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GRADE 4

Unit

3

Teacher Adaptation Pack

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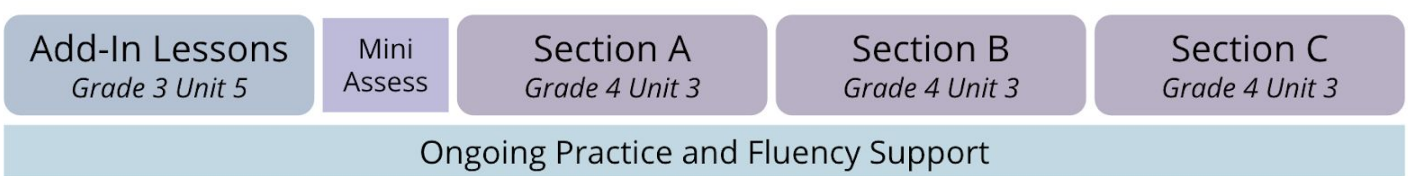
K5_Beta

Grade 4 Unit 3 Teacher Adaptation Pack

Directions for Use

1. Read the current grade level unit standards and dependencies.
2. Ask prior grade level teachers if students were taught the topics when school was in physical session last year. Another option is to show the students a problem on the topic and anonymously ask students if they know how to solve the problem.
    a. If yes, start the current grade level section without the add-in lessons.
    b. If not, teach the prior grade level add-in lessons.
3. After the add-in lessons, give the mini-assessment.
    a. If students got the questions correct, start the current grade level section.
    b. If students got some things correct, start the current grade level section, but use the ongoing practice materials to support students.

Recommended Implementation



Grade 4 Unit 3: Fraction Operations	
	Sections A, B, and C
Standards	• 4.NF.B.3, 4.NF.B.4, 4.NF.C.5, 4.NF.A.1, 4.NF.A.2
Prior-Grade Connections	• 3.NF.A.1, 3.NF.A.2, 3.NF.A.3
Rationale	In 4.3, students deepen their understanding of how fractions are composed, and how they can be decomposed, as they learn about fraction operations. This relies on Grade 3 knowledge that whole numbers and fractions are composed of unit fractions. Section A, students extend their earlier understanding of multiplication to include equal groups of fractional pieces. They begin by reasoning about groups containing unit fractions and move to groups of non-unit fractions. In Section B, students decompose a fraction into sums of smaller fractions with the same denominator to add and subtract fractions and mixed numbers. In Section C, students apply their understanding of fraction equivalence to add tenths and hundredths.
Add-in Lessons	Before Section A: • 3.5 Lesson 4
4.3 Lessons to Combine or Skip	Skip: • Optional Lesson 17
Prior-grade Practice and Fluency	• Number Line Scoot: Grade 3 Unit 8 Lesson 4 Activity 1 • Fraction Concentration: Grade 3 Unit 8 Lesson 4 Activity 2
Extension and Exploration	• IM Task: Snow Day
Assessment	Mini-Assessment If students need Ongoing Practice • Fraction Concentration: Grade 3 Unit 8 Lesson 4 Activity 2

Table of Contents

3.5 Lesson 4: Build Fractions from Unit Fractions

Teacher-facing Learning Goals

- Understand a fraction $\frac{a}{b}$ as the quantity formed by *a* parts of size $\frac{1}{b}$.
- Understand *b* number of parts the size $\frac{1}{b}$ represent 1.

Addressing CCSS: 3.NF.A.1

Lesson Purpose

The purpose of this lesson is for students to use pattern blocks to build non-unit fractions from unit fractions.

Materials Needed

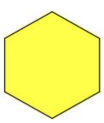
Gather

- pattern blocks (at least 3 hexagons, trapezoids, and rhombuses, and 8 triangles for each group of 2 students)

Copy

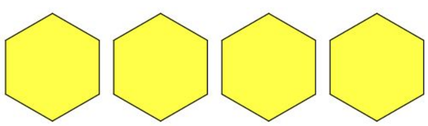
- none

Cool-down: Choose a Shape

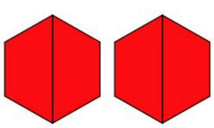


represents 1 whole. Which shape shows $\frac{4}{6}$?

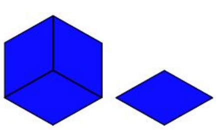
a.



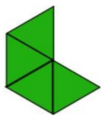
b.



c.



d.



Student Responses
d

Teacher Reflection Question
How did having physical manipulatives help students think about building fractions from unit fractions in today's lesson?

Access for Students with Disabilities	**Access for English Learners**
Activity 2: Engagement	Activity 2: MLR7 Compare and Connect

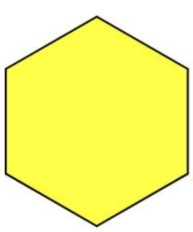
Warm-up Narrative: Notice and Wonder: Two Hexagons

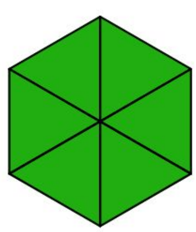
Addressing CCSS: 3.NF.A.1

The purpose of this warm-up is to elicit the idea that we can fill a whole with unit fractions, which will be useful when students use unit fractions in a later activity. While students may notice and wonder many things about these images, how to identify the unit fraction and write 1 as a fraction by counting unit fractions are the important discussion points.

This prompt gives students opportunities to look for and make use of structure (MP7). The specific structure they might notice is that 6 one sixth pieces make 1 whole.

Task Statement
What do you notice? What do you wonder?





Student Responses
Students may notice:

- There are two hexagons.
- One hexagon is made up of triangles.
- One hexagon is green.
- One hexagon has parts.

Launch/Activity

- Groups of 2
- Display the image.
- "What do you notice? What do you wonder?"
- 1 minute: quiet think time
- 1 minute: partner discussion
- Share and record responses.

Synthesis

- "What fraction could you write to represent the hexagon on the right?" (I could use 6 one sixth pieces. Using what we learned in a previous lesson, we could

- The second hexagon shows 6 one sixths.

Students may wonder:

- Why is the right hexagon green?
- Why would I make a hexagon out of triangles?
- What else could we make a hexagon out of?

write that as the number $\frac{6}{6}$.)

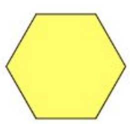
- “So if we think about the hexagon partitioned into sixths, it looks like we shaded or filled the entire hexagon with sixths. We can still count the number of unit fractions, each $\frac{1}{6}$, but instead of ending up with 4 sixths or 5 sixths, we had 6 sixths.”

Activity 1 Narrative: Pattern Block Fraction Puzzles

Addressing CCSS: 3.NF.A.1

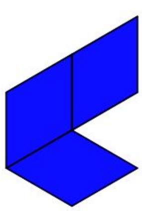
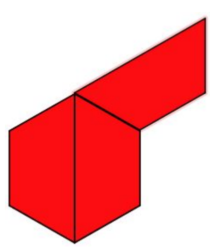
The purpose of this activity is for students to compose non-unit fractions from unit fractions. Students use what they know about the whole to determine the size of each piece, then determine the number of copies of the unit fraction to compose each non-unit fraction. Students use pattern blocks to create their own fraction puzzles and challenge their partners to figure out what fraction the composite shape represents.

Task Statement



represents 1 whole

1. Here are some shapes built from pattern blocks. What fraction does each shape represent?

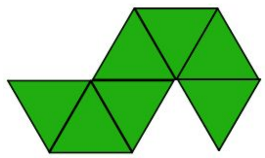
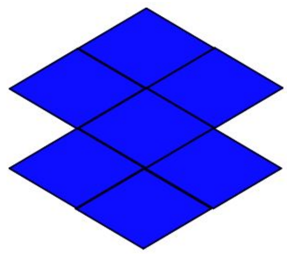
 _____ copies of ______ Fraction:	 _____ copies of ______ Fraction:

Launch/Activity

- Groups of 2
- “If the hexagon is 1 whole, how is each shape built from unit fractions? You’ll fill that in the ___ copies of ___ line. Then, decide what fraction each shape represents."
- 1 minute: quiet think time
- 3-5 minutes: partner work time
- Share and record responses.
- “Now, you’re going to create your own pattern block puzzles using copies of $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{6}$. After you build your shape, challenge your partner to figure out what fraction you built. Take turns being the builder and the solver.”
- 3-5 minutes: partner work

Synthesis

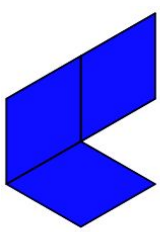
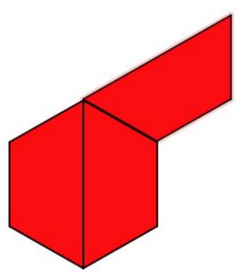
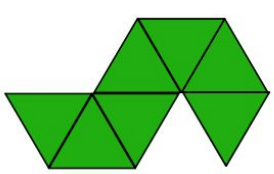
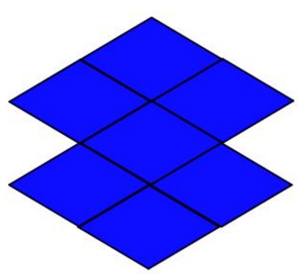
- Have students share shapes they created

 _____ copies of ______ Fraction:	 _____ copies of ______ Fraction:

2. Build a shape using only copies of $\frac{1}{2}$, copies of $\frac{1}{3}$, or copies of $\frac{1}{6}$. Challenge your partner to figure out what fraction you built. (The hexagon is still 1 whole.)

Student Responses

1.

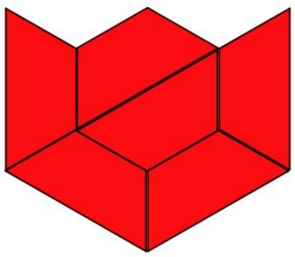
 3 copies of $\frac{1}{3}$ Fraction: $\frac{3}{3}$	 3 copies of $\frac{1}{2}$ Fraction: $\frac{3}{2}$
 7 copies of $\frac{1}{6}$ Fraction: $\frac{7}{6}$	 7 copies of $\frac{1}{3}$

and have the class discuss what fraction each shape represents.

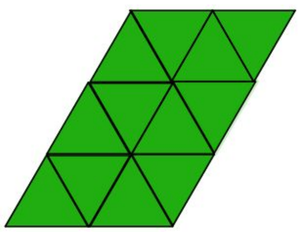
- Ask: "How did you know that this shape represents ____?"

	Fraction: $\frac{7}{3}$

2. Sample responses:



$\frac{6}{2}$



$\frac{12}{6}$

Activity 2 Narrative: Build Shapes From Units

Addressing CCSS: 3.NF.A.1

The purpose of this activity is for students to build fractions when given the whole. Students use what they know about how to partition a whole into equal parts, then use unit fractions to compose the given fractions. Students also consider which fractions could be used to compose a new whole, and how they know which fractions could compose a new whole and which fractions couldn't.

SwD Support Tags
- Engagement

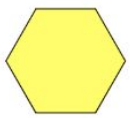
MLR Tags
- MLR7 Compare and Connect

EL Support Text
*MLR7 Compare and Connect.*Synthesis: After all strategies have been presented, lead a discussion comparing, contrasting, and connecting the different approaches. Ask,"What did the shapes have in common?", "How were they different?","Why did the different approaches lead to the same outcome?"
Advances: Representing, Conversing

SwD Support Text

Engagement: Develop Effort and Persistence. Activity: Chunk this task into more manageable parts. Check in with students to provide feedback and encouragement after each chunk.
Supports accessibility for: Organization, Attention

Task Statement

 represents 1 whole

1. Build a shape to represent each fraction. Compare with your partner.
   a. $\frac{2}{3}$
   b. $\frac{4}{3}$
   c. $\frac{6}{3}$
2. In shapes a, b, and c, which ones could be rearranged to make a new hexagon(s)? Why?
3. Use the appropriate pattern block to build the following fractions when the hexagon is 1 whole.
   a. $\frac{3}{6}$
   b. $\frac{8}{6}$
   c. $\frac{5}{2}$
   d. $\frac{8}{2}$
4. In shapes a, b, and c, which one can be rearranged to make a new hexagon(s)? Why?

Student Responses

1. Shapes vary.
2. $\frac{6}{3}$ can make 2 hexagons because there are three thirds in every 1 whole. B can make one new hexagon with a leftover piece.
3. Shapes vary. Students should use the green triangle to build a and b shapes. Students

Launch

- Groups of 2
- "In this activity, the hexagon represents 1 whole. What fraction would the blue rhombus represent?"
- 30 seconds: partner discussion
- Share responses and record and display $\frac{1}{3}$ for students to refer to during the activity.
- "Using that unit, you are going to build a shape to represent the given fractions."

Activity

- 10 minutes: partner work time

Synthesis

- Ask students to share a few shapes for problem 1 and explain how they knew it represented the fraction. Highlight responses that focus on the number of pieces and the size of each piece being the unit fraction.
- "How did you know the unit fraction to use for problem 3?"
- "Did anyone use one shape to build another shape for any of the problems?" (yes, I just added 5 more pieces to my shape when it changed from $\frac{3}{6}$ to $\frac{8}{6}$. I just doubled my shape when it changed from $\frac{2}{3}$ to $\frac{4}{3}$ because it was just 2 more pieces the size of $\frac{1}{3}$.)
- How did you know which fractions could make a new hexagon and which ones could not?

should use the trapezoid to build c and d shapes.

4. B could make 1 whole new hexagon with 2 pieces left over, c could make 2 hexagons with 1 piece left over, d could make 4 new hexagons.

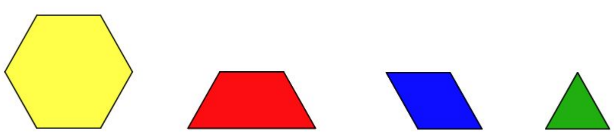
Activity 3 Narrative: Change the Whole (Optional)

Addressing CCSS: 3.NF.A.1

The purpose of this optional activity is for students to see how fractions are built from unit fractions. They consider different pattern blocks to be the whole and think about what fraction of that whole the other blocks represent. Students should be encouraged to use what they know about unit fractions to justify their answers and expand upon the idea fostered in a previous lesson that we can count the number of unit fractions to make a non-unit fraction.

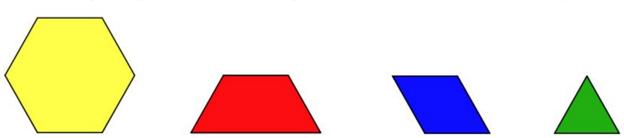
Task Statement

1. The red trapezoid is 1 whole. Label the other blocks with the correct fraction. Be prepared to explain your reasoning.



1 whole

2. The blue rhombus is 1 whole. Label the other blocks with the correct fraction. Be prepared to explain your reasoning.



1 whole

Student Responses

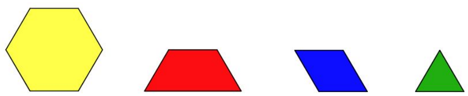
Launch/Activity

- Groups of 2
- Give students pattern blocks.
- "Take a few minutes to think about these problems."
- 3 minutes: independent work time
- "Share your reasoning with your partner and work together to justify your decisions using your pattern blocks. Be prepared to share your reasoning."
- 5-7 minutes: partner work time
- Monitor for students who use what they know about counting unit fractions to justify their answers.

Synthesis

- Display the pattern block image or display one of each physical block for all students to see.
- Have students share their reasoning and demonstrate with their pattern blocks for each problem.
- As students share, record the fractions for each block. Be sure to clearly label the

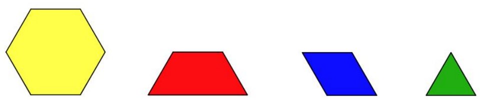
1.



$\frac{6}{3}$ (2 wholes) 1 whole or $\frac{3}{3}$ $\frac{2}{3}$

$\frac{1}{3}$

2.



$\frac{6}{2}$ (3 wholes) $\frac{3}{2}$ 1 whole or $\frac{2}{2}$

$\frac{1}{2}$

whole for the problem being discussed.

- Consider asking:
    - “How did you use unit fractions to decide the correct fraction for each block?” (The triangle is $\frac{1}{3}$ of the trapezoid because it takes 3 triangles to make the trapezoid, so the rhombus is $\frac{2}{3}$ of the trapezoid because it takes 2 triangles to make the rhombus.)
    - “Does anyone want to add on to ___ 's reasoning?”
- “Let’s focus on the hexagon for a minute. When we worked with pattern blocks in a previous lesson we said the hexagon was the whole. What happens to the hexagon here when we make the trapezoid the whole?” (The hexagon is bigger than one whole. We can see that 2 trapezoids make 1 hexagon, so that means that 6 triangles make the hexagon. That’s 6 one-thirds, and we can write $\frac{6}{3}$.)
- 2 minutes: partner discussion
- Share and record responses.
- “What do you notice about the fractions we wrote for the blocks that were bigger than the whole?” (The bottom of the fraction stayed the same as the fractions for the other blocks. It was the number of unit fractions in the whole. The top part of the fraction is bigger than the bottom part of the fraction.)
- 2 minutes: partner discussion
- Share and record responses.
- “So we noticed that we can write the whole as $\frac{3}{3}$ or $\frac{2}{2}$ depending on the unit fraction we were using, $\frac{1}{3}$ or $\frac{1}{2}$. So that means

	when a fraction gets bigger than 1 whole, the top part is bigger than the bottom part, like $\frac{6}{3}$."

Lesson Synthesis
Display the following fractions:

$$\frac{5}{8} \qquad \frac{4}{8}$$

"Based on our activities today, what do we know is the same about these two fractions? What is different?" (We know they have the same sized piece as the unit fraction, $\frac{1}{8}$, but one fraction has one more part.)
Record and display responses.

Display the following fractions:

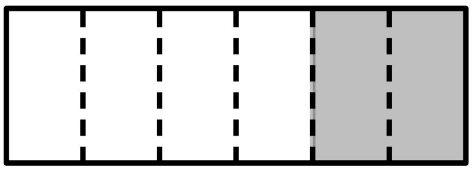
$$\frac{2}{3} \qquad \frac{4}{3}$$

If the hexagon represents 1 whole, could we build a whole hexagon with the following fractions. (Not with $\frac{2}{3}$ because we need 3 thirds to make 1 whole. We can with $\frac{4}{3}$ because we would have $\frac{3}{3}$ and 1 extra third.
2 minutes: partner discussion
Share responses.

Mini-Assessment

Student Facing Task Statement

What fraction of the large rectangle is shaded? Select **all** that apply.



A. $\frac{1}{6}$

B. $\frac{1}{5}$

C. $\frac{2}{6}$

D. $\frac{1}{3}$

E. $\frac{4}{6}$

Student Responses
C, D

Prior-grade Practice and Fluency

Number Line Scoot

Addressing CCSS: 3.NF.A.2

20 min — The purpose of this activity is for students to practice representing fractions on the number line.

Task Statement

Use the directions to play Number Line Scoot.

1. Each player places a small cube or counter on zero on every number line.
2. Players take turns.
3. Roll a number cube.
4. Place the number you rolled in the numerator of one of the given fractions for roll 1 on the recording sheet.
5. Count aloud as you move a counter that distance on the appropriate number line.
6. Each time a counter lands exactly on the last tick mark of one of the number lines, keep that counter. Put a new one at 0.
7. The player with the most counters after 20 rolls wins.

roll 1	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 11	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$
roll 2	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 12	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$
roll 3	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 13	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$
roll 4	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 14	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$
roll 5	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 15	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$
roll 6	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 16	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$
roll 7	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 17	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$
roll 8	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 18	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$

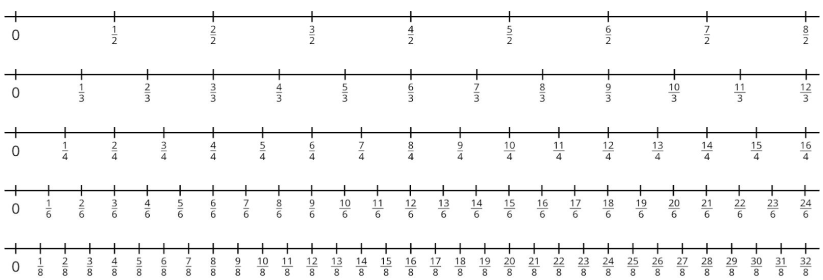
Launch/Activity

- Groups of 2
- “Take a minute to read over the directions for Number Line Scoot.”
- 1 minute: quiet think time
- “Play Number Line Scoot with your partner.”
- 10–15 minutes: partner game time

Synthesis

- “What strategies were helpful as you played Number Line Scoot?” (I tried to use the smallest denominator I could because it made the largest move. Once I was close to the last mark I had to wait for the number I needed to land right on the last mark.)

roll 9	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 19	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$
roll 10	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$	roll 20	$\frac{\square}{2}$	$\frac{\square}{3}$	$\frac{\square}{4}$	$\frac{\square}{6}$	$\frac{\square}{8}$



Student Responses

Responses will vary.

Fraction Concentration

Addressing CCSS: 3.NF.A.1 and 3.NF.A.2

15 min — The purpose of this activity is for students to practice representing fractions with area diagrams, fraction strips, and number lines.

Task Statement

Use the directions to play Fraction Concentration.

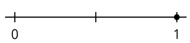
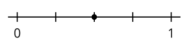
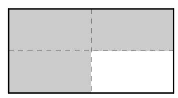
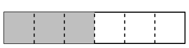
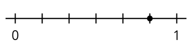
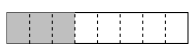
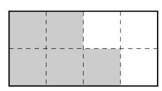
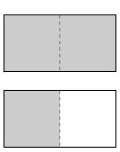
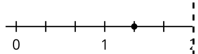
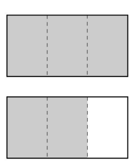
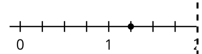
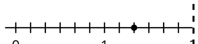
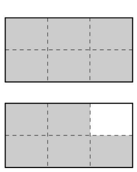
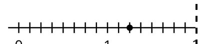
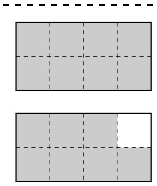
1. Shuffle the cards.
2. Place the cards upside down in 4 rows with 8 cards in each row.
3. Choose two cards. If the two cards are a match, explain how they match to your partner and keep the pair. You get to go again (no more than 2 turns).
4. If the cards aren't a match, place them back where they were.
5. The player who collects the most pairs wins.

Launch/Activity

- Groups of 2
- "Take a minute to read over the directions for Expression Concentration."
- 1 minute: quiet think time
- Give each group of 2 students a set of cards.
- "Play Expression Concentration with your partner."
- 10–15 minutes: partner game time

Synthesis

- "What strategies were helpful as you played Expression

$\frac{2}{2}$	$\frac{2}{3}$	$\frac{2}{4}$	$\frac{3}{4}$
			
$\frac{3}{6}$	$\frac{5}{6}$	$\frac{3}{8}$	$\frac{5}{8}$
			
$\frac{3}{2}$	$\frac{4}{3}$	$\frac{5}{3}$	$\frac{5}{4}$
			
$\frac{8}{6}$	$\frac{11}{6}$	$\frac{10}{8}$	$\frac{15}{8}$
			

Concentration?" (I thought about how the whole had been partitioned so I could match the fraction with the right diagram. I thought about how many parts had been shaded. I thought about what point was marked on the number line. I tried to remember where a fraction was, so when I saw the right diagram I could match them up.)

Student Responses Responses will vary.	
Lesson Synthesis “Today you played fraction games. What were some of the big ideas about fractions that you used as you played the games?” (The bottom part of the fraction tells you how the whole was partitioned. The numerator tells you how many of the equal parts there are. When you represent a fraction on the number line, the denominator tells you how many lengths to partition the whole into, not how many marks there should be.) 2 minutes: partner discussion Share responses.	

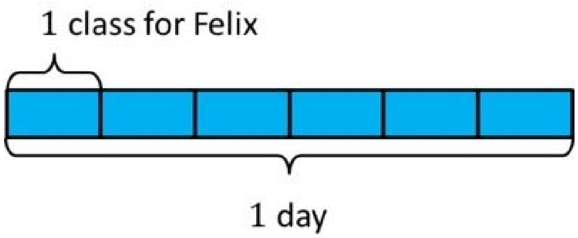
Extension and Exploration

IM Task: Snow Day
Alec and Felix are brothers who go to different schools. The school day is just as long at Felix' school as at Alec's school. At Felix' school, there are 6 class periods of the same length each day. Alec's day is broken into 3 class periods of equal length. One day, it snowed a lot so both of their schools started late. Felix only had four classes and Alec only had two. Alec claims his school day was shorter than Felix' was because he had only two classes on that day. Is he right?
IM Commentary: The purpose of this task is for students to investigate a claim about a comparison of two fractions in a context. Many fraction problems are set in food contexts or a situation where a physical thing is being shared. It is important for students to work on more abstract quantities like time as well. This particular task helps to illustrate Mathematical Practice Standard 3, Construct viable arguments and critique the reasoning of others. Students are asked to critique the reasoning of Alec's claim that his school day was shorter than his brother's. This type of task provides students with an opportunity to distinguish a reasonable explanation from that which is flawed. If there is a flaw in the argument they can further explain why it is flawed. Students will need to determine what information is necessary to calculate in order to support or dispute the claim. To distinguish if Alec's claim is true or false, students will have to uncover the fractional part of the day Alec and Felix were at school and not just

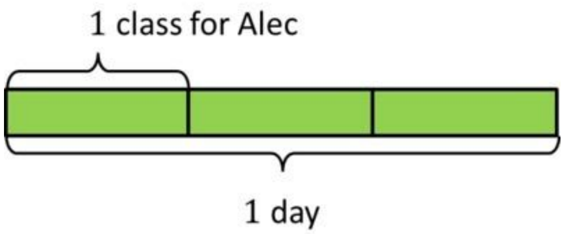
rely on the number of classes they each attended. Learning how to argue whether a claim is true or false concisely and precisely becomes a routine part of a student's mathematical work.

Solution:

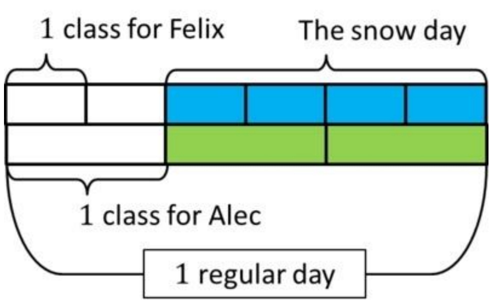
Felix has six equal class periods each day. So each class period lasts for $\frac{1}{6}$ of the day.



Alec has three equal class periods each day. So each class period lasts for $\frac{1}{3}$ of the day.



Felix only had 4 class periods, so he went to school for $\frac{4}{6}$ of a full day. Alec only had 2 class periods, so he went to school for $\frac{2}{3}$ of a full day.



But a full day is equal for the two brothers, so two of Felix' class periods are the same length as one of Alec's. The brothers actually went to school for the same amount of time on the snow day.