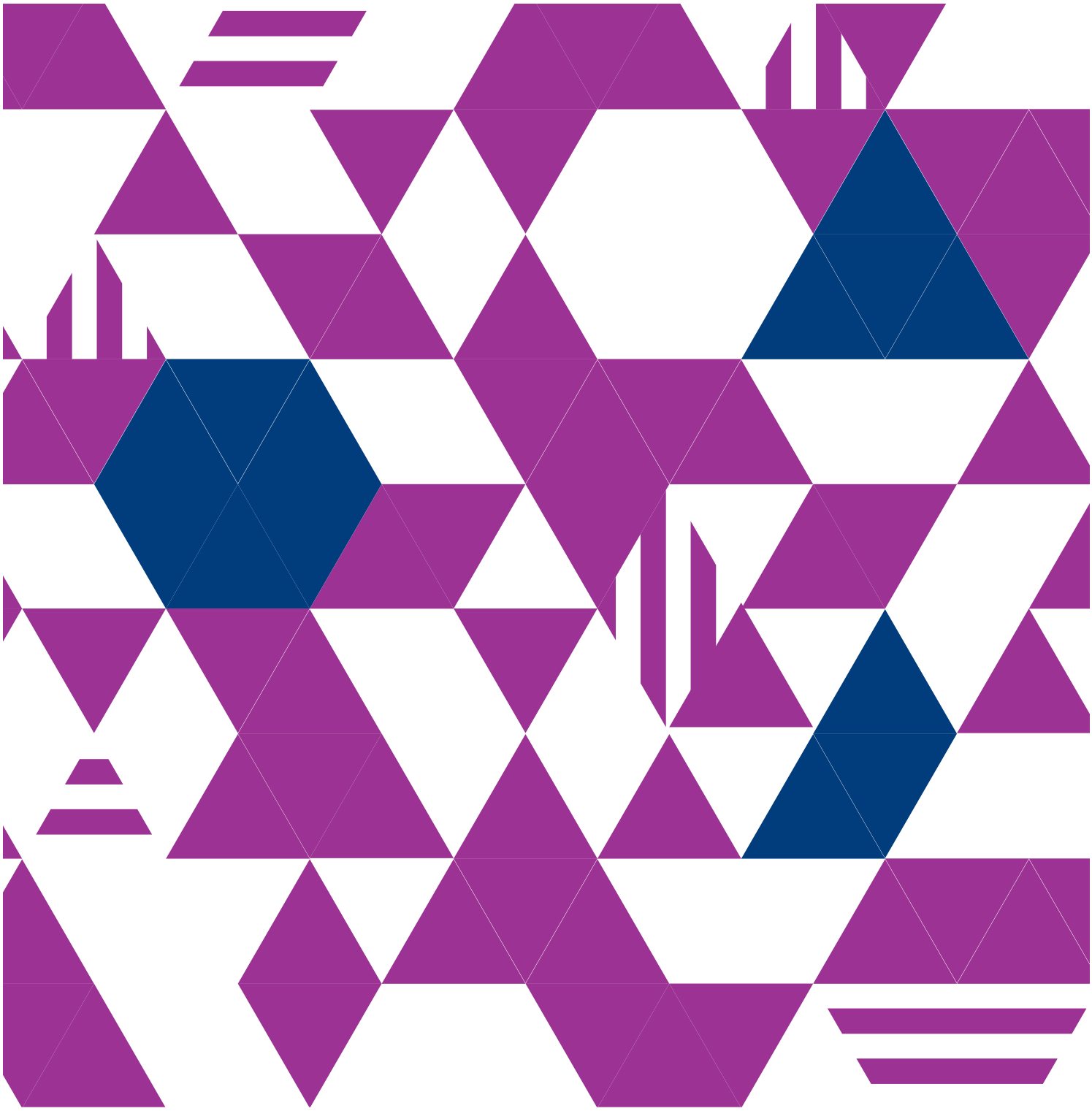


bridges® in mathematics

SAMPLE

Grade 4

Unit 3 Module 1 Session 6

Session 6

Name That Fraction

Summary

After using the 12-egg carton model to show that two fractions are equivalent, students find some of the other equivalent fractions that can be represented with the egg carton materials. They then expand and generalize the egg carton visual model to represent fractions with denominators of 10 and 18. At the end of the session, the teacher introduces and assigns the Thinking About Fractions Home Connection.

Module 1 Learning Goals

Students learn about equivalent fractions using various representations.

- ☐ Students reason about magnitude to place fractions on a number line.
- ☐ Students explore different representations of ¾ using their understanding of division.
- ☐ Students investigate equivalent fractions by constructing and analyzing fraction strips.
- ☐ Students investigate equivalent fractions by constructing and analyzing egg-carton diagrams.
- ■ **Students justify conclusions about equivalent fractions using their choice of representation.**

Materials

Problems & Investigations Name That Fraction	
Copies & Display	**PO P10** Twelve-Egg Carton **PO P11** Eighteen-Egg Carton **SB 98–99** Equivalent Fractions **SB 100** How Many in the Whole Group? (optional)
Kit Materials	• Word Resource Cards for *denominator, equivalent fractions,* and *numerator* • colored tiles (18 per student)
Classroom Materials	• 10-inch lengths of yarn, heavy cotton string, or chenille stems (6 per student) • student math journals • students' fraction strips (from Session 4) • crayons or colored pencils (at least 3 colors per student, class set)
Home Connection	
Copies & Display	**HC 53–54** Thinking About Fractions
Daily Practice	
Copies & Display	**SB 101** More Egg Carton Fractions

PO – Print Original, **SB** – Student Book, **HC** – Home Connections

Vocabulary

**Word Resource Card available*

denominator*
equal parts
equivalent fractions*
fraction*
numerator*
sixths
thirds
twelfths
whole

Preparation

Consider laminating the class set of the Twelve-Egg Carton and Eighteen-Egg Carton print originals or placing them in sheet protectors for students to mark on using dry-erase markers.

Problems & Investigations

Name That Fraction

What Are Equivalent Fractions?

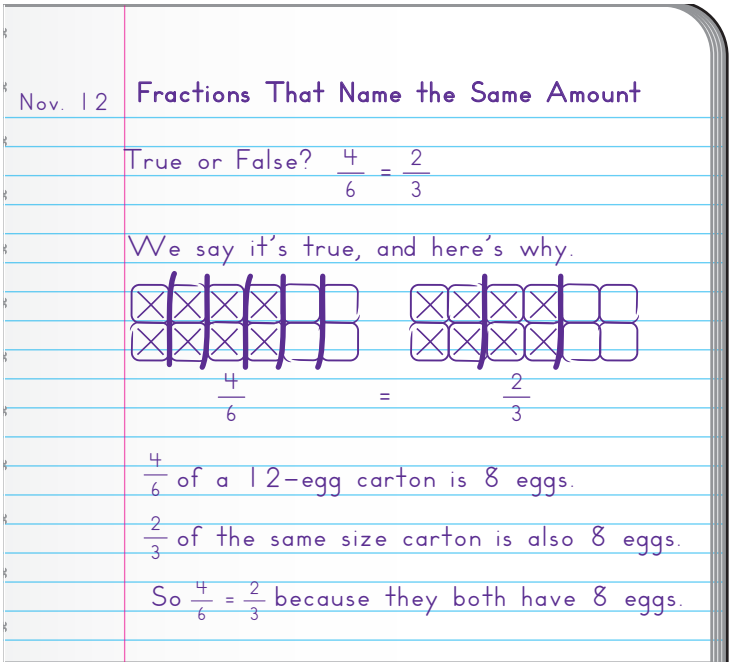
1 Let students know that they're going to use the egg carton model to investigate fractions that name the same amount.

- Give each student a copy of the Twelve-Egg Carton print original; yarn, string, or chenille stems; and at least 18 colored tiles.
- Have students open their math journals to the next available page. Ask them to write the date and "What Are Equivalent Fractions?" at the top.

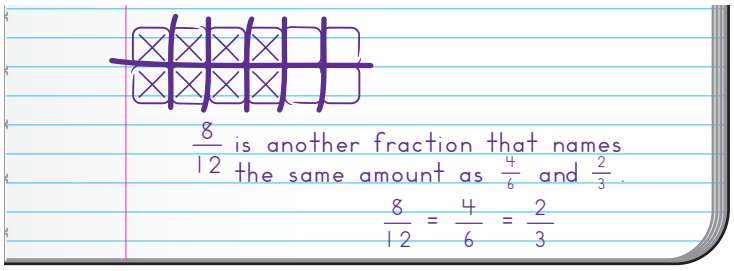
2 Write the equation 4/6 = 2/3 where everyone can see it. Ask students to show thumbs-up if they believe the equation is true, thumbs-down if they believe it is false, and thumbs-sideways if they're not sure.

3 Challenge student pairs to use their materials to decide whether the equation is true.

- Circulate and watch for students who are using the egg carton model and fraction strips interchangeably as they represent 2/3 and 4/6. If several students are doing this, stop and have a class discussion about comparing fractions representing a different whole. Remind students that the two models are not equivalent, because they do not represent the same whole.
- Once students feel they have reached a conclusion and chosen a representation, have them sketch their models in their journals and explain their reasoning.



4 Invite students to use the same materials to represent 8/12. Then have them write observations about that fraction to their journals.



5 When students have recorded their observations, reconvene the class to discuss their findings.

- Invite several pairs to share their conclusions and explain their reasoning.
- Tell students that fractions like ⅔, ⅘, and ⅘ are called *equivalent fractions*. Display the Word Resource Card for *equivalent fractions,* showing only the visual models. Ask students to think-pair-share the meaning of equivalent fractions. After several students have shared their definitions, generate a definition the class can agree upon and record it on the display.
- Spend a few minutes helping students deepen their understanding of equivalent fractions by asking these questions:
  - » *What does it mean when someone says that two fractions are equivalent?*
  - » *Name two fractions that are equivalent. How do you know they're equivalent?*
  - » *Would you rather have one-half of a sandwich or two-fourths of the same sandwich? Why?*
- Have students add the term *equivalent fractions*, the class definition, and two or three examples to the handbook at the back of their journals.

Naming Equivalent Fractions

6 Display the first page of Equivalent Fractions, and ask students to find the page in their student books.

- Read the instructions and look over the example with the class.
- As you look at the example, confirm with the class that ⅔, ⅓, and ⅘ are equivalent fractions. Ask several volunteers to show or explain how the models represent these three fractions, then ask them to explain how and why the fractions are equivalent to one another.
- When students understand what to do, ask them to complete both pages with a partner, but to fill out their own student book pages.
- Distribute copies of the Eighteen-Egg Carton print original, and encourage students to use the egg carton diagrams (hands-on exploration with the model will maximize the value of this activity). Also encourage them to share and compare their work with other pairs nearby.

CHALLENGE Encourage students who demonstrate a strong understanding of equivalent fractions to start with item 5 on the first page and complete through the challenge problem on the second page. You can also ask them to work on the optional How Many in the Whole Group? page in their student books, or assign it as homework in addition to, or in place of, the regular assignment.

Note

Keep copies of the Twelve-Egg Carton and Eighteen-Egg Carton pages (optionally laminated) and yarn, string, or chenille stems for use in future sessions.

Digital Resources

The models used in this unit (including egg cartons and geoboards) can be represented as grids with varying numbers of cells. Use the Number Frames app during class discussions to give students a way to share fraction models. The app can represent grids up to 12-by-12.

Apps are available at apps.mathlearningcenter.org.

Equity-Based Practice

Affirming mathematics learners' identities

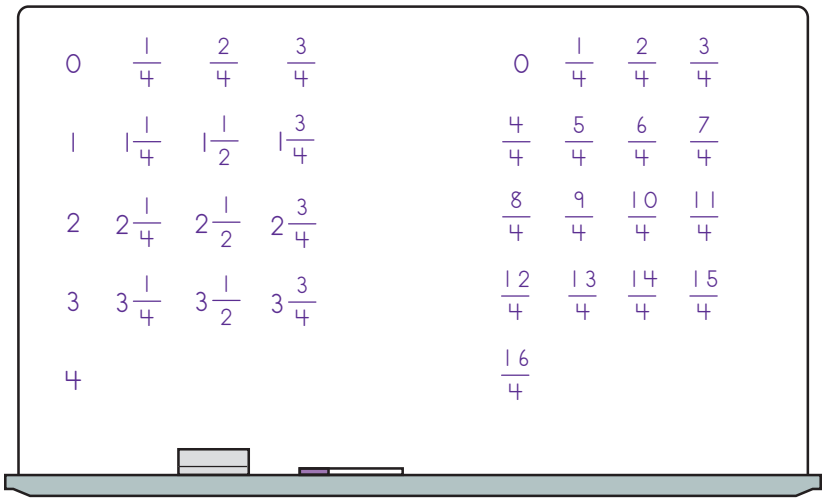
Learning to understand and represent equivalent fractions takes time. As they become familiar with common equivalencies, student might make counting mistakes. Circulate and encourage students to compare their representations, making sure that they represent the same amount. Affirm their mathematics learners' identities when they identify their own mistakes, and reinforce that finding mistakes is one of the best ways to learn.

Counting & Recognizing Equivalent Fractions

7 When there are about 10 minutes remaining in the session, have the class put away their student books. If possible, give students who haven't finished the assignment time to do so before the next session. The practice can help them prepare for the checkpoint on equivalent fractions.

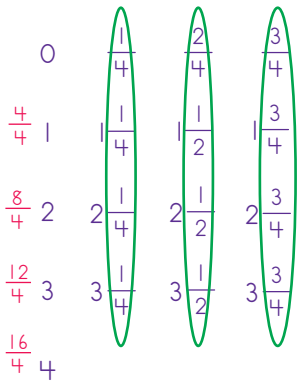
8 Engage the class in a choral counting activity. Tell them they will start at 0 and count in unison to 4 by fourths. You will record the count, then the class will discuss the patterns that emerge.

- Before beginning the count, either decide as a class or let students know whether they will count using improper fractions or mixed numbers. Either way, patterns will emerge that can be discussed. After the discussion, students can name equivalent fractions for the numbers in the list.
- As students count, record the numbers horizontally with four numbers in each row.
- If students count using improper fractions, pause about halfway through and ask how they will know when they get to a fraction equal to 4.



9 When the counting is complete, invite students to share what they notice about the numbers you recorded. What patterns do they see?

- Have students come up and point to the numbers on the whiteboard so others can more easily see and understand the observations as they're shared.
- You can loop the numbers and make other notations in different colors to highlight students' observations.



Mai *The fraction part is the same in each column. The first column always has a whole number without a fraction.*

Teacher *Why do you think that pattern happened?*

Mai *There are 4 fourths in every whole. So every time we got to the 4th fourth, we made another whole.*

Instructional Routine

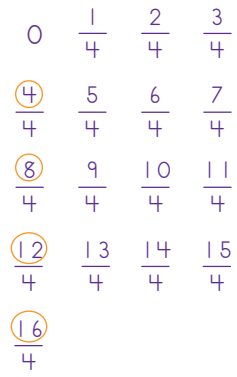
Choral counting

Choral counting provides practice with skip-counting and identifying patterns and structures in our number system. The activity develops across the grades by varying the number students are counting by, the start number for the counting, and the direction of the counting. Skip-counting fractions and decimals can reveal some interesting patterns that lead to greater fraction and decimal sense.

Digital Resources

The Number Chart app can be used for choral counting. The chart can be customized for the number of rows and columns needed for counting whole numbers, fractions, or decimals. Enter share code 270H-TKWA in the app for a number chart that can be used to count improper fractions for this choral counting activity.

Apps are available at apps.mathlearningcenter.org.



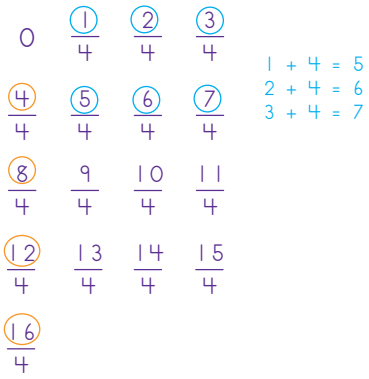
Domineek *I notice that there are multiples of 4 in the numerators of the fractions in the first column, except for 0.*

Teacher *Could we write 0 as a fraction?*

Domineek *Sure, it's zero-fourths. But 0 isn't a multiple of 4.*

Teacher *Let's think about our definition of* multiple. *Look back at what you recorded in your handbook for the definition of* multiple.

Domineek *Oh yeah, a multiple is the product of two whole numbers, so 0 is a multiple of 4, because 0 × 4 = 0!*



Jason *I noticed that each numerator is four more than the one above it. It's like that in all four columns.*

Teacher *Why do you think that happens?*

Jason *We have 4 fourths in each row, so it makes sense that each row would be ¼ more than the row above.*

10 When students have finished sharing, ask them whether there's another way to write some of the fractions in the list.

Progress through the list one fraction at a time. Students may not find all the equivalent fraction options. For now, record only those that they mention.

Home Connection

11 Introduce and assign the Thinking About Fractions Home Connection, which provides more practice with the following skills:

- Use a visual model to generate and recognize equivalent fractions
- Explain why one fraction must be greater than, less than, or the same as another fraction

Daily Practice

The optional More Egg Carton Fractions student book page provides additional opportunities to apply the following skills:

- Use a visual model to generate and recognize equivalent fractions

Print Originals

GRADE 4 – UNIT 3 – MODULE 1

Session 6

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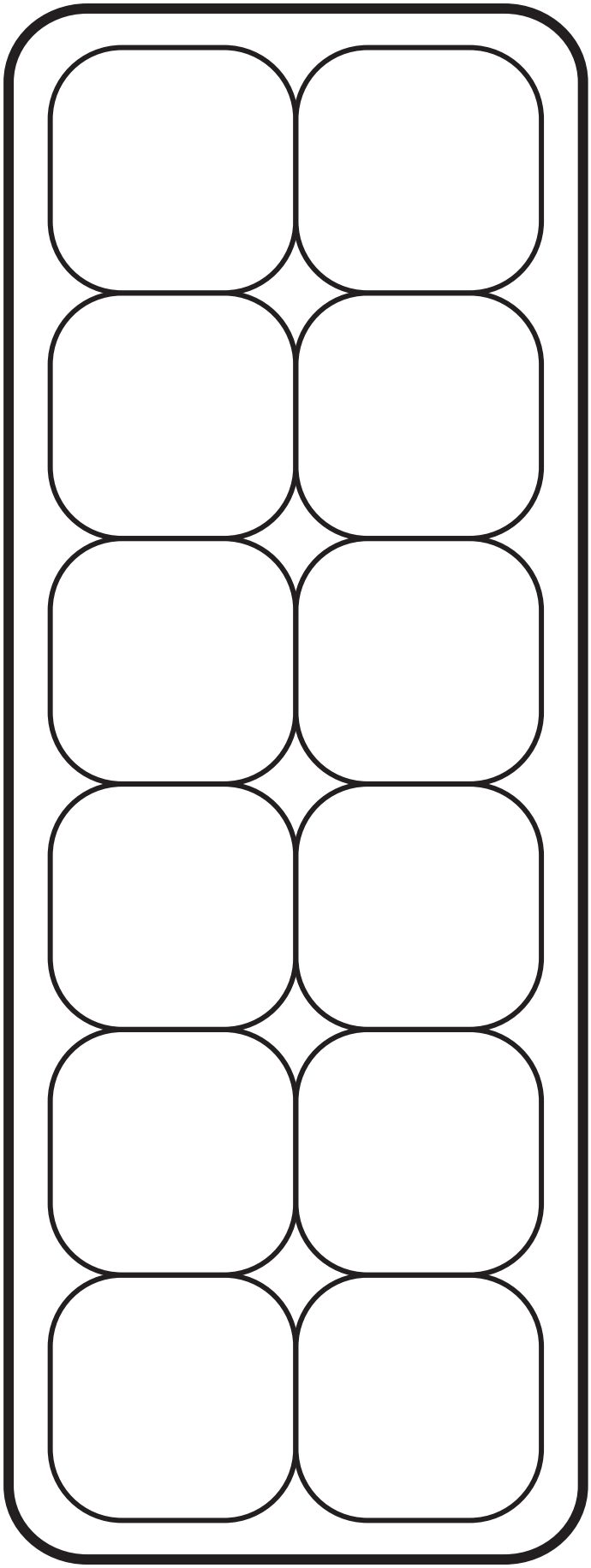
SAMPLE 0922

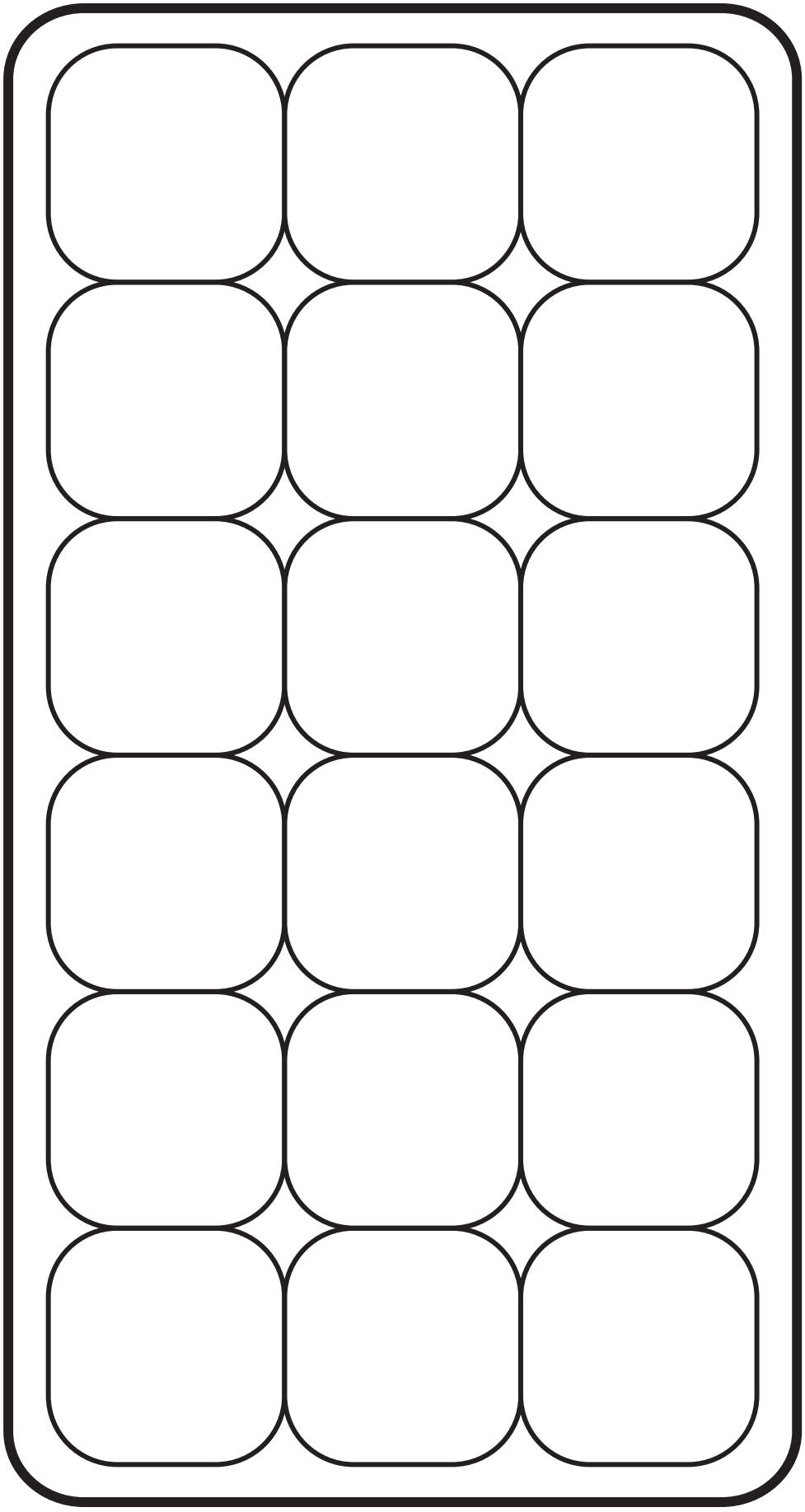
NAME | DATE

Twelve-Egg Carton



NAME | DATE

Eighteen-Egg Carton



Student Book

GRADE 4 – UNIT 3 – MODULE 1

Session 6

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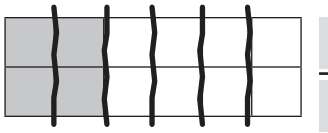
NAME | DATE

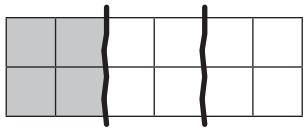
Equivalent Fractions page 1 of 2

In each problem, there are 2, 3, or 4 identical egg cartons. An egg carton is worth 1. Label each with a different fraction, and draw lines on the carton to show your thinking.

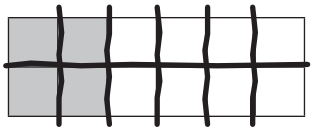
ex



$\frac{2}{6}$

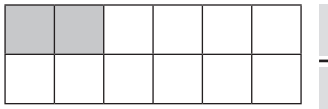


$\frac{1}{3}$



$\frac{4}{12}$

1



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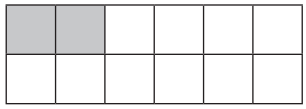

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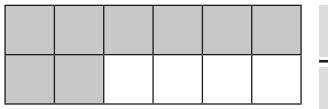

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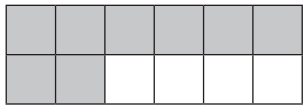

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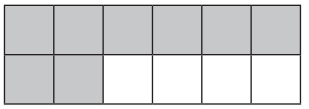

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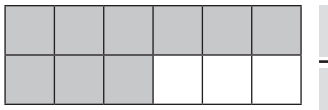

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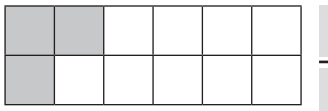

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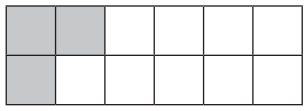

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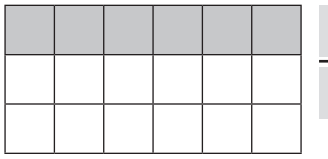

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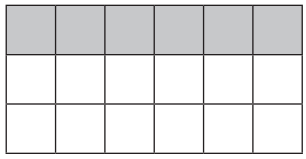

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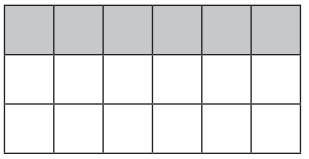

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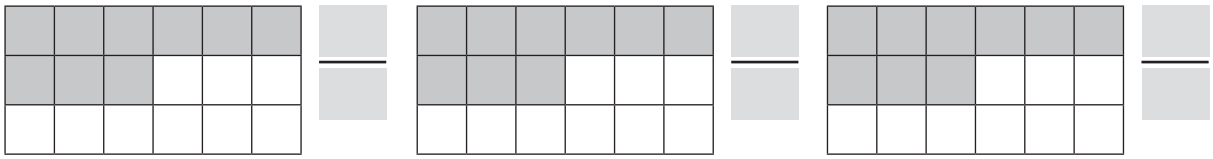
NAME | DATE

Equivalent Fractions page 2 of 2

7



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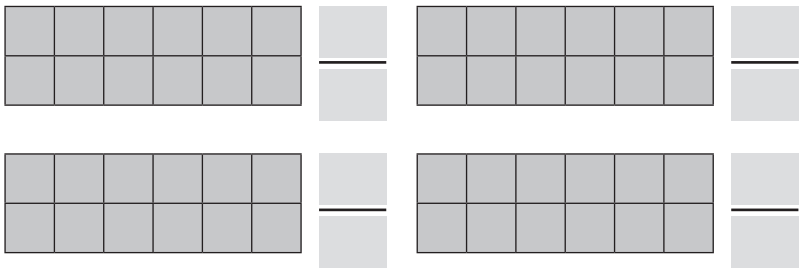
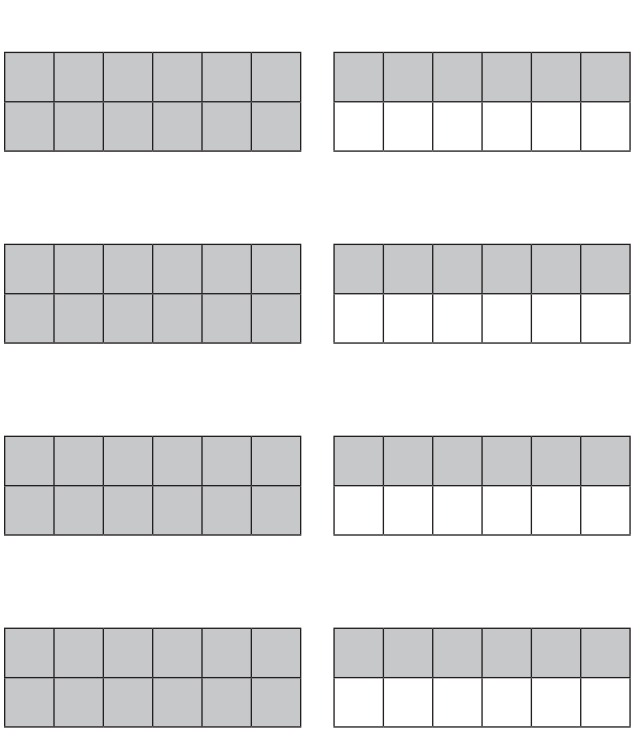


9 **CHALLENGE** Can you name a carton and a half of eggs four different ways? (Hint: Use mixed numbers or improper fractions.)



NAME | DATE

How Many in the Whole Group?

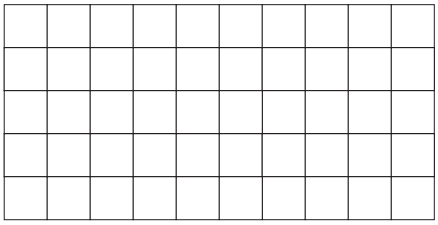
Use colored tiles and string to help you solve each puzzle. Make a sketch to show your thinking. Be sure to show the shapes and lines that divide the groups into equal parts.

1 ♡♡♡♡ represents $\frac{1}{4}$ of a group. How many hearts are in the whole group?

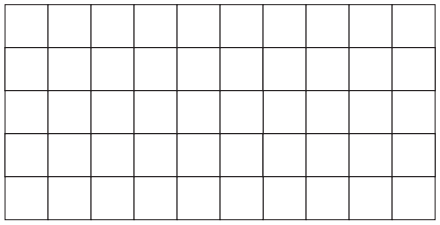
2 △△△△△△ represents $\frac{2}{3}$ of a group. How many triangles are in the whole group?

Make a sketch on the grid to represent each puzzle. Draw a carton and lines that divide the carton into equal parts. Show your thinking. (You might not use the entire grid.)

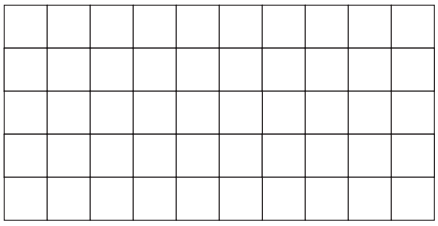
3 6 eggs fill $\frac{1}{5}$ of a carton. How many eggs are in the whole carton?



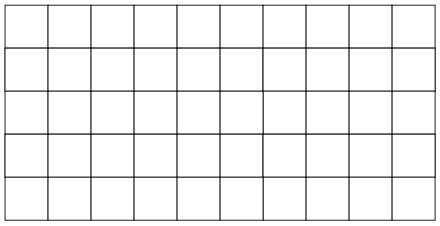
4 3 eggs fill $\frac{1}{8}$ of a carton. How many eggs are in the whole carton?



5 3 eggs fill $\frac{3}{4}$ of a carton. How many eggs are in the whole carton?



6 6 eggs fill $\frac{2}{5}$ of a carton. How many eggs are in the whole carton?

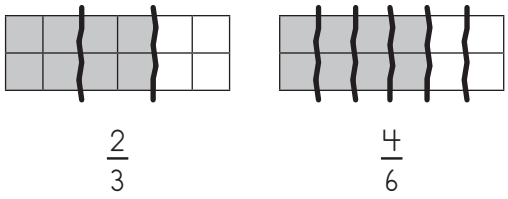


NAME | DATE

More Egg Carton Fractions

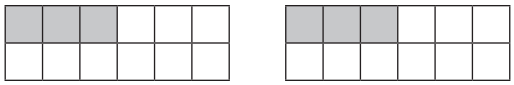
1 Write at least two fractions to show the part of each egg carton that is filled. Draw lines on the egg cartons to divide them into equal parts.

ex



$\frac{2}{3}$ $\frac{4}{6}$

a



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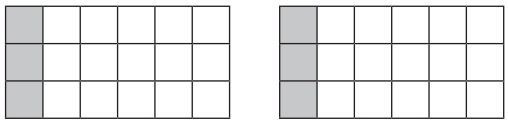

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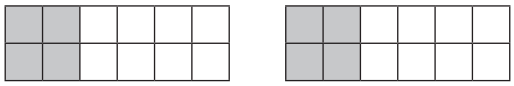

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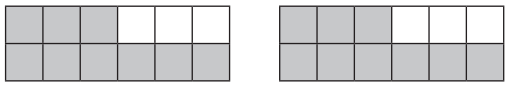
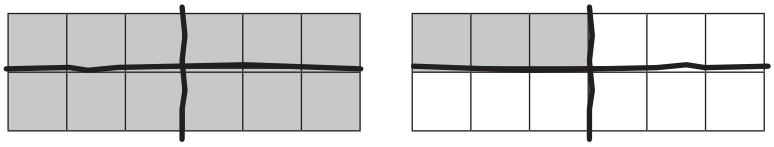
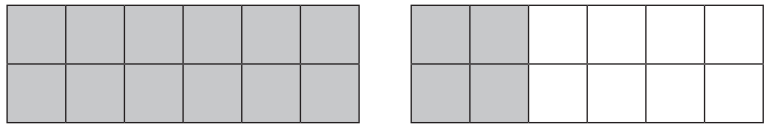
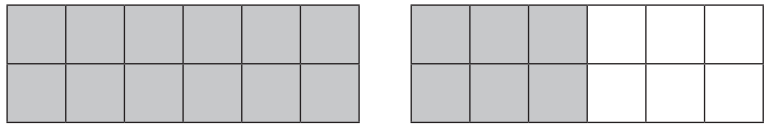


e

2 Write a mixed number and an improper fraction to describe the portion of the egg cartons that are shaded. Draw lines on the cartons to show equal parts.

Egg Carton	Mixed Fraction	Improper Fraction
ex 	$1\frac{1}{4}$	$\frac{5}{4}$
a 		
b 		

Home Connections

GRADE 4 – UNIT 3 – MODULE 1

Session 6

bridges® in mathematics

SAMPLE 0922

NAME | DATE

Thinking About Fractions page 1 of 2

When you solve problems 1–3, sketch an egg carton or fraction strip model to show your thinking.

1 Rico's dad brought home 2 sub sandwiches. The veggie sandwich was cut into 6 equal pieces. The club sandwich was cut into 12 equal pieces.

Rico's little brother, Luis, ate 2 pieces of the veggie sandwich. His big sister, Carlota, ate 4 pieces of the club sandwich. Luis said Carlota got more sandwich than he did. Carlota said they got exactly the same amount.

Who was right, Luis or Carlota? How do you know?

2 Vincent says that $\frac{1}{4}$ is more than $\frac{1}{3}$ because 4 is more than 3. Do you agree with Vincent? Why or why not?

(continued on next page)

NAME | DATE

Thinking About Fractions page 2 of 2

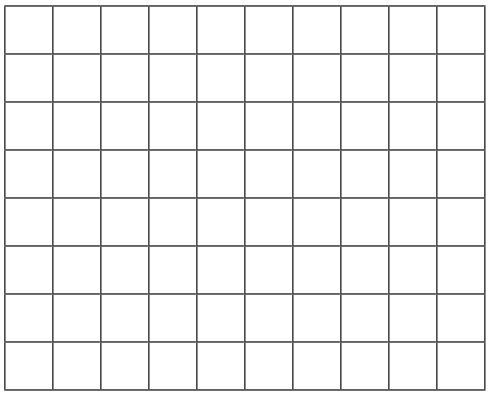
3 Talia says that $\frac{1}{3}$ and $\frac{2}{6}$ are equivalent fractions.

a Do you agree with Talia? Why or why not?

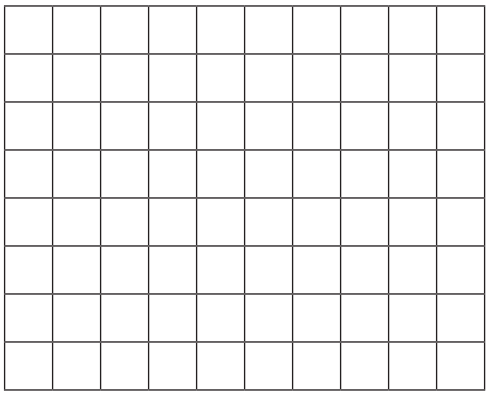
b Name a fraction that is equivalent to $\frac{1}{3}$. _____

4 **CHALLENGE** In a 12-egg carton, 2 eggs fill $\frac{1}{6}$ of the whole carton. Use the grids below to help you imagine and draw cartons where:

a 6 eggs fill $\frac{1}{6}$ of the carton.



b 25 eggs fill $\frac{5}{6}$ of the carton.



c How did you decide on the sizes of the cartons for 4a and 4b?

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