General Information

Lesson Parts & Duration

Total Duration: 2 to 2 ½ hours

- Segment 1: Synthesizing Text Features (photographs) *(45 Minutes)*
- Segment 2: Synthesize Text and Key Details, Cause & Effect, & Vocabulary *(30-45 Minutes)*
- Segment 3: Synthesize Text and Key Details, Cause & Effect, Vocabulary, Message of Informational Text and Summary *(45 Minutes)*
- Segment 4: Geometry and Science & Haiku Poem *(30 Minutes)*

Subject(s)

- Informational Text: "The Mendenhall Glacier" & "Thermal Expansion" by Janna Duffy
- Synthesize Text and Key Details, Cause & Effect, Vocabulary, Purpose of Informational Text, and Summary (R.I. 5.1-5.4)

Objective

- Students will take literal interpretation of informational text to evaluation and synthesizing.
- Students will produce a "book" which includes: cause and effect, vocabulary and key details.
- Students will analyze informational text to identify the message or purpose of the text.
- Students will use the "book" they create to write a summary of the informational texts.
- Students will create a visual comparison of glaciers and ice cubes.
- Students will write a Haiku poem that captures the intent of "The Mendenhall Glacier."

Materials

- **Required:** copies of Informational Texts, (pages 13-14), **or** display on a document camera (optional)
- blank pieces of white paper
- lined pieces of paper
- pencil and crayons (markers or colored pencils)
- **Optional:** document camera or similar device to share color photos, text, and drawings with class
- **Optional:** dictionaries
- **Optional:** printable pictures (page 12) (if technology is not available, color copies of the pictures are needed)
- **Optional:** printable "Break Up Your Day" brain/movement break ideas (page 17)

Protocols (on page 16)

- Used throughout lesson - be familiar with each protocol.
- Place Protocols under a document camera (if available) as necessary throughout the lesson.

Throughout these lessons, you will find:

- ***Scripted Text*** indicates things that need to be said directly. Bullets starting with a **"T"** followed by *italicized type* indicate scripted text
- **Clarifiers** within scripted text are in orange
- **Teacher Directions** indicate things you should be doing
- **Side notes** provide helpful hints, ELL strategies, differentiation and information
- **Break Up Your Day** (Brain/Movement Breaks) are in green boxes (at the end)

Remember!

Quality over quantity. All components do not have to be accomplished; lessons may be ended at any time and resumed later.

Instructional Plan: Segment 1: 45 minutes

Subject

- Synthesizing Text Features (photographs)

Objective

- Students will take literal interpretation of informational text to evaluation and synthesizing.

Materials

- blank pieces of white paper
- pencil and crayons (markers or colored pencils)
- **Resources:** document camera or similar device to share color photos, text, and drawings with class
- **Optional:** printable pictures (page 12) (if technology is not available, color copies of the pictures are needed)

Distribute a blank piece of paper to the students.

Introduction

T *Today we are going to evaluate text like a scientist.*
T *We will look for key details, causes and effects while thinking like a scientist.*
T *We are going to fold our piece of paper in half creating a "Book."*
T *Write your name and date in top right corner and number all four pages.* Model this step so students can follow along with your example.

Give time for students to fold, put their name on it, and number the pages. Monitor students and provide assistance as needed.

T *I will be showing you three pictures for only 30 seconds.*
T *Watch carefully.*

Place pictures of glaciers (page 11) under the document camera and allow students to look at pictures for 30 seconds. After 30 seconds take the pictures away.

Book: Page 1

T *What was your initial reaction, in other words what were your thoughts or questions?*
T *Please write your reaction on the top part of page 1 of your "Book."*

Put pictures back under document camera for 20 seconds.

T *What details in the pictures support your initial reaction?*
T *Write the details below your reaction on page 1 of your "Book".*

Give time for students to write their details. Monitor students and provide assistance as needed.

T *What jumps out at you when you look at the sequence of pictures?*
T *Write what jumped out at you when you looked at the sequence of pictures.*

Put pictures back under document camera and leave for next protocol.

Partner discussion protocol: Students will use: Back to Back and Face to Face while answering the 2 questions. Then use On your feet/ Get ready to meet/ Go and Greet to get a new partner. With their new partner, they will again use Back to Back and Face to Face while answering the same 2 questions. Continue this 2 Rounds. This would be a good time to review those 2 protocols before beginning.

Back to Back and Face to Face
- When in pairs, direct students to stand back to back
- Ask the students to consider the question
- Give students at least a minute to consider their response

On your feet/ Get ready to meet/ Go and Greet (should take less than one minute)
- Students stand up and put their hand up in the air
- Students find another student that has their hand up to have a "new" partner (and get them moving around)
- Once they are with their new partner, they put their hands down and face the teacher

Back to Back and Face to Face

Partner discussion:

1. What was your initial reaction to the pictures? Why?

2. When I initially saw the photos I (thought/observed/felt) _____.

After 2 rounds students return to their own seats.

T *Let us think like a scientist.*
T *What questions or wonderings do you have from the photos?*
T *Write at least 2 questions or wonderings at the bottom of page 1 in your "Book".*

Follow Ask, Answer, and Justify protocol for the next portion.

Ask, Answer, and Justify
- Put students in pairs: have them assign themselves a number 1 or 2
- Roles for number assignments:
  - 1's will ask the question first and 2's will respond
  - Then 2's will ask the question and 1's will respond

Partner discussion:

Question:
What are you wondering about? Why?
Response:
As a scientist, I (questioned/wondered/thought) _____.

Note:
Tell students to consider their previous conversation and revise/improve their details and "jump at me" statements.

Book: Page 2

T *On page 2 of your book you are going to write what you believe is happening to the glaciers.*
T *In other words, in two or three sentences, what is the main idea of the photographs?*
T *Write your answers in the bottom half of page 2.*
T *Add illustrations to validate your answers.*

Make sure to "Break Up Your Day!"

Now is a great time to take a break and get students re-energized.
See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 17)

Instructional Plan: Segment 2: 30-45 minutes

Subject

- ELA; Informational Text: "The Mendenhall Glacier"
- Synthesize Text and Key Details, Cause & Effect, & Vocabulary

Objective

- Students will take literal interpretation of informational text to evaluation and synthesizing.
- Students will produce a "book" which includes: cause and effect, vocabulary and key details.

Materials

- **Required:** copies of Informational Text, (page 13), **or** display a copy on a document camera
- "Book" students began in segment 1
- pencil and crayons (markers or colored pencils)
- **Resources:** document camera or similar device to share color photos, text, and drawings with class
- **Optional:** dictionaries
- **Optional:** printable pictures (page 12) if technology is not available, color copies of the pictures are needed

Distribute Text #1 to the students.

- ***T*** *Please read Text #1 independently.*
- ***T*** ***Circle*** *one* ***unfamiliar word*** *in each paragraph.*
- ***T*** ***Underline*** *what you consider to be* ***important details*** *in the text.*
- ***T*** ***Take notes*** *in the margin of any* ***questions or wonderings*** *you have of the text.*

Give time to complete this task. Monitor students and provide assistance as needed.

Back to Back and Face to Face
- When in pairs, direct students to stand back to back
- Ask the students to consider the question
- Give students at least a minute to consider their response

- ***T*** *Now we are going to use* Back to Back and Face to Face *to share with a partner what you believe is the "gist of the text".*
- ***T*** *The "gist" means the main idea or essence of the text.*

Book: Page 3

- ***T*** *Now that you have had the opportunity to share ideas with a partner, it is time for you to write your own "gist".*
- ***T*** *Remember it is okay to modify your own answer after discussing with a partner.*
- ***T*** *On page 3 of your "book" please write 2-3 sentences at top of the page stating what you believe is the "gist" of "The Mendenhall Glacier".*

Give time to complete this task. Monitor students and provide assistance as needed.

On your feet/ Get ready to meet/ Go and Greet (should take less than one minute)
- Students stand up and put their hand up in the air
- Students find another student that has their hand up to have a "new" partner (and get them moving around)
- Once they are with their new partner, they put their hands down and face the teacher

On your feet/ Get ready to meet/ Go and Greet
(students take Text #1 and their book/pencil)
then Back to Back and Face to Face protocol

Partner discussion:

Ask your partner:

"What details did you underline that support what you believe the text is about?"

Reply using sentence frame:

The details I underlined are _____because_____.

- ***T*** *Create a list of details that support your "gist" statement on page 3.*
- ***T*** *We will now use* On your feet/ Get ready to meet/ Go and Greet *to find a new partner to ask and reply to the same questions.*
- ***T*** *Remember this is a good time to add details to your "gist" list.*
- ***T*** *Make sure to take your text #1, your book, and your pencil with you when you go to find a new partner.*

On your feet/ Get ready to meet/ Go and Greet
(students take Text #1 and their book/pencil)
then Back to Back and Face to Face protocol

Partner discussion:

- ***T*** *We will now use* On your feet/ Get ready to meet/ Go and Greet *to find our last new partner to ask and reply to the same questions.*
- ***T*** *Remember this is a good time to add details to your "gist" list.*

Give time to complete this task. Monitor students and provide assistance as needed.

- ***T*** *Now that you have met with 3 partners and hopefully added details to your list, please return to your own seat.*
- ***T*** *Reread paragraph #1 in "The Mendenhall Glacier".*
- ***T*** ***Underline*** *the phrase* ***"the Little Ice Age".***
- ***T*** *What details in paragraph #1 help you understand and "see" the Little Ice Age?*
- ***T*** *Work with a partner to find the details that support the reader's' understanding of the Little Ice Age.*

Give time to complete this task. Monitor students and provide assistance as needed.

Place the pictures back under the document camera.

- ***T*** *What details in the picture(s) help you paint a picture in your mind of what the Little Ice Age looked like 3,000 years ago?*
- ***T*** *Write at least 3 details from the pictures that help you "paint the mental picture" in your mind.*

Follow the Back to Back and Face to Face protocol

Partner discussion:

Students ask:

"What details did you decide helped you "see" the Little Ice Age" from the pictures?"

Give time to complete this task. Monitor students and provide assistance as needed.

Add details to page 3:

T *Add one new detail that your partner shared at the bottom of page 3.*

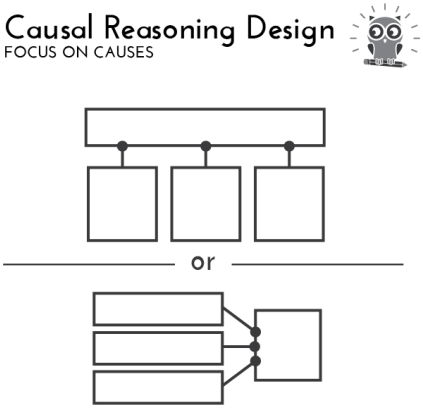
Book: Page 4

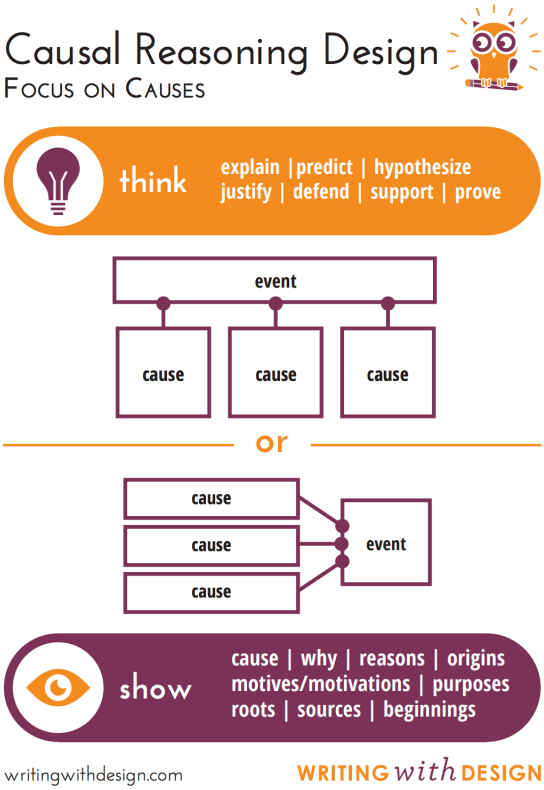
T *Scientists are always considering cause & effect relationships.*

Create and display "Cause and Effect" organizer on document camera Sample Cause and Effect Graphic Organizer found on the right.

T *You are going to recreate this graphic organizer on page 4 of your book.*

T *Reread "The Mendenhall Glacier" looking for a cause and an effect.* Possible answer: Cause: when the glacier moves; Effect: the debris leaves horizontal gouges in the rock walls





Make sure to "Break Up Your Day!"

Now is a great time to take a break and get students re-energized.
See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 17)

Instructional Plan: Segment 3: 45 minutes

Subject

- ELA; Informational Text: "The Mendenhall Glacier" & "Thermal Expansion"
- Synthesize Text and Key Details, Cause & Effect, Vocabulary, and Summary

Objective

- Students will take literal interpretation of informational text to evaluation and synthesizing.
- Students will produce a "book" which includes: cause and effect, vocabulary and key details.
- Students will analyze informational text to identify the message or purpose of the text.
- Students will use the "book" they create to write a summary of the informational texts.

Materials

- **Required:** copies of Informational Texts (1 & 2), (pages 13-14)), **or** display a copy on a document camera
- "Book" students began in segment 1 & 2
- lined pieces of paper
- pencil and crayons (markers or colored pencils)
- **Resources:** document camera or similar device to share

Distribute Text #2: "Thermal Expansion"

Introduction

T *You are now going to read "Thermal Expansion" like a scientist and find a second cause and effect.*
T *Please read "Thermal Expansion" independently.*

Give time to complete this task. Monitor students and provide assistance as needed.

T *What is causing the icebergs to melt?*
T *Now you will reread "Thermal Expansion" with a buddy.*
T *I would like you to take turns and alternate sentences.*

Give time to complete this task. Monitor students and provide assistance as needed.

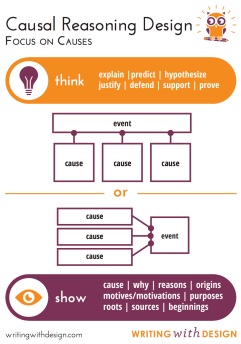
Ask, Answer, and Justify

(students take Text #2 and their cause & effect graphic organizer/pencil)
then Give one & Get one protocol

Ask, Answer, and Justify
- Put students in pairs: have them assign themselves a number 1 or 2
- Roles for number assignments:
  - 1's will ask the question first and 2's will respond
  - Then 2's will ask the question and 1's will respond

Give one & Get one
- Students share information in Ask & Justify
- Each student in the pair writes down the information shared by their partner
- If the information is already written, a check is put by the information

T *Now with your partner you are going to first Ask, Answer, and Justify and then Give one & Get one*
T *This will help you to add more details to your graphic organizer.*
T *Complete your Cause and Effect Graphic Organizers with your partners using "Thermal Expansion".* Example: Cause: object changes temperature; Effect: the object expands or contracts



Give time to complete this task. Monitor students and provide assistance as needed.

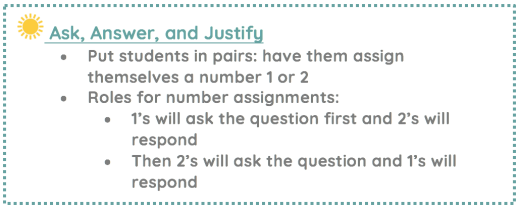
- ***T*** *Please return to your original seats.*
- ***T*** *Books need titles, illustrations, and captions for any pictures.*
- ***T*** *It is time to finalize your "Book" with a title, illustrations and captions to clarify your ideas.*

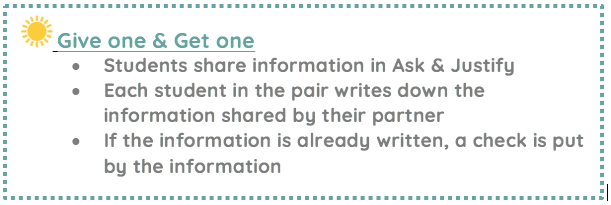
Purpose/Message of Informational Text

- ***T*** *Informational texts include a purpose or message.*
- ***T*** *We are going to discover the message and/or purpose for these informational texts.*
- ***T*** *I would like you to create a list (#1-4) on bottom half of page 4.*

Give time to complete this task. Monitor students and provide assistance as needed.

- ***T*** *First, let us see if you can think of two possible purposes for the two informational texts.*
- ***T*** *On your paper, please write your ideas for the possible messages next to your #1.* Examples: teach us about glacier movement, describe the effect of glaciers on landforms.





Ask, Answer, and Justify
Then
Give one & Get one

- ***T*** *Make sure you have at least* ***2 purposes*** *next to #1 on your paper.*
- ***T*** *Next, we will be finding details from the text to support your possible messages.*
- ***T*** ***Circle*** *the purpose in number #1 that can be* ***proven with textual evidence****.*
- ***T*** *You will need to find* ***three details*** *from the texts that* ***support the purpose****.*
- ***T*** *Try to use the* ***exact words*** *from the text to support your purpose.*
- ***T*** *Make sure you place exact words in quotation marks.*
- ***T*** *For example: If the purpose has been identified as teaching the reader about glaciers and their change over time, I could write… "The author emphasizes movement throughout The Mendenhall Glacier by using the words "crept". "travels" and "journey."*
- ***T*** *Now you will complete three details (#2-4) independently.*

Pass out 1 piece of lined paper per student.

Writing a Summary

- ***T*** *On your paper write, "I will organize key details to prove a theme for the texts."*
- ***T*** *You will write 5 to 7 sentences summarizing the informational texts.*
- ***T*** *You may use your informational texts, your book you created and your Cause and Effect Graphic Organizer.*
- ***T*** *Make sure that you edit your work.*
- ***T*** *You should be focusing on your spelling mistakes, punctuation marks, and that your ideas make sense.*
- ***T*** *There are several things you need to make sure you do when writing your summary.*
- ***T*** *Indent the first line.*
- ***T*** *Use complete sentences.*
- ***T*** *Used transition words.*
- ***T*** *Use details from the text and place the exact words from the text in quotes.*

T *And last, be sure you finished with a concluding sentence.*
T *You should be focusing on your spelling mistakes, punctuation marks, that your ideas make sense.*
T *Once you have finished I will let you read your summary with either a buddy or the whole class.*

Students share their sentences as the writing process continues.

Checklist for TEACHERS

- I indented the first line only
- I started with a topic sentence (example: "The informational text demonstrates how movement is found in glaciers, icebergs and in ice cubes.
- I used complete sentences
- I used transition words (first, next, then, last)
- I used details from the text and placed the exact words from the text within quotes (example: One example of movement is demonstrated when the iceberg is seen "calving into the frigid water" from the glacier.)
- I finished with a concluding sentence (example: The informational text demonstrates the theme of movement through descriptions and scientific theory..)

Checklist for Students

- I indented the first line only
- I started with a topic sentence
- I used complete sentences
- I used transition words
- I used details from the text and placed the exact words from the text within quotes
- I finished with a concluding sentence

Make sure to "Break Up Your Day!"

Now is a great time to take a break and get students re-energized.
See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 17)

BONUS LESSON

Instructional Plan: Segment 4: 30 minutes

Subject

- Geometry and Science & Haiku Poem

Objective

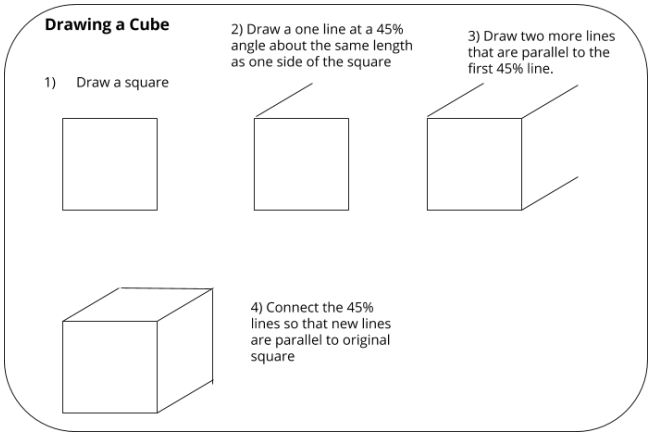
- Students will create a visual comparison of glaciers and ice cubes.
- Students will write a Haiku poem that captures the intent of "The Mendenhall Glacier."

Materials

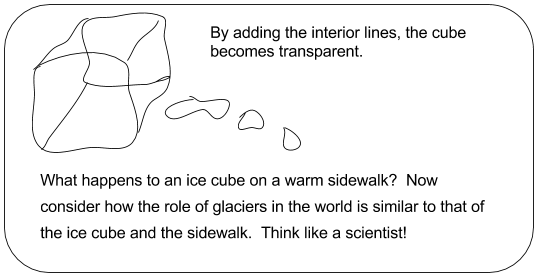
- **Required:** copies of Drawing cube activity on page 15 **or** display a copy on a document camera
- 1 piece of lined paper
- **Resources:** document camera or similar device to share

Part 1: "Geometry and Science!" (15 min) Drawing a Cube activity

Pass out 1 piece of lined paper per student. If you printed the handout on page 15 for students, pass that out as well.



T *We have been talking about glaciers today.*
T *What geometric solid or three-dimensional shape do you think of when you think of ice.*
T *Hint the answer is in a phrase we use to call ice.*
T *I may put an ice ____ in my drink.*
T *Who knows what shape I am referring to?* Call on students. Answer: cube
T *I am going to show you how to draw a cube today.*
T *On your piece of paper, first draw a square.* Model this on either the board or a document camera for students to follow. Give time for students to complete this step. Monitor and provide assistance as needed.



T *Next draw one line at a 45-degree angle, about the same length as one side of the square.* Model this on either the board or a document camera for students to follow. Give time for students to complete this step. Monitor and provide assistance as needed.
T *After that we will draw 2 more lines that are parallel, or run side by side, to the first 45-degree line.* Model this on either the board or a document camera for students to follow. Give time for students to complete this step. Monitor and provide assistance as needed.
T *Last, connect the 45 degree lines so that new lines are parallel to your original square.* Model this on either the board or a document camera for students to follow. Give time for students to complete this step. Monitor and provide assistance as needed.
T *Now, let's think like a scientist!*
T *What happens to an ice cube on a warm sidewalk?*
T *Now consider how the role of glaciers in the world is similar to that of the ice cube and the sidewalk.*
T *Turn and discuss your thoughts with a partner.*

Give time to complete this task. Monitor students and provide assistance as needed.

T *Let's share what you and your partner discussed.* **Call on students to share their ideas. Annotate their ideas on the board as they share.**

Part 2: "Writing a Haiku Poem" (15 min)

Start with the back side of lined piece of blank paper:

T *A Haiku poem has only three lines.*
T *The first line has five syllables, the second line has seven syllables, and the last line has five syllables.*
T *These lines usually do not rhyme.*
T *Can you capture the intent of "The Mendenhall Glacier" in a Haiku poem?*

Example of Haiku poem showing syllable count in parentheses:

"The Mendenhall Glacier": a Haiku Poem

Glaciers move slowly (5)
Brilliant blue is what's left (7)
Calve icebergs to sea (5)

T *You should be focusing on your spelling mistakes, punctuation marks, that your ideas make sense.*
T *There are several things you need to make sure you do when writing your Haiku poem.*
T *Make sure to write about the central message.*
T *Check to see the first line has 5 syllables, the second line has 7, and the third line has 5.*

Once you have finished I will let you read your Haiku poem with either a buddy or the whole class.

Rubric for Students

- I wrote about the intent (central message) of the text
- The first line has 5 syllables
- The second line has seven syllables
- The third line has five syllables

If there is time... Students may illustrate their Haiku poem.

Collect all papers and leave them for the teacher.

Make sure to "Break Up Your Day!"

Now is a great time to take a break and get students re-energized.
See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 17)

Photo A

Photo B

Photo C

Text #1

The Mendenhall Glacier

(1) The Little Ice Age began around 3,000 years ago. During this era the polar ice caps covered 32% of all land on the Earth. The polar ice caps had even crept into the tropical latitudes. When the ice caps eventually receded, they left behind glaciers that can still be seen today. One of these glaciers is the Mendenhall Glacier in Juneau (**joo**-noh), Alaska.

(2) The Mendenhall Glacier is a striking glacier emitting a vibrant blue hue. White, along with all other colors of the color spectrum, has been absorbed by the dense ice. The outcome is the only color visible to the human eye is cobalt blue. The impact of the unique color is captivating.

(3) A visitor to this magnificent glacier said, "The unreal blue draws your eyes as if magnetized to its depth and distinctiveness."

(4) Glaciers are rivers of ice which move slowly but surely downhill. The Mendenhall glacier travels at a rate of six to twelve inches per day. Caught inside the glacier are rocks and boulders. As might be expected when the glacier moves these rocks and boulders down the valley the debris leaves horizontal gouges in the rock walls.

(5) "The canyon's sides look like an enormous creature had clawed its way out of the ice. There are scars carved deep into the rock walls," averred a hiker.

(6) Where the Mendenhall Glacier meets Mendenhall Lake dozens of small icebergs float in the water. These icebergs were once part of the glacier before calving into the frigid water. They may slowly melt on their journey to the ocean, or if large enough, they will reach the Auke Bay as so many captured moments in time, held virtually intact inside their frozen memories.

Text #2

Thermal Expansion

(1) Have you ever seen an ice cube melt? Scientists can explain this everyday occurrence through the physics of thermal expansion.

(2) When an object changes temperature it expands, contracts, and can even change state. When you see an ice cube melt, it is warming and its state is changing from a solid to a liquid.

(3) Thermal expansion is a physical property that explains how matter changes in shape, area, and volume when its temperature is changed.

(4) If ice is exposed to heat, like sunlight or warm water, then thermal expansion will take place.

(5) Large sheets of ice cover the northern and southern poles of the Earth. When sunlight warms their surfaces, the ice melts from the top. If the ice reaches a warmer part of the ocean, the ice melts also from the bottom.

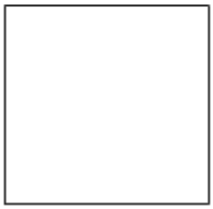
(5) What happens to an ice cube on a warm sidewalk? What is happening to glaciers? Consider how the role of glaciers in the world is similar to that of the ice cube and the sidewalk. Think like a scientist!

"Geometry and Science!"

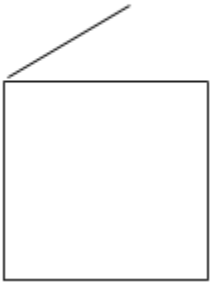
Drawing #1:

Drawing a Cube

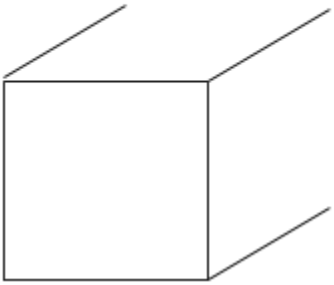
1) Draw a square

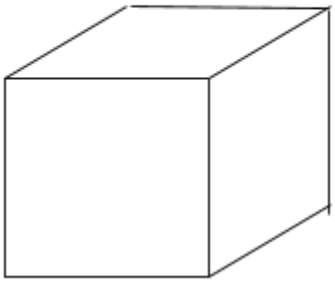


2) Draw a one line at a 45% angle about the same length as one side of the square

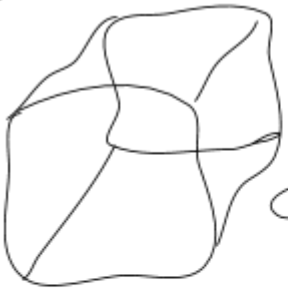


3) Draw two more lines that are parallel to the first 45% line.





4) Connect the 45% lines so that new lines are parallel to original square



By adding the interior lines, the cube becomes transparent.

What happens to an ice cube on a warm sidewalk? Now consider how the role of glaciers in the world is similar to that of the ice cube and the sidewalk. Think like a scientist!

Drawing #2:

Protocols:

Ask, Answer, and Justify

- Put students in pairs: have them assign themselves a number 1 or 2
- Roles for number assignments:
  - 1's will ask the question first and 2's will respond
  - Then 2's will ask the question and 1's will respond
  - The next time 2's ask the question first

On your feet/ Get ready to meet/ Go and Greet (should take less than one minute)

- Students stand up and put their hand up in the air
- Students find another student that has their hand up to have a "new" partner (and get them moving around)
- Once they are with their new partner, they put their hands down and face the teacher

Give one & Get one

- Students share information in Ask & Justify
- Each student in the pair writes down the information shared by their partner
- If the information is already written, a check is put by the information

Back to Back and Face to Face

- When in pairs, direct students to stand back to back
- Ask the students to consider the question
- Give students at least a minute to consider their response
- Have them turn face to face
- Follow the protocol for Ask and Justify

Share out and check for understanding

- Follow the protocol for Ask and Justify
- Ask students to share their response to the question
- Verify that response or conclusion is correct
- If needed, provide clarification

(Used throughout lesson - be familiar with each protocol.)

Note: Place Protocols under a document camera (if available) as necessary throughout the lessons

Make sure to "Break Up Your Day!"

These can be used in the middle of a lesson or at the end of your lesson.
Here are a few engaging movement and brain break ideas to get your students moving and ready to refocus!

Break Up Your Day: Thumbs Up!

- Student is called on (use name cards or equity cards if available) to state a quality they see in themselves (kindness, honesty, hard work, humor).
- Other students signify whether they see that quality in themselves.
- Tally their responses.
- The quality with the most votes or Thumbs Up is the theme for the classroom!

Break Up Your Day: Chain of Events!

- Teacher states: "I will start a story.
- You and your shoulder buddy must continue the story using only cause and effects.
- For example, if I said, "One day you were late to school…
- The effect could be you missed breakfast at school.
- The missed breakfast is now the cause and the effect of that is you couldn't concentrate during math.
- Lack of concentration is now the cause and the effect is you failed your math quiz.
- I had only four cause→effects: 1) late, 2) missed breakfast, 3) couldn't concentrate, 4) failed quiz.
- Keep going until you run out of time.
- I will give you one minute to see how many cause and effects you and your buddy can find for your Chain of Events!
- Your chain starts with, "One day I couldn't find my shoes…"
-

Break Up Your Day: Be a Scientist!

- A scientist separates fact from fiction or fact from opinion.
- Listen to these 3 statements: #1Today is a school day. #2 It is a good day to be a scientist. #3 We live on the planet Earth.
- Students show teacher which statement is an opinion (answer: #2).
- Now, turn to your buddy and create 3 facts or opinions. See if your buddy can be a scientist!
- Monitor student statements.
- Round 2 of "Be a Scientist" can include facts or opinions from the texts.

General Information

Lesson Parts & Duration

Total Duration: 2 to 2 ½ hours

- Segment 1: Adding and Subtracting Fractions with Unlike Denominators (60 Minutes)
- Segment 2: Adding and Subtracting Mixed Numbers with Unlike Denominators (60 Minutes)
- Segment 3: Game: "The Bigger, The Better!" (30-60 Minutes)

Subject(s)

- Adding/Subtracting with Unlike Denominators (5.NF.A1)

Objective

- Students will add and subtract fractions with unlike denominators through multiplying to find a like denominator. *For example*, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (*In general*, $a/b + c/d = (ad + bc)/bd$.)
- Students will add and subtract mixed numbers with unlike denominators through multiplying to find a like denominator.
- Students will add and subtract fractions and then compare their answers.

Materials

- **Required:** one of these options (printable game cards (pages 21-24) (1 set per pair) or index cards (48 per pair) or 6 pieces (per pair) of blank paper folded into eights and then cut into squares
- blank paper (2-3 per student per segment)
- pencil
- crayons/colored pencils
- scissors (if you printed off the cards or are cutting up paper)
- personal student dry erase boards & dry erase marker (if not available use paper and pencil)
- document camera or whiteboard
- **Optional:** printable "Exit Slips" (page 20)
- **Optional:** printable fraction cards (pages 21-24)
- **Optional:** printable "Break Up Your Day" brain/movement break ideas (page 25)

Instructional Setting

- Students should be seated with or near another student for partner work.

Throughout these lessons, you will find:

- ***Scripted Text*** indicates things that need to be said directly. Bullets starting with a **"T"** followed by *italicized type* indicate scripted text
- **Clarifiers** within scripted text are in orange
- **Teacher Directions** indicate things you should be doing
- **Side notes** provide helpful hints, ELL strategies, differentiation and information
- **Break Up Your Day** (Brain/Movement Breaks) are in green boxes (at the end)

Remember!

Quality over quantity. All components do not have to be accomplished; lessons may be ended at any time and resumed later.

Instructional Plan: Segment 1: 60 minutes

Subject

- Adding and Subtracting Fractions with Unlike Denominators

Objective

- Students will add and subtract fractions with unlike denominators using bar models.
- Students will add and subtract fractions with unlike denominators through multiplying to find a like denominator.

Materials

- blank paper (2-3 pieces per student)
- pencil
- crayons/colored pencils
- document camera or whiteboard
- **Optional:** printable Exit Slip (page 20)

Pass out 2-3 pieces of paper to each student. 1-2 will be for notes and 1 will be for practice.

Introduction

- ***T*** *Fractions show us parts of a whole.*
- ***T*** *Sometimes a fraction is part of a whole shape, like a piece of cake is a "fraction" of the cake.*
- ***T*** *Fractions can also be part of a set, like one student out of all of the students in this class, or a few pieces of candy from the whole bag of candy.*
- ***T*** *Those are "fractions" of a set.*
- ***T*** *Today we will be examining two fractions with unlike denominators and we will have the task of adding or subtracting them.*
- ***T*** *If you remember from 4th grade, if you have unlike denominators you cannot add or subtract until you create two like denominators.*
- ***T*** *Today we will be learning how to use our understanding of creating equivalent fractions through multiplication to find like denominators.*
- ***T*** *We will also be using the visual representation of a bar model to help us illustrate what we are doing mathematically.*

Setting up the Paper

- ***T*** *Write your name and date in the top right hand corner of your paper.* See example & model so students can follow.
- ***T*** *On the top center of your paper, title it "Notes".* See example & model so students can follow.
- ***T*** *Underneath your title write the statement, "I can add and subtract fractions with unlike denominators by multiplying each fraction by the other fraction's denominator."* See example & model so students can follow.
- ***T*** *Then next to it write: a/b + c/d = (ad + bc)/bd.*
- ***T*** *Below this statement write "Vocabulary".* See example & model so students can follow.
- ***T*** *The first vocabulary word we need to know is "fraction".*

Name & Date

Notes

I can add and subtract fractions with unlike denominators by multiplying each fraction by the other fraction's denominator.

a/b + c/d = (ad + bc)/bd

Vocabulary

- **T** *Let's define this in our "Notes" as: "A part of a whole shown using a numerator and denominator.* Write this definition into your notes so that the class can copy.
- **T** *Then we will write an example of a fraction, like* $\frac{2}{3}$.
- **T** *Now let's examine the parts of a fraction, we have a top number and a bottom number.*
- **T** *Does anyone know the name for either the top or bottom number of a fraction?*
- **T** *Discuss with the person next to you what you think we call them.* Call on several students. Answer: numerator and denominator.
- **T** *Let's add these names into our "Notes" and define them.*
- **T** *The top number of a fraction is the "Numerator".*
- **T** *Under fraction in your "Notes", write numerator and define it as: "The top number in a fraction that tells how many parts are being described."* Write this definition into your notes so that the class can copy.
- **T** *Using the previous example, the 2 in our fraction is the numerator.*
- **T** *Our bottom number in a fraction is called, the denominator.*
- **T** *Below numerator in your "Notes" write denominator.*
- **T** *We will define this as: "The bottom number in a fraction that tells how many equal parts are in the whole".* Write this definition into your notes so that the class can copy.
- **T** *In our example* $\frac{2}{3}$ *the 3 in this fraction is the denominator.*
- **T** *Ok, now that we have covered the basics, it's time to get down to business!*
- **T** *We are going to illustrate and list out the steps of how to add and subtract fractions with unlike denominators in our notes.*
- **T** *Then you will be able to look back and reference your notes later as you work!*

Bar Model Visual Representation

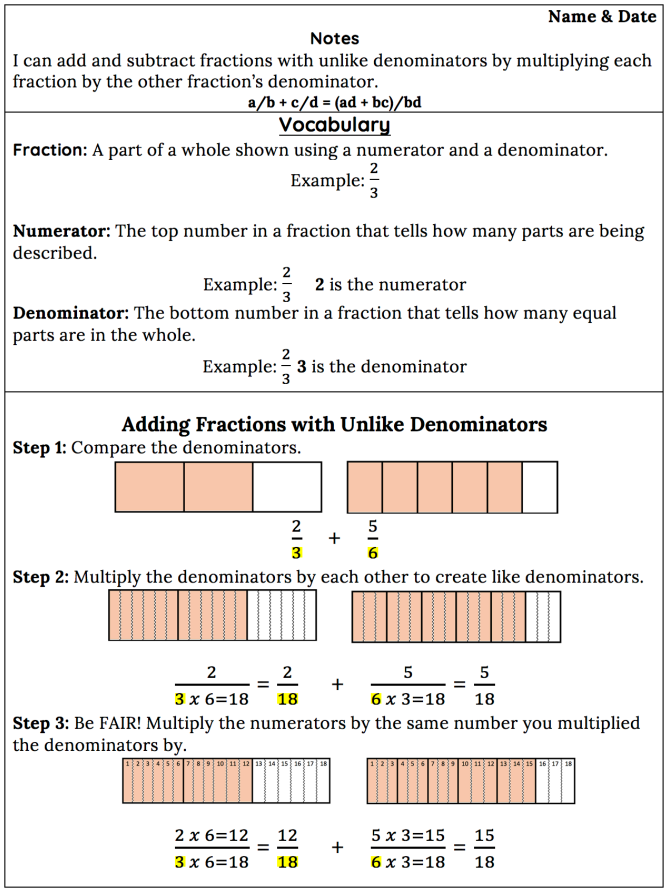
- **T** *Since we started with the fraction* $\frac{2}{3}$, *let's say that we have* $\frac{2}{3} + \frac{5}{6}$.
- **T** *Let's all write this problem into our notes.* Model this on your notes for students to copy.
- **T** *We are going to illustrate this by drawing 2 bar models above each fraction.*
- **T** *For* $\frac{2}{3}$ *separate your bar into 3 equal parts and shade 2 of those 3 parts.* Model this on your notes for students to copy.
- **T** *Then for* $\frac{5}{6}$ *we will illustrate this by drawing a second bar and dividing it into 6 equal parts and shading 5 of them.* Model this on your notes for students to copy.
- **T** *Look at these two denominators, I am going to highlight them to remind myself to compare them before adding.* Model this on your notes for students to copy.
- **T** *Are 3 and 6 the same?* Students should respond "No".
- **T** *Nope, they are not, so this tells me I am not ready to add yet.*
- **T** *The first thing I must do is create like denominators.*
- **T** *We will start with our bar model.* Only fill the bar models into your notes, leave room to write in the mathematical equations after. You will solve the whole problem first in bar models and then go back and fill in the equations below.
- **T** *If you remember, I told you that we would be using multiplication and multiply each fraction by the other fractions denominator.*
- **T** *The word multiply means to create more.*
- **T** *So, our whole will remain the same, but we need to divide it up into more pieces.*
- **T** *Because the denominator in my second fraction is 6, I need to separate each of my 3 pieces in my first fraction into 6 pieces.*
- **T** *To do that I will draw 5 lines in each third.* Model this for students to follow and copy.

Give time to complete this task. Monitor students and provide assistance as needed.

T *Then we need to take our fraction bar model for* $\frac{5}{6}$ *and separate each sixth into 3 equal pieces since the denominator in my first fraction is 3.* Model this for students to follow and copy.

Give time to complete this task. Monitor students and provide assistance as needed.

T *So, now you should have an equal number of spaces in each of your bar models.*
T *The first bar model I have 18 spaces, so my new denominator is 18 and my second bar model also has 18 spaces.*
T *Now I have like denominators.*
T *Let's count our numerators now and see how many we have.* Model counting the shaded pieces.
T *It looks like I now have 12 parts shaded in my first bar model giving me* $\frac{12}{18}$ *as my new fraction.*
T *Then, my second bar model has 15 parts shaded giving me* $\frac{15}{18}$ *as my new fraction.*
T *Now I am ready to add.*
T *Remember, when adding fractions I only add the numerators, the denominators stay the same.*
T *I am counting up or adding how many total shaded parts I have in all.*
T 12 + 18 = 27= $\frac{27}{18}$



Name & Date

Notes

I can add and subtract fractions with unlike denominators by multiplying each fraction by the other fraction's denominator.

a/b + c/d = (ad + bc)/bd

Vocabulary

Fraction: A part of a whole shown using a numerator and a denominator.

Example: $\frac{2}{3}$

Numerator: The top number in a fraction that tells how many parts are being described.

Example: $\frac{2}{3}$ **2** is the numerator

Denominator: The bottom number in a fraction that tells how many equal parts are in the whole.

Example: $\frac{2}{3}$ **3** is the denominator

Adding Fractions with Unlike Denominators

Step 1: Compare the denominators.

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

Step 2: Multiply the denominators by each other to create like denominators.

$\frac{2}{3 \times 6=18} = \frac{2}{18} + \frac{5}{6 \times 3=18} = \frac{5}{18}$

Step 3: Be FAIR! Multiply the numerators by the same number you multiplied the denominators by.

$\frac{2 \times 6=12}{3 \times 6=18} = \frac{12}{18} + \frac{5 \times 3=15}{6 \times 3=18} = \frac{15}{18}$

Mathematical Equations

T *Now that you can see visually, I would like to show you the math behind this.*
T *Step 1 is to compare the denominators as we previously did.*
T *They are different, so I need to create like denominators.*
T *Step 2, I will multiply each of the two denominators by each other.*
T *For example, my denominators are 3 and 6 so for my first fraction* $\frac{2}{3}$ *I will multiply 3 x 6 = 18.*
T *18 is my new denominator.*
T *Now for my second fraction,* $\frac{5}{6}$ *I need to multiply 6 x 3= 18.*
T *This is similar to a fact family, or the commutative property when multiplying two numbers by each other I will always get the same or like products, regardless of the order.*
T *So, my new denominator for this fraction is 18 as well.*
T *Although I have found like denominators I am still not ready to add.*

T *I need to be fair, you wouldn't like it if I gave a candy bar to one student and not to you right?*

T *So, in order to be fair I must multiply the numerator of each fraction by the denominator of the other fraction.*

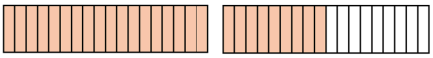
T *In my fraction* $\frac{2}{3}$ *I multiplied 3 x 6 and got 18, so my fraction is* $\frac{2}{18}$.

T *In order to be fair, since the denominator 3 was multiplied by 6, my numerator 2 must also be multiplied by 6.*

T *2 x 6= 12, so my new numerator is 12 and my denominator is 18, so my complete fraction is* $\frac{12}{18}$.

T *So if you look, I essentially multiplied my fraction* $\frac{2}{3} \times \frac{6}{6}$.

Step 4: Add the numerators



$$\frac{12}{18} + \frac{15}{18} = \frac{27}{18}$$

Step 5: Turn improper fraction into a Mixed Number by dividing (numerator ÷ denominator)

$$27 \div 18 = 1\frac{9}{18} \text{ or } (27\text{-}18\text{=}9)\ 1\frac{9}{18}$$

Step6: Simplify by dividing both the numerator and denominator by the same number.

$$1\frac{9}{18} \text{ or } 1\frac{1}{2}\left(\frac{9 \div 9=1}{18 \div 9=2}\right)$$

T $\frac{6}{6}$ *is equivalent to 1 whole, which is why the fraction* $\frac{2}{3}$ *maintains the same or equal value when I multiply both parts, just like when you multiply any whole number by 1, the value of that number is the same.*

T *Now, let's look at our second fraction* $\frac{5}{6}$.

T *We turned the denominator 6 into 18 by multiplying 6 x 3.*

T *So that turned our fraction to* $\frac{5}{18}$.

T *We can't forget to be fair!*

T *Since we multiplied 6 by 3 to get 18, we must now multiply our numerator by 3 as well.*

T *Again we are essentially multiplying our fraction* $\frac{5}{6} \times \frac{3}{3}$.

T *So, 5 x 3= 15, making this new fraction* $\frac{15}{18}$.

T *Finally!*

T *We have like denominators, we were fair to our numerators by changing those too, and now we are ready to add.*

T *When adding two fractions the denominators stay the same and we simply add the two numerators.*

T *12 + 15 = 27.*

T *So, my answer is* $\frac{27}{18}$.

T *This is an improper fraction, meaning the numerator is larger than the denominator.*

T *So, for our final step we will divide the numerator by the denominator.* $27 \div 18 = 1\frac{9}{18}$.

T *This creates a mixed number.*

T *I can also say the answer is* $1\frac{1}{2}$ *because* $\frac{9}{18}$ *can be simplified to* $\frac{1}{2}$.

Subtraction of Fractions with Unlike Denominators

T *On the backside of your notes I would like you to Title it "Subtracting Fractions with Unlike Denominators".*

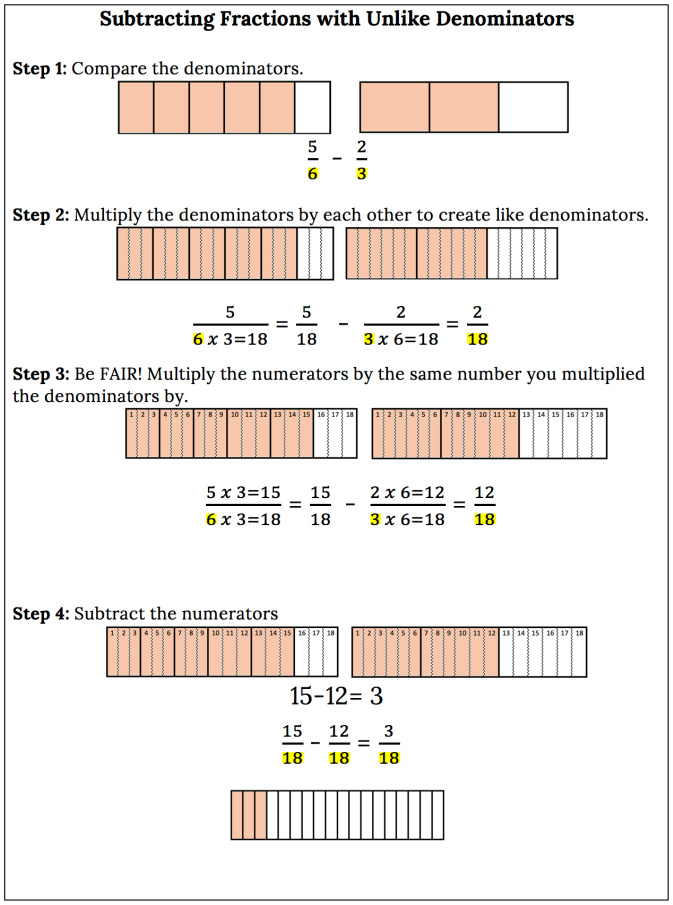
T *When we subtract fractions with unlike denominators we follow all of the same steps as addition, except we subtract.*

T *Let's do one sample problem quickly in our notes as a reference.*

T *Using the same fractions, we will flip flop them.*

T *Our equation will be* $\frac{5}{6} - \frac{2}{3}$.

Bar Model Visual Representation

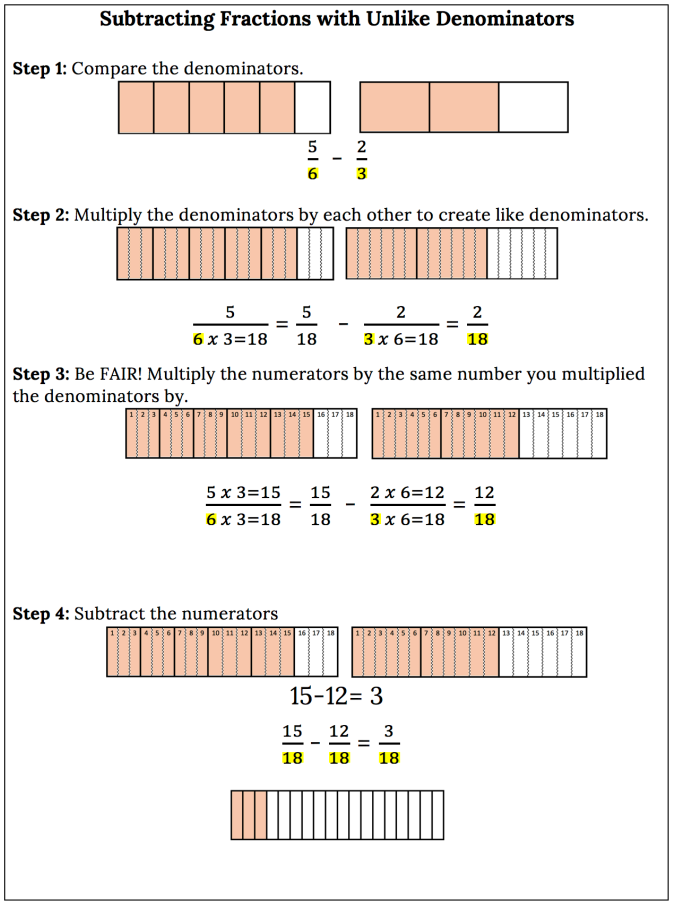


- ***T*** *First, we will illustrate these with bar models.*
- ***T*** *The first bar will be broken into 6 equal parts with 5 shaded and the second bar will be broken into 3 equal parts with 2 shaded.*
- ***T*** *Just like with our addition, we will split the sixths in our first bar into 3 equal pieces because that is the denominator of our second fraction.*
- ***T*** *Then we will split our thirds into six equal pieces because 6 is our denominator for our first fraction.*
- ***T*** *Now each bar should have 18 equal parts which is our new denominator.*
- ***T*** *Let's count the shaded pieces in each to identify our new numerators.*
- ***T*** *The first bar has 15 parts shaded making the fraction* $\frac{15}{18}$.
- ***T*** *The second fraction has 12 parts shaded making the fraction* $\frac{12}{18}$.
- ***T*** *Now we are ready to subtract, if I were to take away 12 of the 15 pieces in my first bar I would be left with 3.*
- ***T*** *So, my answer is* $\frac{3}{18}$.
- ***T*** *This can be simplified because both 3 and 18 are divisible by 3 so my simplified fraction would be* $\frac{1}{6}$.
- ***T*** *But in an effort to save time, I will not add that into my notes.*

Mathematical Equations

- ***T*** *Now that you can see visually, I would like to show you the math behind this.*
- ***T*** *We will do this by multiplying the denominators by each other.*
- ***T*** *For example, my denominators are 6 and 3 so for my first fraction* $\frac{5}{6}$ *I will multiply 6 x 3 = 18.*
- ***T*** *18 is my new denominator.*
- ***T*** *Now for my second fraction,* $\frac{2}{3}$ *I need to multiply 3 x 6= 18.*
- ***T*** *So, my new denominator for this fraction is 18 as well.*
- ***T*** *Although I have found like denominators I am still not ready to subtract.*
- ***T*** *I need to be fair.*
- ***T*** *So, in order to be fair, I must multiply the numerator or each fraction by the denominator of the other fraction.*
- ***T*** *5 x 3= 15, so my new numerator is 15 and my denominator is 18, so my complete fraction is* $\frac{15}{18}$.
- ***T*** *Now, let's look at our second fraction* $\frac{2}{3}$.
- ***T*** *We turned the denominator 3 into 18 by multiplying 3 x 6.*
- ***T*** *So that turned our fraction to* $\frac{2}{18}$.
- ***T*** *We can't forget to be fair!*
- ***T*** *Since we multiplied 3 by 6 to get 18, we must now multiply our numerator by 6 as well.*

- ***T*** *So, 2 x 6= 12, making the new fraction* $\frac{12}{18}$.
- ***T*** *Finally!*
- ***T*** *We have like denominators, we were fair to our numerators by changing those too and now we are ready to subtract.*
- ***T*** *When subtracting two fractions the denominator stays the same and we simply subtract the two numerators.*
- ***T*** *15 - 12 = 3.*
- ***T*** *So, my answer is* $\frac{3}{18}$.



Independent Practice

- ***T*** *Now that you have all of these helpful notes it is time to practice!*
- ***T*** *You may choose to either work independently or with a partner.*
- ***T*** *However, if you are working with a partner and are off task you will lose your privilege of working with a partner.*
- ***T*** *Also remember when working with a partner one person shouldn't be doing all the work.*
- ***T*** *We are going to fold our second piece of paper into 8 equal sections.*
- ***T*** *Fold your paper in half vertically.* Model this for students to follow.
- ***T*** *Then fold it in half horizontally and then in half again.* Model this for students to follow.
- ***T*** *Once you open it up you should have 8 equal squares.*
- ***T*** *After you copy down these 8 problems you may begin.*
- ***T*** *Remember to show a bar model for at least 4 of your problems.*

Project the problems on the next page using a document camera for students to copy or write them on the whiteboard. Answers found below.

Answers: 1.) $\frac{7}{24}$ 2.) $1\frac{1}{6}$ 3.) $\frac{32}{24}$, or $1\frac{8}{24}$, or $1\frac{1}{3}$ 4.) $\frac{1}{12}$ 5.) 0 or $\frac{0}{20}$ 6.) $\frac{7}{12}$ 7.) $\frac{5}{6} + \frac{1}{2} = \frac{16}{12}$ or $1\frac{4}{12}$ or $1\frac{1}{3}$
8.) $\frac{7}{8} - \frac{2}{6} = \frac{13}{24}$

Adding and Subtracting Fractions with Unlike Denominators Practice Problems

1. $\frac{5}{8} - \frac{1}{3}$	**2.** $\frac{2}{3} + \frac{1}{2}$
3. $\frac{2}{4} + \frac{5}{6}$	**4.** $\frac{3}{4} - \frac{2}{3}$
5. $\frac{5}{10} - \frac{1}{2}$	**6.** $\frac{1}{4} + \frac{1}{3}$
7. Marsha is making hair bows for her granddaughters. She is using 2 different colors. She needs to cut $\frac{5}{6}$ of a foot of the pink ribbon and $\frac{1}{2}$ of a foot of the gold ribbon. What is the total amount of ribbon Marsha will be using to make the hair bow?	**8.** Tony is building a tree house. This is his first time cutting wood. Somehow, he mismarked the wood and cut too much. He cut $\frac{7}{8}$ of a yard, but he needs $\frac{2}{6}$ less. What fraction of a yard will his new piece of wood be?

If time call students up to solve each problem to review answers with the class. Provide clarification and correction as needed based on their answers.

Make sure to "Break Up Your Day!"

Now is a great time to take a break and get students re-energized.
See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 25)

***You may use the exit slip at the end of this lesson as a quick assessment of student understanding. Either print them out (page 20), or simply have students copy the problems on a half sheet of paper.**

Name: ___ANSWER KEY____Date: _____

Exit Slip: Segment 1

Adding and Subtracting Fractions with unlike denominators.

Directions: Add or subtract each showing all steps. Illustrate at least 2 of the 4 problems using a bar model.

1.) $\frac{2}{4} - \frac{1}{3}$

$\frac{2 \text{ X } 3=6}{4 \text{ X } 3=12} - \frac{1 \text{ X } 4=4}{3 \text{ X } 4=12}$

$\frac{6}{12} - \frac{4}{12} = \frac{2}{12}$

Simplified $\frac{2 \div 2}{12 \div 2} = \frac{1}{6}$

Answer: $\frac{2}{12}$ or $\frac{1}{6}$

2.) $\frac{3}{6} + \frac{3}{4}$

$\frac{3 \text{ X } 4=12}{6 \text{ X } 4=24} + \frac{3 \text{ X } 6=18}{4 \text{ X } 6=24}$

$\frac{12}{24} + \frac{18}{24} = \frac{30}{24}$

$30 \div 24 = 1\frac{6}{24}$

Simplified $1\frac{6 \div 6}{24 \div 6} = 1\frac{1}{4}$

Answer: $1\frac{6}{24}$ or $1\frac{1}{4}$

3.) $\frac{2}{8} + \frac{1}{2}$

$\frac{2 \text{ X } 2=4}{8 \text{ X } 2=16} + \frac{1 \text{ X } 8=8}{2 \text{ X } 8=16}$

$\frac{4}{16} + \frac{8}{16} = \frac{12}{16}$

Simplified $\frac{12 \div 4}{16 \div 4} = \frac{3}{4}$

Answer: $\frac{12}{16}$ or $\frac{3}{4}$

4.) $\frac{7}{8} - \frac{1}{3}$

$\frac{7 \text{ X } 3=21}{8 \text{ X } 3=24} - \frac{1 \text{ X } 8=8}{3 \text{ X } 8=24}$

$\frac{21}{24} - \frac{8}{24} = \frac{13}{24}$

Answer: $\frac{13}{24}$

Instructional Plan: Segment 2: 60 minutes

Subject

- Adding and Subtracting Mixed Numbers with Unlike Denominators

Objective

- Students will add and subtract mixed numbers with unlike denominators using bar models.
- Students will add and subtract mixed numbers with unlike denominators through multiplying to find a like denominator.

Materials

- blank paper (2-3 pieces per student)
- pencil & crayons/colored pencils
- document camera or whiteboard
- **Optional:** printable Exit Slip (page 20)

Pass out 2-3 pieces of paper per student. It would be helpful for them to have their notes out from segment 1.

Introduction

T *Today we have been discussing fractions, those numbers that are part of a whole.*
T *We have learned that when adding fractions, we cannot begin until we have like denominators.*
T *Please turn and tell a partner everything you know about adding and subtracting fractions with unlike denominators.*

Give time to complete this task. Monitor students and provide assistance as needed.

T *In order to add and subtract fractions with unlike denominators we created like denominators by multiplying both our numerator and denominator by the other fraction's denominator.*
T *This created a new, equivalent fraction that had a like denominator.*
T *Next, we solved by adding the two numerators.*
T *Once we got our answer, we examined to see two things.*
T *First if it was improper, meaning the numerator was greater or larger than the denominator and then if we could simplify or reduce our fraction to a smaller basic fraction.*
T *We also used a visual model, called a bar model, to show how we multiplied or increased the number of pieces in our bar, while keeping the value of the original fraction the same.*
T *Now we will be taking this a step further by adding and subtracting mixed numbers.*
T *I like to think of mixed numbers like a can of mixed nuts.*
T *In the can, they are all nuts, but there are different kinds, so I can in fact sort them by peanuts, cashews, almonds, etc.*
T *In a mixed number, I have 2 kinds of numbers.*
T *I have whole numbers and fractions or parts of a whole.*
T *Just like earlier we will be solving equations using both a visual bar model and a mathematical equation.*
T *I would like to solve 2 problems, an addition, and subtraction problem in your notes before you practice on your own or with a partner.*
T *The goal at the end of this lesson is for you to be so comfortable with adding and subtracting fractions and mixed numbers with unlike denominators that you are ready to play a game!*

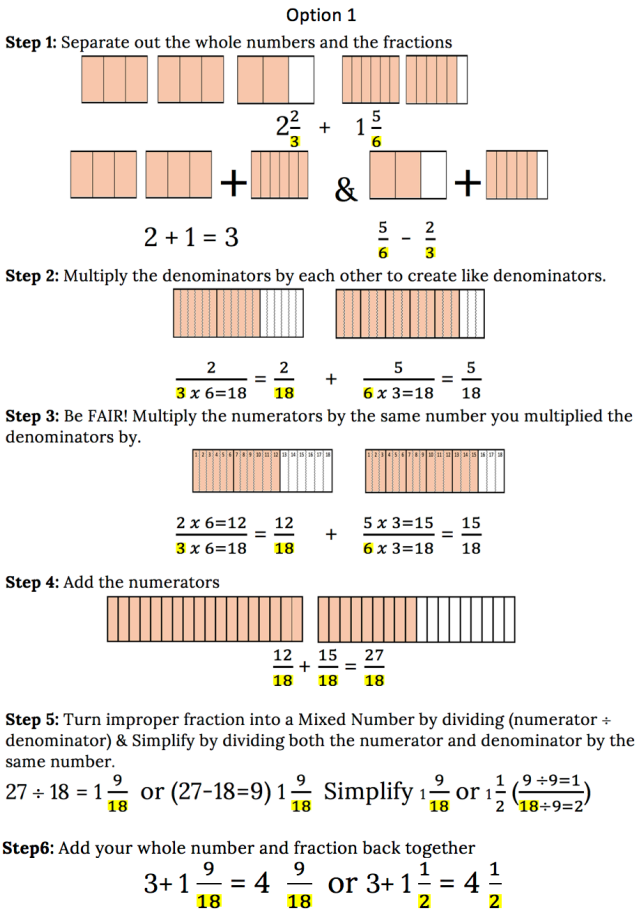
Setting up the Paper

T *Turn your paper horizontally.*
T *Write your name and date in the top right hand corner of your paper.* Model so students can follow.
T *On the top center of your paper, title it "Notes".* Model so students can follow.

- ***T*** *Underneath your title write the statement, "I can add and subtract mixed numbers with unlike denominators by multiplying each fraction by the other fraction's denominator."* Model so students can follow.
- ***T*** *Next to it write: a/b + c/d = (ad + bc)/bd.*
- ***T*** *Then draw a line underneath your I can statement and write Adding Mixed Numbers with Unlike Denominators.*
- ***T*** *After that, draw a line vertically to separate your space into 2 parts.*
- ***T*** *We are doing this because there are 2 ways you can solve this.*
- ***T*** *The first is by separating like numbers and then adding.*
- ***T*** *What I mean is in a mixed number we have whole numbers and fractions.*
- ***T*** *So, I will group my whole numbers together and add those.*
- ***T*** *Then I will group my fractions together and add those.*
- ***T*** *Last I will combine the two answers to get my final answer.*
- ***T*** *The second option is to first turn both of my mixed numbers into improper fractions.*
- ***T*** *Let me show you what I mean, please follow along and write everything I am writing into your notes.*
- ***T*** *We will start on the left side.*

Option 1

- ***T*** *I will call it "Option 1".*
- ***T*** *We will start by writing out our equation and drawing a visual bar model above.*
- ***T*** $2\frac{2}{3}+1\frac{5}{6}$ *and above it I will draw 2 whole bars, each separated into thirds with all parts shaded and one additional bar separated into thirds with 2 of the 3 parts shaded.* See example on the right and copy this into your notes.
- ***T*** *For our second fraction, I will draw 1 whole bar separate into sixth with all 6 parts shaded and then an additional bar with sixth, but only 5 of the 6 parts shaded.* See example on the right and copy this into your notes.
- ***T*** *Step 1: Separate out the whole numbers*
- ***T*** *Put the whole numbers on the left and the fractions on the right.* See example on the right and copy this into your notes.
- ***T*** *You are able to add your whole numbers during this step, but not the fractions because they have unlike denominators.*
- ***T*** $2 + 1 = 3$
- ***T*** *Step 2: Multiply denominators to create like denominators.*
- ***T*** $\frac{2}{3 \times 6=18}=\frac{2}{18}$ + $\frac{5}{6 \times 3=18}=\frac{5}{18}$ See example on the right and copy this into your notes.
- ***T*** *Draw visual model separating each into 18 pieces by dividing each third into six equal parts and dividing each sixth into 3 equal parts.* See example on the right and copy this into your notes.
- ***T*** *Step 3:Be FAIR! Multiply the numerators by the same number you multiplied the denominators.*



T $\frac{2 \times 6=12}{3 \times 6=18} = \frac{12}{18} + \frac{5 \times 3=15}{6 \times 3=18} = \frac{15}{18}$ See example on the previous page and copy this into your notes.

T *Step 4: Add the numerators.*

T $\frac{12}{18} + \frac{15}{18} = \frac{27}{18}$ See example on the previous page and copy this into your notes.

T *Step 5: Turn your improper fraction into a mixed number.*

T $27 \div 18 = 1\frac{9}{18}$ See example on the previous page and copy this into your notes.

T *Step 6: Add your whole number and fraction back together.*

T $3 + 1\frac{9}{18} = 4\frac{9}{18}$ *or* $4\frac{1}{2}$ See example on the previous page and copy this into your notes.

Option 2

T *We will start by writing out our equation and drawing a visual bar model above.*

T $2\frac{2}{3} + 1\frac{5}{6}$ *and above it I will draw 2 whole bars, each separated into thirds with all parts shaded and one additional bar separated into thirds with 2 of the 3 parts shaded.* See example on the right and copy this into your notes.

T *For our second fraction, I will draw 1 whole bar separate into sixth with all 6 parts shaded and then an additional bar with sixth, but only 5 of the 6 parts shaded.* See example on the right and copy this into your notes.

T *Step 1: Turn the mixed numbers into improper fractions and count all the pieces.*

T $2 = \frac{3}{3} + \frac{3}{3} = \frac{6}{3}$ *then* $\frac{6}{3} + \frac{2}{3} = \frac{8}{3}$ See example on the right and copy this into your notes.

T *Then for the second fraction* $1 = \frac{6}{6}$ *then* $\frac{6}{6} + \frac{5}{6} = \frac{11}{6}$ See example on the right and copy this into your notes.

T *Step 2: Multiply the denominators by each other to create like denominators.*

T $\frac{8}{3 \times 6=18} = \frac{8}{18} + \frac{11}{6 \times 3=18} = \frac{11}{18}$ See example on the right and copy this into your notes.

T *Step 3: Be Fair! Multiply the numerators by the same number you multiplied the denominators by.*

T $\frac{8 \times 6=48}{3 \times 6=18} = \frac{48}{18} + \frac{11 \times 3=33}{6 \times 3=18} = \frac{33}{18}$

T See example on the right and copy this into your notes.

T *Step 4: Add the numerators.*

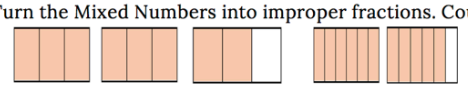
T $\frac{48}{18} + \frac{33}{18} = \frac{81}{18}$ See example on the right and copy this into your notes.

T *Step 5: Turn the improper fraction into a mixed number by dividing the numerator by the denominator and simplify.*

T $81 \div 18 = 4\frac{9}{18}$ *Simplify* $4\frac{9}{18}$ *or* $4\frac{1}{2}\left(\frac{9 \div 9=1}{18 \div 9=2}\right)$ See example on the right and copy this into your notes.

Option 2

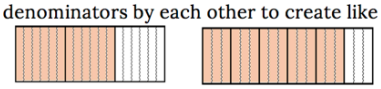
Step 1: Turn the Mixed Numbers into improper fractions. Count all the pieces.



$$2\frac{2}{3} + 1\frac{5}{6}$$

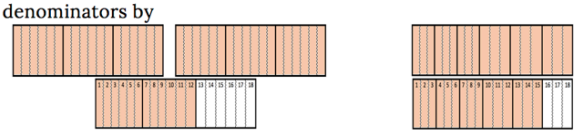
$2 = \frac{3}{3} + \frac{3}{3} = \frac{6}{3}$ then $\frac{6}{3} + \frac{2}{3} = \frac{8}{3}$ $\quad 1 = \frac{6}{6}$ then $\frac{6}{6} + \frac{5}{6} = \frac{11}{6}$

Step 2: Multiply the denominators by each other to create like denominators.



$$\frac{8}{3 \times 6=18} = \frac{8}{18} + \frac{11}{6 \times 3=18} = \frac{11}{18}$$

Step 3: Be FAIR! Multiply the numerators by the same number you multiplied the denominators by



$$\frac{8 \times 6=48}{3 \times 6=18} = \frac{48}{18} + \frac{11 \times 3=33}{6 \times 3=18} = \frac{33}{18}$$

Step 4: Add the numerators

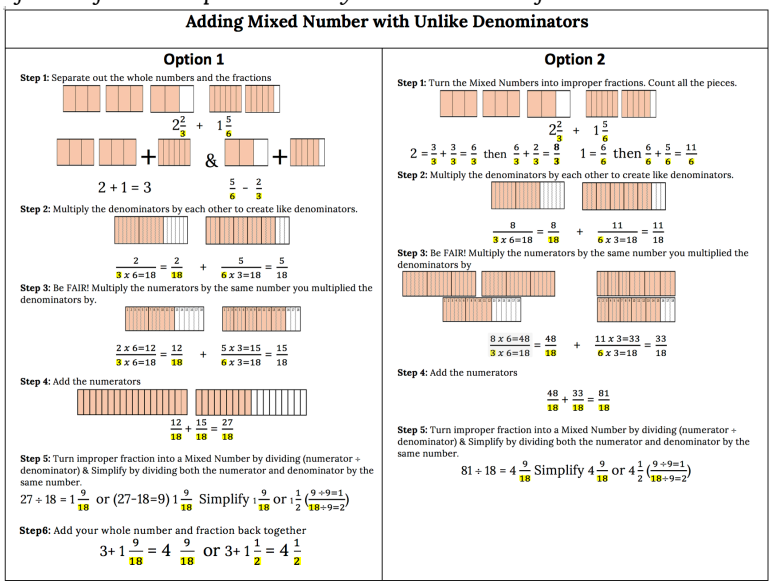
$$\frac{48}{18} + \frac{33}{18} = \frac{81}{18}$$

Step 5: Turn improper fraction into a Mixed Number by dividing (numerator ÷ denominator) & Simplify by dividing both the numerator and denominator by the same number.

$$81 \div 18 = 4\frac{9}{18} \text{ Simplify } 4\frac{9}{18} \text{ or } 4\frac{1}{2}\left(\frac{9 \div 9=1}{18 \div 9=2}\right)$$

Subtracting Mixed Numbers

- ***T*** *With a partner on the backside of your notes I want you to try to subtract a problem using these two methods.*
- ***T*** *When subtracting fractions, many times you will need to use solution option 2.*
- ***T*** *Because although the first mixed number is larger than the second, that doesn't necessarily mean that the first fraction is larger alone.*
- ***T*** *So for example, if I had* $2\frac{2}{3} - 1\frac{5}{6}$, $2\frac{2}{3}$ *is greater or larger than* $1\frac{5}{6}$, *but if I pull out the whole numbers and try to do* $\frac{2}{3} - \frac{5}{6}$, *it won't work.*
- ***T*** *Because when I find like denominators my equations are* $\frac{12}{18} - \frac{15}{18}$, *we all know I cannot take 15 away from 12 (12-15).*
- ***T*** *In order to solve this equation, I would need to use option 2 and turn my fractions into improper fractions to ensure my first fraction is greater than the second.*
- ***T*** *Ok, on the backside of your paper, separate it in half.*
- ***T*** *On the left side write option 1 and on the right side write option 2.*
- ***T*** *I will give you this next equation in the form of a word problem so you will need to first determine your equation and then solve it using the 2 solution options.*



Partner Work

- ***T*** ***Problem 1:*** *Marco is throwing a party. He needs to go to the store to buy supplies. The Party Palace is* $2\frac{3}{4}$ *miles from his house. The Perfect Party Outlet is only* $1\frac{2}{5}$ *miles from his house. How much closer is the Perfect Party Outlet than the Party Palace?*

Project this problem using a document camera or write it on the board for students to copy.

Give time to complete this task. Monitor students and provide assistance as needed.

Once it appears most students have completed this, bring everyone back together to review the answer.

- ***T*** *Ok, eyes on me in 5-4-3-2-1.*
- ***T*** *Let's review the solutions you have found for this problem.*
- ***T*** *First we need to see what equation you determine needed to be solved.* **Call on several groups of students to share their equations.** Answer: $2\frac{3}{4} - 1\frac{2}{5}$
- ***T*** *Next, we need to see how you used the 2 options to solve this equation.*
- ***T*** *I need two groups to volunteer to write your solution on the board.* **Call on two to four groups to solve on the board.** Indicate to each group if you would like them to write their option 1 solution or their option 2 solution. Determine how many groups to go to the board and share their solutions based on how much board space is available.
- ***T*** *While the* 2 or 4 *groups are writing their solutions, I would like the rest of you to check their steps to see if they match yours.*
- ***T*** *Once they are finished, I will ask you if you agree or disagree with their solutions.*

T *If anyone disagrees with a solution will we will work through it again as a whole class.*

Monitor that students writing their solutions on the board are in fact writing the correct option. Also, circulate to ensure that all students are checking the answers on the board with their own.

T *Ok, eyes on me in 5-4-3-2-1.*
T *Does everyone agree with the solutions that these groups came up with?*
T *If not let's respectfully check their work, by solving it together as a class and see if we can find either your error or the group's error that is resulting in you or them getting a different answer.*

Call on students to share if they agree or disagree. If any groups disagree, solve the problem as a class on the board and look for the mistake. Provide any clarification based on any mistakes you note groups are making.

Answers: Solution Option 1:

$2\frac{3}{4} - 1\frac{2}{5} = 2 - 1 = 1$

$\frac{3}{4 \times 5=20} = \frac{3}{20} - \frac{2}{5 \times 4=20} = \frac{2}{20}$

$\frac{3 \times 5=15}{4 \times 5=20} = \frac{15}{20} - \frac{2 \times 4=8}{5 \times 4=20} = \frac{8}{20}$

$\frac{15}{20} - \frac{8}{20} = \frac{7}{20}$

$1 + \frac{7}{20} = 1\frac{7}{20}$

Solution Option 2:

$2\frac{3}{4} - 1\frac{2}{5} = 2 = \frac{4}{4} + \frac{4}{4} + \frac{3}{4} = \frac{11}{4} \quad 1 = \frac{5}{5} + \frac{2}{5} = \frac{7}{5}$

$\frac{11}{4 \times 5=20} = \frac{11}{20} - \frac{7}{5 \times 4=20} = \frac{7}{20}$

$\frac{11 \times 5=55}{4 \times 5=20} = \frac{55}{20} - \frac{7 \times 4=28}{5 \times 4=20} = \frac{28}{20}$

$\frac{55}{20} - \frac{28}{20} = \frac{27}{20}$

$27 \div 20 = 1\frac{7}{20}$

T *With our partner or independently we are now going to solve 2 more problems.*
T *You can choose now which option you prefer when solving addition and subtraction problems with mixed numbers.*
T *If you are able to solve both problems and still have time, try resolving them all using the other solution option.*

Project problems or write them on the board for students to solve. Answers on next page.

Adding and Subtracting Mixed Numbers with Unlike Denominators Practice Problems

1. Mary has several appointments after work. She needs to get a haircut at 4 p.m. The hair salon is $1\frac{2}{4}$ of a mile from her work. Then she has a dentist appointment at 5:45 p.m. The dentist office is $3\frac{2}{5}$ miles from the hair salon. How far does she need to drive to go to both appointments?	**2.** Juan is building a miniature version of his art project. His original art project is a clay pot. The pot is $3\frac{2}{6}$ inches tall, he wants the miniature version to be only $1\frac{1}{3}$ inches tall. How much smaller will the model be than his original clay pot?

Answers: 1.) $4\frac{9}{10}$ miles 2.) 2 inches smaller

*You may use the exit slip at the end of this lesson as a quick assessment of student understanding. Either print them out (page 20), or simply have students copy the problems on a half sheet of paper.

Name: _ANSWER KEY_____Date: _____

Exit Slip: Segment 2

Adding and Subtracting Mixed Numbers with Unlike Denominators.

Directions: Add or subtract each showing all steps. Choose either solution option 1 or 2 to solve.

1. Billy is riding his bike to school with his friend, Steve. Steve lives $1\frac{1}{2}$ miles from Billy. School is $2\frac{3}{4}$ miles from Steve's house. How many miles will Billy ride his bike in order to arrive at school?

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

$\frac{3 \times 4}{2 \times 4} = \frac{12}{8}$ $\frac{11 \times 2}{4 \times 2} = \frac{22}{8}$

$\frac{12}{8} + \frac{22}{8} = \frac{34}{8}$ $34 \div 8 = 4\frac{2}{8}$ or $4\frac{1}{4}$

2. Rita is painting book marks. She decided to use 2 different colors. The art supply store sells their paints by the ounce. Rita knows she will need $6\frac{4}{8}$ ounces of paint altogether. She wants her book marks to be mostly orange with accents of yellow. If she uses $5\frac{1}{3}$ ounces of orange, how much yellow paint will she need?

$6\frac{4}{8} - 5\frac{1}{3} =$

$(\frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{4}{8} = \frac{52}{8})(\frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{1}{3} = \frac{16}{3})$

$\frac{52 \times 3}{8 \times 3} = \frac{156}{24}$ $\frac{11 \times 8}{3 \times 8} = \frac{88}{24}$

$\frac{156}{24} - \frac{88}{24} = \frac{68}{24}$ $68 \div 24 = 2\frac{20}{24}$ or $2\frac{5}{6}$

Make sure to "Break Up Your Day!"

Now is a great time to take a break and get students re-energized.
See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 25)

Instructional Plan: Segment 3: 30-60 minutes

Subject

- Game: "The Bigger, The Better!" (adding and subtracting fractions with unlike denominators)

Objective

- Students will add and subtract fractions with unlike denominators through multiplying to find a like denominator.
- Students will create like denominators to compare their sum(s) and difference(s).

Materials

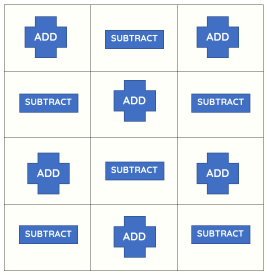
- **Required:** one of these options
  - printable game cards (pages 21-24) (1 set per pair)
  - index cards (48 per pair) or
  - 6 pieces (per pair) of blank paper folded into eights and then cut into squares
- document camera or whiteboard
- scissors (if you printed off the cards or are cutting up paper)
- personal student dry erase boards & dry erase marker (if not available use paper and pencil)

Print off one set of game cards (pages 16-19) for each pair or start lesson by having groups make their fraction cards.

$\frac{1}{2}$	$\frac{2}{2}$	$\frac{1}{3}$
$\frac{2}{3}$	$\frac{3}{3}$	$\frac{1}{4}$
$\frac{2}{4}$	$\frac{3}{4}$	$\frac{4}{4}$
$\frac{1}{5}$	$\frac{2}{5}$	$\frac{3}{5}$

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

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



Introduction

T *Today we will be playing a game called, "The Bigger, The Better!".*
T *In this game, you will be either adding or subtracting 2 different fractions with unlike denominators.*
T *Then, you and your partner will need to compare your sum(s) or answer to your addition problem or your difference(s) or the answer to your subtraction problem.*
T *However, in order to compare you will need to again find a like denominator.*
T *Whoever has the greater or larger fraction wins a point.*
T *We will start by getting our playing cards ready first and then I will explain to you how to play the game.*

Follow the "Getting Ready" section based on if you are creating cards or have printed them.

Getting Ready: Using Printable Game Cards

T *You and a partner will only need one set of cards to play with.*
T *When I say "Denominator," I want you to find a partner who you have not worked with already today.* Monitor that all students are finding partners, step in if students are struggling to pair up.
T *"Denominator!"*

- ***T*** *With your scissors, you need to carefully cut along the lines to cut out the 4 sheets of fraction cards and equation symbols (+ / -).*
- ***T*** *Split up the work with your partner so that everyone is working equally.*

Getting Ready: Using Printable Game Cards

- ***T*** *You and a partner will only need one set of cards to play with.*
- ***T*** *When I say "Denominator," I want you to find a partner that you have not worked with already today.* Monitor that all students are finding partners, step in if students are struggling to pair up.
- ***T*** *"Denominator!"*
- ***T*** *I will give each group (48 index cards or 6 pieces of blank paper to fold into eights and cut out).*
- ***T*** *You need to write 1 fraction per card.*
- ***T*** *We are writing halves, thirds, fourths, fifths, sixths, eighths, and tenths.*
- ***T*** *Remember that* $\frac{2}{2}, \frac{3}{3}, \frac{4}{4}, \frac{6}{6}, \frac{8}{8}, \frac{10}{10}$ *all need to be included.* List all 36 fractions on the board for them to reference and write on their cards. Skip $\frac{9}{10}$ and $\frac{10}{10}$.
- ***T*** *You will also need to write an addition symbol, the plus sign on 6 cards, and the subtraction symbol, the minus sign on 6 cards.*

How to Play

- ***T*** *Since the name of the game is, "The Bigger, The Better!", the goal of our game is to have the larger fraction.*
- ***T*** *You will start by mixing up all of the fraction cards and placing them in a stack face down.*
- ***T*** *Next to that, you need a stack of your equation symbols (+/-) face down as well.*
- ***T*** *You will play in rounds.*
- ***T*** *Each round both players will take 2 fraction cards from the top of the stack and one equation symbol.*
- ***T*** *Then on scratch paper, each player must create and solve their equation.*
- ***T*** *After solving your equation, you will then compare your final answer with your partners.*
- ***T*** *Whoever ends up with the greater or larger answer wins a point.*
- ***T*** *Sounds easy enough, right?!*
- ***T*** *Well there are a lot of steps and it is NOT a race.*
- ***T*** *You may help each other to solve your equations if you get confused or stuck.*
- ***T*** *It is not about how fast you solve your problem or who can solve it correctly alone.*
- ***T*** *It is in your best interest to make sure that your partner solved his/her problem correctly because if they didn't when you go to compare you may lose accidentally!*
- ***T*** *Let me show you what I mean by playing a practice round with you.*
- ***T*** *I am going to give you each* some scratch paper/dry erase boards *to solve your problems on.*

Pass out scratch paper, blank paper, or have students work on a personal dry erase board if available.

- ***T*** *You may use a bar model if visual models help you, but it is not necessary to do so.*

Practice Round Demonstrate spreading out cards face down to prepare to play.

- ***T*** *Now that everyone has their* paper/dry erase boards *we are ready to play.*
- ***T*** *Ok, the class will be "Team 1" and I will be "Team 2".*
- ***T*** *We need to start by mixing up all of our fraction cards and stacking them face down.* Model this for students to see.

T *Then, I will do the same with my equation symbol cards.* Model this for students to see.

T *Since you are all Team 1, I will let you pick your cards first.*

T *Let's say you picked* $\frac{1}{2}$ *and* $\frac{3}{4}$ *as your fraction cards.*

T *Then you picked an addition symbol.*

T *Because you have an addition symbol it doesn't matter what order you write your fractions, but for practice purposes I would like everyone to write* $\frac{1}{2} + \frac{3}{4} =$ *on their papers.*

T *This is your equation.*

T *Before you start to solve I must pick my cards.*

T *Let's imagine I picked* $\frac{5}{9}$ *and* $\frac{2}{3}$.

T *And then for my symbol I picked a subtraction card.*

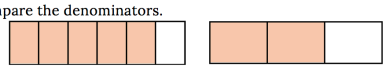
T *Since I know that with subtraction the larger number needs to go first I cannot write my equation until I find like denominators so I can determine which of these two fractions is greater or larger.*

T *We will be following the steps to add and subtract fractions with unlike denominators.*

T *You can use your notes from segment one to help you.* Sample notes found on the right.

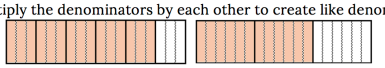
Subtracting Fractions with Unlike Denominators

Step 1: Compare the denominators.



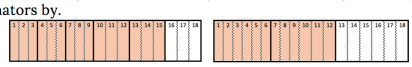
$\frac{5}{6} - \frac{2}{3}$

Step 2: Multiply the denominators by each other to create like denominators.



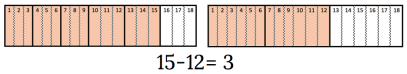
$\frac{5}{6 \times 3=18} = \frac{5}{18} - \frac{2}{3 \times 6=18} = \frac{2}{18}$

Step 3: Be FAIR! Multiply the numerators by the same number you multiplied the denominators by.



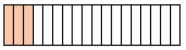
$\frac{5 \times 3=15}{6 \times 3=18} = \frac{15}{18} - \frac{2 \times 6=12}{3 \times 6=18} = \frac{12}{18}$

Step 4: Subtract the numerators



15-12= 3

$\frac{15}{18} - \frac{12}{18} = \frac{3}{18}$



T *Step 1, find like denominators by multiplying fractions by each other's denominator.*

T *Let's solve mine first and then we will solve yours.*

T *Pencils down so that you can follow along.* Full example written out on right.

Team 2 (Teacher) Example:

T *For my fractions* $\frac{5}{9}$ *and* $\frac{2}{3}$ *I need to multiply my denominator 9 in* $\frac{5}{9}$ *by my denominator 3 from* $\frac{2}{3}$.

T *9 x 3 = 27.*

T *Then I need to multiply my denominator 3 in* $\frac{2}{3}$ *by my denominator 9 in* $\frac{5}{9}$.

T *3 x 9 = 27.*

T *My new denominator for each fraction is 27.*

T *Now I need to be fair and do the same thing to my numerators.*

T *I need to multiply my numerator 5 in* $\frac{5}{9}$ *by my denominator 3 from* $\frac{2}{3}$.

T *5 x 3 = 15, so my new fraction is* $\frac{15}{27}$.

T *Next, I need to multiply my numerator 2 in* $\frac{2}{3}$ *by my denominator 9 from* $\frac{5}{9}$.

T *2 x 9 = 18, so my new fraction is* $\frac{18}{27}$.

T *Now looking at my two fractions* $\frac{15}{27}$ *and* $\frac{18}{27}$ *I can see that* $\frac{18}{27}$ *is greater than* $\frac{15}{27}$.

T *This means my equation will be* $\frac{18}{27} - \frac{15}{27}$ *because I know the larger fraction must go first.*

Team 2 (Teacher):

Step 1

$$\frac{5}{9} + \frac{2}{3} =$$

Step 2

$$\frac{5}{9 \times 3=27} + \frac{2}{3 \times 9=27}$$

Step 3

$$\frac{5 \times 3=15}{9 \times 3=27} + \frac{2 \times 9=18}{3 \times 9=27}$$

Step 4

$$\frac{18}{27} - \frac{15}{27} = \frac{3}{27}$$

T *Last, I will solve. 18-15 = 3, so my answer is* $\frac{3}{27}$ *or* $\frac{1}{9}$.

Team 1 (Student) Example: On right

T *Now I would like you to solve your equation and then we will compare and see who wins round 1.*

Give time for students to complete this task. Walk around and monitor students understanding.

Once most students appear to be done, write the solution on the board or project using a document camera. Solution on the right.

T *As you can see your answer should have been* $1\frac{2}{8}$ *or* $1\frac{1}{4}$ *if you simplified.*

T *The last step of this round is for us to compare our answers.*

T *I got* $\frac{3}{27}$ *and you had* $1\frac{2}{8}$ *or* $1\frac{1}{4}$*, since yours is a mixed number and includes one whole and a part of another whole yours is greater than mine.*

T *However, if you did not have a clearly larger fraction we would then need to find like denominators between our two answers to determine which was larger.*

T *You guys win and earn one point!*

T *Does anyone have any questions before we play?* Call on any students that have questions.

Perform a second practice round if the majority of the class seems confused. If there is just a small amount of students that are confused pull a small group to practice a second round.

T *Ok, those of you who feel ready, you are free to begin!*

T *Remember it is ok to help each other if you are stuck and please be a good sport by congratulating your partner if they win a round.*

T *This game is pure luck, so it all depends on the cards you draw!*

T *Let the games begin!*

Let students play until you run out of time. If you notice students struggling or getting off task pull them and play as a small group with them.

Team 1 (Students):

Step 1

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

Step 2

$$\frac{1}{2 \times 4 = 8} + \frac{3}{4 \times 2 = 8}$$

Step 3

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

Step 4

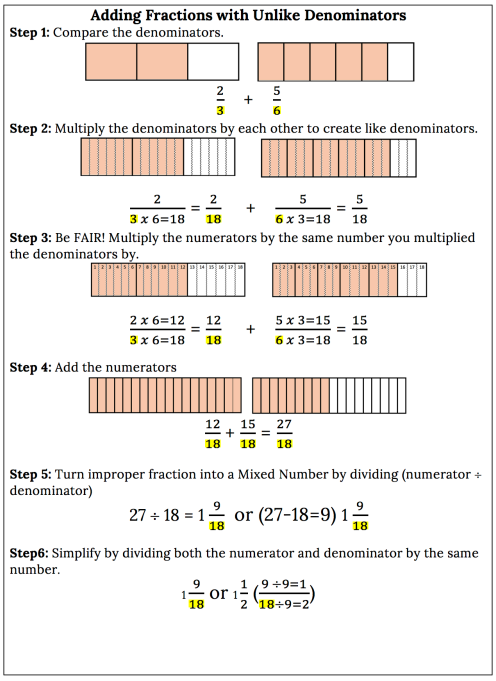
$$\frac{4}{8} + \frac{6}{8} = \frac{10}{8}$$

Step 5

$$\frac{10}{8}\ 10 \div 8 = 1\frac{2}{8}$$

OPTIONAL: Step 6

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



Name: _____Date: _____

Exit Slip: Segment 1

Adding and Subtracting Fractions with unlike denominators.

Directions: Add or subtract each showing all steps. Illustrate at least 2 of the 4 problems using a bar model.

1.) $\frac{2}{4} - \frac{1}{3}$	**2.)** $\frac{3}{6} + \frac{3}{4}$
3.) $\frac{2}{8} + \frac{1}{2}$	**4.)** $\frac{7}{8} - \frac{1}{3}$

Name: _____Date: _____

Exit Slip: Segment 2

Adding and Subtracting Mixed Numbers with Unlike Denominators.

Directions: Add or subtract each showing all steps. Choose either solution option 1 or 2 to solve.

1. Billy is riding his bike to school with his friend, Steve. Steve lives $1\frac{1}{2}$ miles from Billy. School is $2\frac{3}{4}$ miles from Steve's house. How many miles will Billy ride his bike in order to arrive at school?

2. Rita is painting book marks. She decided to use 2 different colors. The art supply store sells their paints by the ounce. Rita knows she will need $6\frac{4}{8}$ ounces of paint altogether. She wants her book marks to be mostly orange with accents of yellow. If she uses $5\frac{1}{3}$ ounces of orange, how much yellow paint will she need?

$\frac{1}{2}$	$\frac{2}{2}$	$\frac{1}{3}$
$\frac{2}{3}$	$\frac{3}{3}$	$\frac{1}{4}$
$\frac{2}{4}$	$\frac{3}{4}$	$\frac{4}{4}$
$\frac{1}{5}$	$\frac{2}{5}$	$\frac{3}{5}$

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

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

ADD	SUBTRACT	ADD
SUBTRACT	ADD	SUBTRACT
ADD	SUBTRACT	ADD
SUBTRACT	ADD	SUBTRACT

Make sure to "Break Up Your Day!"

These can be used in the middle of a lesson or at the end of your lesson.
Here are a few engaging movement and brain break ideas to get your students moving and ready to refocus!

Break Up Your Day: Math Outside!

- Students take a scratch paper and pencil and find fractions outside.
- Students draw and label the fractions they find (¼ of a four-square court, ⅛ steps on the slide, etc.)

Break Up Your Day: Buddy, Buddy!

FORMATION: Partners
EQUIPMENT: Paper
RULES/DIRECTIONS:

- Have partners ball up a piece of paper and place it on the floor.
- Ask the partners to pick up the paper using the body parts called out by the teacher: Elbow and elbow, Foot and foot, Knee and knee, Forearm and elbow, Foot and elbow, Knee and elbow, Forehead and back of hand, Toe and finger
- Students can place the paper ball back on their desks, or move it to other parts of the room.

Break Up Your Day: Fractions in Your Family!

- Students discuss with a shoulder buddy what part of a fraction they represent in their immediate family (1 out of 4 people would be ¼ of the family).
- Have them extend their family to include grandparents (1 out of 8 people would be ⅛ of the family).
- Have them extend again to count aunts, uncles, cousins, etc.
- Compare their findings with their shoulder buddy and see if they have the same "Fraction Family!"