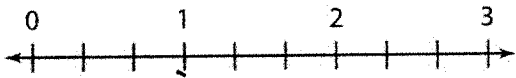a.   ☑ Yes   ☐ No

b.   ☐ Yes   ☑ No

c.   ☐ Yes   ☑ No

50

4 Does the number marked by the point on the number line represent one whole? Choose *Yes* or *No* for each number line.

a.

$$0 \quad \frac{1}{1} \quad \frac{2}{1} \quad \frac{3}{1} \quad \frac{4}{1}$$

☑ Yes   ☐ No

b.

$$0 \quad \frac{1}{1} \quad \frac{2}{1} \quad \frac{3}{1} \quad \frac{4}{1}$$

☑ Yes   ☐ No

c.

$$0 \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad 1$$

☑ Yes   ☐ No

d.

$$0 \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4}$$
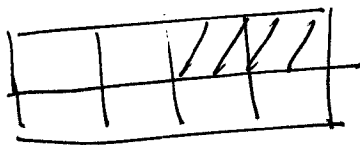
☑ Yes   ☐ No

5 Use the number line below to find a fraction equivalent to 3.

Show your work.

Answer 3 is equivalent to $\frac{9}{3}$.

6 Draw a model to find a fraction equivalent to $\frac{1}{4}$.

Show your work.

Answer $\frac{1}{4}$ is equivalent to $\frac{2}{8}$.

✓ Self Check Go back and see what you can check off on the Self Check on page 155.

Lesson 17 Find Equivalent Fractions **185**

Social studies Answer: Week 8

Day 1	What freedom does religious liberty grant members of a society?
	Religious liberty grants individuals the freedom to practice any religion and to change religions or not practice any religion.
	Why did the Puritans leave England for Massachusetts? What was their goal once they arrived in North America?
	They were being persecuted in England for their religion, so they left to come to America and establish a colony where they could practice their own religion freely.
	What was the infraction Anne Hutchison allegedly committed?
	She spoke against Puritan leaders by saying that what they were teaching was wrong. The ministers were teaching that people could do good works in order ot get to heaven, but Anne stated that this was against the principles of predestination, which says that God controls the future, not our human actions.
	Why do you think the Puritans believe Hutchison's actions were a threat to the colony?
	They were a threat to the colony because she challenges the leaders of the colony. If people started to get on her side of things, the leaders would lose their power.
	Which do you think the Puritans were trying to establish? (circle one)
	Religious liberty <u>OR</u> Freedom to practice their own form of Christianity
	In the case of the Puritans, what was the difference between these two? (discuss your answer with a partner)
	What the Puritans set up in their colony was moreso 'freedom to practice their own form of Christianity.' They did not allow people to practice other forms of religion, so the colony did not really have religious liberty.

Joseph Smith	*He had a vision and message from God that the religions people were*	*The book of Mormon*	*He was pushed out of the settlements he established and forced to*	*The Mormon religion continues and is popular in the U.S. and other*

	practicing were wrong, so he started his own religion		*constantly be on the move. He risked his life and ultimately died*	*aspects of the world*
Mary Baker Eddy	*She was ill most of her life and she studied different healings in the bible, which led her to believe that there was an aspect of science in Christianity*	*Science and Health with Key to Scriptures: you can be healed through medicine of the bible*		*Christian Science is still a popular religion with many followers. She also established news outlets which asre still in business*

Day 2	How did Patrick Henry's proposal for a General Assessment Tax provide funds for churches? *There was a tax imposed on citizens to fund churches, however each individual citizen could choose which church or minister received the money from his taxes.* Why did Jefferson and Madison oppose any government (state) support for religion? *They opposed state support for religion because it would give too much power to the government in controlling people's lives. They feared that if the government could impose a state or national religion, the government may go further and take more power beyond this. They felt a separation of church and state would protect individual freedoms from potential government interference.* Do you think keeping government (state) and religion separate makes society more tolerant or less tolerant? Why? *Answers will vary. Likely to make society more tolerant because people can't point to laws to say that one religion is more important than any other.*

Day 3	**Conestoga Wood Specialties Corp. v. Health and Human Services Department** How did the Supreme Court rule on this case? The supreme court ruled in favor of the employers. In practicing their freedom of religion, the employers did not need to offer birth control as a part of their health indurance benefits. **Masterpiece Cakeshop v. Colorado Civil Rights Commission** How did the Supreme Court rule on this case? The court ruled that the Colorado Civil Rights Commission was biased against the cake shop owner when holding that he discriminated against the gay couple and refusing to bake them a cake for their wedding. In doing so, the court held that the cake shop owner's right to religious freedom allowed him to not bake the cake.
Day 4	**Case:Kennedy v. Bremerton School District** How did the Ninth Circuit Court rule on this case? The court ruled in favor of the school district holding that the school district legally fired the coach for leading the prayers. The coach's firing was not in violation of his first amendment rights to free prayer. **Case: *Trinity Lutheran Church of Columbia v. Comer*** How did the Ninth Circuit Court rule on this case? The court ruled in favor of the chirch, holding that the state of Missouri could not prevent the church from receiving public dollars just because it was religiously affiliated. Receiving state funds for the playground would not violate the consitution's establishment clause.
Day 5	Answers may vary.