

In this lesson, students locate common fractions on a number line to decide which is greater.

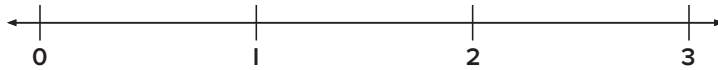
## Step 1 Preparing the lesson

Each student will need:

- Student Journal 9.10

## Step 2 Starting the lesson

Draw a number line, as shown below, on the board. Ask, *Where should we draw the mark to show the fraction one-fourth? How could we figure out where to mark each of the fourths? How do you know?* Invite individuals to explain in their own words that each interval between two adjacent whole numbers is one whole and should be divided into 4 equal parts.



## Step 3 Teaching the lesson

Split the number line on the board into fourths and say, *I am going to draw jumps of one-fourth. I want you to count the fourths with me as I jump.* Start at 0 and draw a jump from 0 to  $\frac{1}{4}$ . Repeat jumps and count aloud with students to say one-fourth, two-fourths, three-fourths, and so on.

Write  $\frac{6}{4}$  and  $\frac{3}{4}$  on the board, then discuss the points below (**SMP3**):

*What do you know about these numbers?*

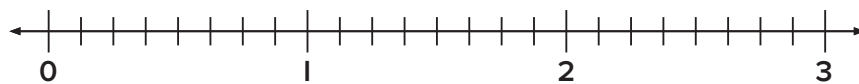
*How could you find the numbers on the number line?*

*Which number is farther away from 0?*

*Which fraction is greater?*

Encourage students to locate the two numbers on the number line and explain why  $\frac{6}{4}$  is greater than  $\frac{3}{4}$ . Repeat the discussion with  $\frac{2}{4}$  and  $\frac{5}{4}$ , then  $\frac{9}{4}$  and  $\frac{10}{4}$  (**SMP3** and **SMP6**).

Adjust the number line to show eighths, as shown below, and ask, *What do you see here? What fractions could we show?* Encourage volunteers to explain that each whole has been divided into 8 equal parts so the number line can be used to show eighths. Write  $\frac{3}{8}$  and  $\frac{7}{8}$  on the board and repeat the comparison discussion above for this pair of fractions. Then repeat the discussion with  $\frac{9}{8}$  and  $\frac{12}{8}$ , then  $\frac{15}{8}$  and  $\frac{22}{8}$  (**SMP3** and **SMP6**).



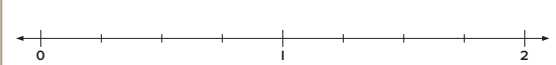
Work through the Step In discussion (Student Journal 9.10) with the whole class. Read the Step Up and Step Ahead instructions with the students. Make sure they know what to do, then have them work independently to complete the tasks.

Student Journal 9.10, pp. 346–347

**9.10 Common fractions: Making comparisons with the same denominator (number line)**

**Step In** On these number lines, the distance from 0 to 1 is one whole.


What do the marks between 0 and 1 on this number line show? How do you know?



How can you figure out which mark shows six-fourths?

Where would you label  $\frac{5}{4}$  and  $\frac{7}{4}$  on the number line? Which fraction is greater?

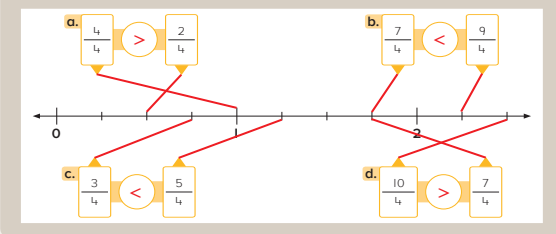
What fractions could you show on this number line?



Where would you label  $\frac{7}{8}$  and  $\frac{10}{8}$  on the number line?

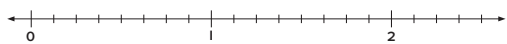
Which fraction is greater? How do you know?

**Step Up** 1. On this number line, the distance from 0 to 1 is one whole. Use a ruler to draw a line to show where each fraction is located on the number line. Then write  $<$ ,  $>$ , or  $=$  to complete each statement.




2. On each number line, the distance from 0 to 1 is one whole. For each pair of fractions write  $<$ ,  $>$  or  $=$  to make a true statement. Use the number lines to help you.

a.  $\frac{3}{8} < \frac{7}{8}$  b.  $\frac{6}{8} < \frac{9}{8}$  c.  $\frac{15}{8} > \frac{12}{8}$  d.  $\frac{17}{8} > \frac{11}{8}$



e.  $\frac{2}{6} > \frac{1}{6}$  f.  $\frac{7}{6} > \frac{5}{6}$  g.  $\frac{10}{6} < \frac{12}{6}$  h.  $\frac{15}{6} > \frac{13}{6}$



3. Write  $<$ ,  $>$  or  $=$  to make a true statement.

a.  $\frac{20}{6} > \frac{18}{6}$  b.  $\frac{16}{2} > \frac{9}{2}$  c.  $\frac{10}{4} < \frac{12}{4}$

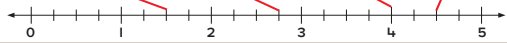
**Step Ahead** On this number line, the distance from 0 to 1 is one whole. Write a fraction to match each description. Then draw a line from each fraction to show its location on the number line.

a. greater than  $\frac{1}{4}$  less than  $\frac{7}{4}$  →  $\frac{6}{4}$

b. greater than  $\frac{10}{4}$  less than  $\frac{13}{4}$  →  $\frac{11}{4}$

c. greater than  $\frac{15}{4}$  less than  $\frac{17}{4}$  →  $\frac{16}{4}$

d. greater than  $\frac{17}{4}$  less than  $\frac{20}{4}$  →  $\frac{18}{4}$



Answers will vary. This is one example.

## Step 4 Reflecting on the work

Discuss the students' answers to Student Journal 9.10. Ask, *How can you tell which fraction is greater by looking at the number line?* (The greater fraction is to the right of the lesser fraction.) *How can you tell which fraction is greater by looking at the written fraction?* Guide students to explain that since the denominators are the same, the size of the unit fractions is the same. The numerators are then compared to determine the count of the unit fractions. (SMP3 and SMP6)

## Maintaining concepts and skills

This lesson provides one page of written practice for mental computation strategies. It also provides ongoing practice that revisits content from any previous module and earlier in this module, and a prerequisite skill for Module 10.

Student Journal 9.10, pp. 348–349

**9.10 Maintaining concepts and skills**

**Computation Practice** What is the hardest bone in the human body?

★ Write a multiplication fact you can use to figure out each division fact. Then write the quotients. Use a ruler to draw a straight line from each quotient on the left to a matching quotient on the right. The line will pass through a letter and a number. Write each letter above its matching number at the bottom of the page.

$18 \div 2 = \boxed{9}$	$\boxed{9} = 45 \div 5$
$2 \times \boxed{9} = 18$	$5 \times \boxed{9} = 45$
$28 \div 4 = \boxed{7}$	$\boxed{8} = 32 \div 4$
$4 \times \boxed{7} = 28$	$4 \times \boxed{8} = 32$
$40 \div 5 = \boxed{8}$	$\boxed{3} = 15 \div 5$
$5 \times \boxed{8} = 40$	$5 \times \boxed{3} = 15$
$6 \div 2 = \boxed{3}$	$\boxed{4} = 8 \div 2$
$2 \times \boxed{3} = 6$	$2 \times \boxed{4} = 8$
$30 \div 5 = \boxed{6}$	$\boxed{7} = 35 \div 5$
$5 \times \boxed{6} = 30$	$5 \times \boxed{7} = 35$
$16 \div 4 = \boxed{4}$	$\boxed{6} = 24 \div 4$
$4 \times \boxed{4} = 16$	$4 \times \boxed{6} = 24$

j
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b
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7

ORIGO Stepping Stones Grade 3 9.10

**Ongoing Practice** 1. Complete these to show matching times.

a. 36 minutes past  2:36

24 minutes to

b. 47 minutes past  5:47

13 minutes to

2. On each number line, the distance from 0 to 1 is one whole. Label each mark above the line and each mark below the line. Then write numerals and < or > to complete true number sentences.

a.  $\frac{1}{4} > \frac{1}{6}$

b.  $\frac{1}{3} > \frac{1}{8}$

c.  $\frac{1}{2} > \frac{1}{4}$

**Preparing for Module 10** Complete these sentences.

a. Double  is 10. SO Double  is 100.

b. Half of 4 is . SO Half of 40 is .

c. Half of 8 is . SO Half of 80 is .

ORIGO Stepping Stones Grade 3 9.10

## Cross-curricular link

### Egyptian fractions

Each student will need:

- 1 copy of Blackline Master 9.53

Distribute the blackline master and read the information with the students. Write a unit fraction on the board, then draw the matching Egyptian fraction. Discuss any similarities. For example, both fractions place the numerator above the denominator. Students continue to identify and draw Egyptian fractions on the board. Extend the activity by having students write, then solve an Egyptian fraction equation on the board.

### Blackline Master 9.53

Working with Egyptian numbers

The Egyptians were one of the first ancient civilizations to employ fractions. When writing fractions they used to use unit fractions, fractions with one on the numerator. The Egyptians used the hieroglyph to denote a fraction, as . Unusual hieroglyphs were also used to show  $\frac{2}{3}$  and  $\frac{3}{4}$ .

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## Small group differentiation

### Extra help

Each group of students will need:

- 1 copy of Blackline Master 9.54
- scissors

Organize students into groups and distribute the resources. Have them cut out the fraction cards and place them facedown. Each student chooses one card. They say the fraction aloud, then count out the number of fourths along the number line. Repeat the activity as time allows.

### Extra practice

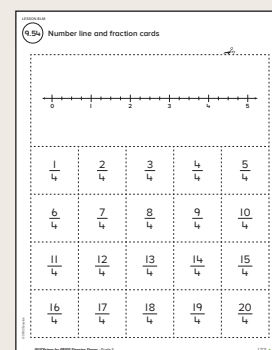
Each pair of students will need:

- 1 copy of Blackline Master 9.54
- scissors

Organize students into pairs and distribute the resources. Have them cut out the fraction cards and place them facedown. Each student chooses one card. They compare the fractions they selected and identify each fraction on the number line. The student who holds the greater fraction keeps both cards. The student with more cards after all the cards are used wins.

A variation of the game is to have students choose a whole number between 0 and 5. The student whose card is closer to that whole number wins that round.

Blackline Master 9.54



# 9.10 Maintaining concepts and skills

## Computation Practice

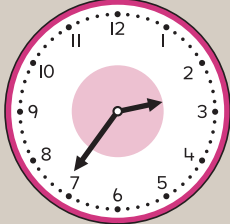

### What is the hardest bone in the human body?

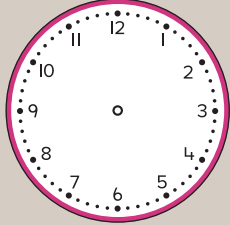

★ Write a multiplication fact you can use to figure out each division fact. Then write the quotients. Use a ruler to draw a straight line from each quotient on the left to a matching quotient on the right. The line will pass through a letter and a number. Write each letter above its matching number at the bottom of the page.

$18 \div 2 = \underline{\quad}$ $\underline{\quad} \times \underline{\quad} = \underline{\quad}$	6	n	$\underline{\quad} = 45 \div 5$ $\underline{\quad} \times \underline{\quad} = \underline{\quad}$														
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1	2	3		5	6	7											


## Ongoing Practice


1. Complete these to show matching times.


a.   minutes past   
 minutes to  

b.   minutes past   
 minutes to  

2. On each number line, the distance from 0 to 1 is one whole. Label each mark above the line and each mark below the line. Then write numerals and  $<$  or  $>$  to complete true number sentences.

a. 

b. 

c. 

## Preparing for Module 10

Complete these sentences.

a. Double  is 10  
 so Double  is 100

b. Half of 4 is   
 so Half of 40 is













c. Half of 8 is   
 so Half of 80 is

# 9.10 Maintaining concepts and skills

## Computation Practice

What is the hardest bone in the human body?

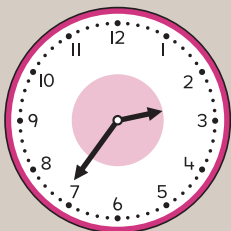
★ Write a multiplication fact you can use to figure out each division fact. Then write the quotients. Use a ruler to draw a straight line from each quotient on the left to a matching quotient on the right. The line will pass through a letter and a number. Write each letter above its matching number at the bottom of the page.

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## Ongoing Practice

I. Complete these to show matching times.

a.



36

minutes past

2

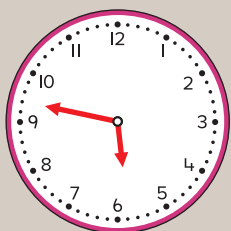
24

minutes to

3

2:36

b.



47

minutes past

5

13

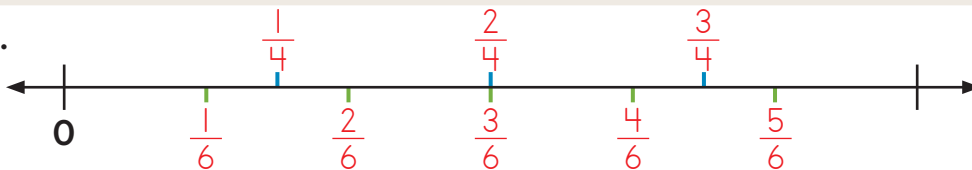
minutes to

6

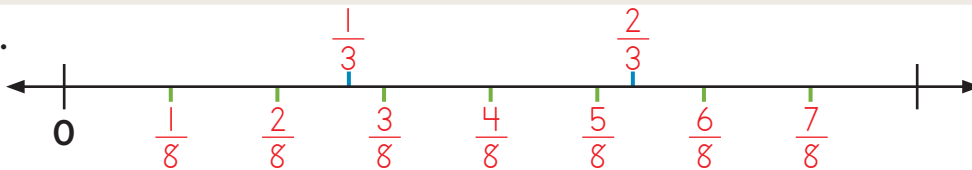
5:47

2. On each number line, the distance from 0 to 1 is one whole. Label each mark above the line and each mark below the line. Then write numerals and  $<$  or  $>$  to complete true number sentences.

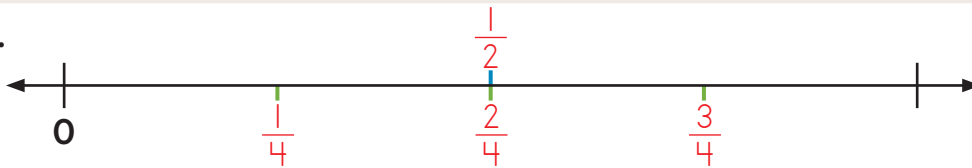
a.

 $\frac{1}{4}$  $>$  $\frac{1}{6}$ 

b.

 $\frac{1}{3}$  $>$  $\frac{1}{8}$ 

c.

 $\frac{1}{2}$  $>$  $\frac{1}{4}$ 

## Preparing for Module 10

Complete these sentences.

a.

Double 5 is 10

so

Double 50 is 100

b.

Half of 4 is 2

so

Half of 40 is 20

c.

Half of 8 is 4

so

Half of 80 is 40















# 9.10 Reforzando conceptos y destrezas

## Práctica de cálculo

¿Cuál es el hueso más duro del cuerpo humano?

★ Escribe una operación básica de multiplicación que puedas utilizar para calcular la división. Traza una línea recta desde cada cociente a la izquierda hasta el cociente correspondiente a la derecha. La línea pasará por una letra y un número. Escribe cada letra arriba del número correspondiente en la parte inferior de la página.

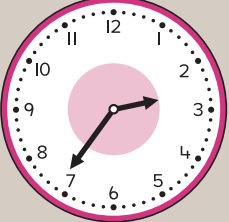

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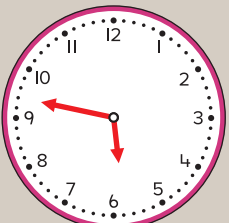

<u>q</u>	<u>u</u>	<u>i</u>	<u>j</u>	<u>a</u>	<u>d</u>	<u>a</u>
1	2	3		5	6	7

## Práctica continua

I. Completa estas dos horas correspondientes.

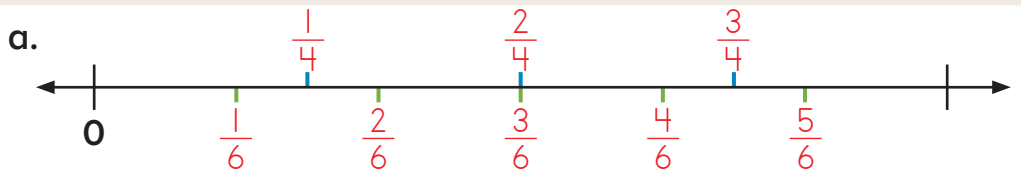
a.   $\underline{2}$  y  $\underline{36}$  minutos. 

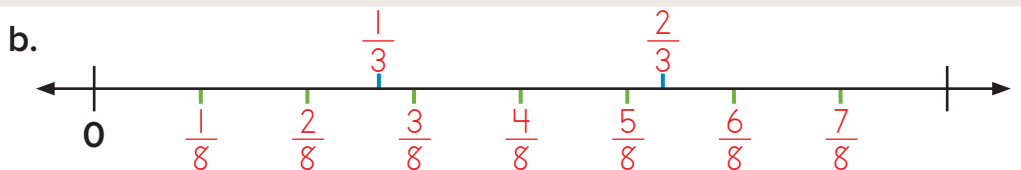
$\underline{24}$  minutos para las  $\underline{3}$

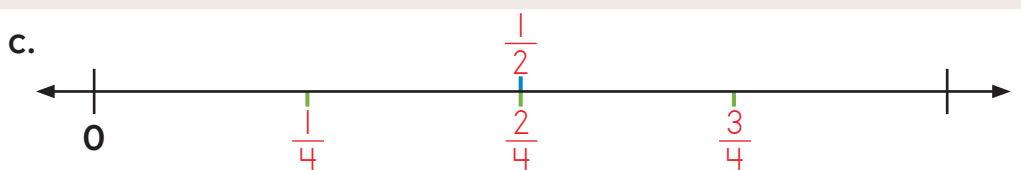
b.   $\underline{5}$  y  $\underline{47}$  minutos. 

$\underline{13}$  minutos para las  $\underline{6}$

2. En cada recta numérica la distancia de 0 a 1 es un entero. Rotula cada marca arriba de la recta y cada marca debajo de la recta. Luego escribe numerales y  $<$  o  $>$  para completar enunciados numéricos verdaderos.

a.   $\frac{1}{4} > \frac{1}{6}$

b.   $\frac{1}{3} > \frac{1}{8}$

c.   $\frac{1}{2} > \frac{1}{4}$

## Prepárate para el módulo 10

Completa estos enunciados.

a. Doble  $\underline{5}$  son 10  
entonces  
Doble  $\underline{50}$  son 100

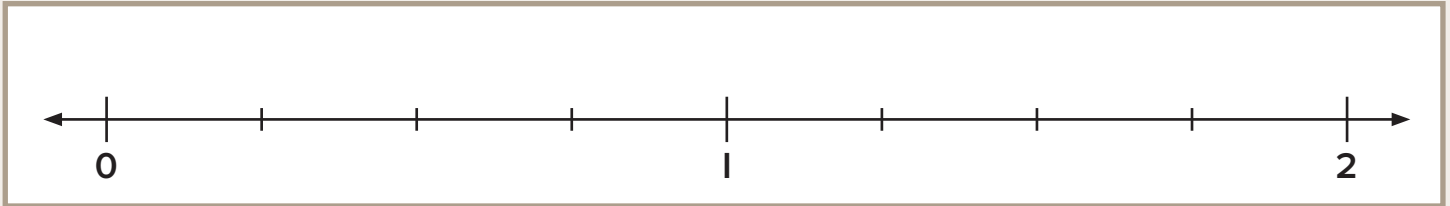
b. Mitad de 4 son  $\underline{2}$   
entonces  
Mitad de 40 son  $\underline{20}$

c. Mitad de 8 son  $\underline{4}$   
entonces  
Mitad de 80 son  $\underline{40}$

## Step In

On these number lines, the distance from 0 to 1 is one whole.

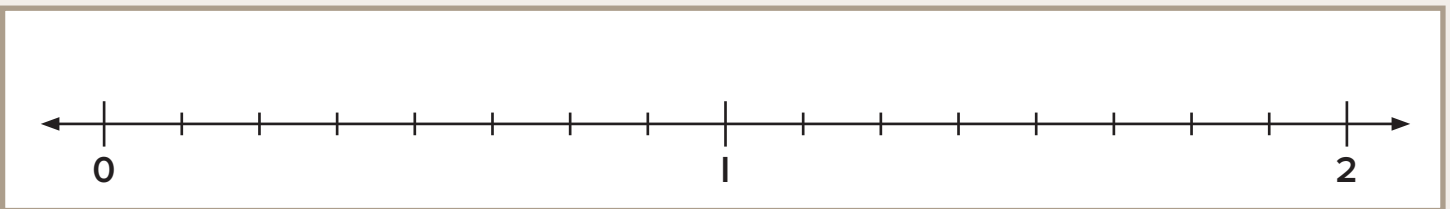
What do the marks between 0 and 1 on this number line show? How do you know?



How can you figure out which mark shows six-fourths?

Where would you label  $\frac{5}{4}$  and  $\frac{7}{4}$  on the number line? Which fraction is greater?

What fractions could you show on this number line?



Where would you label  $\frac{7}{8}$  and  $\frac{10}{8}$  on the number line?

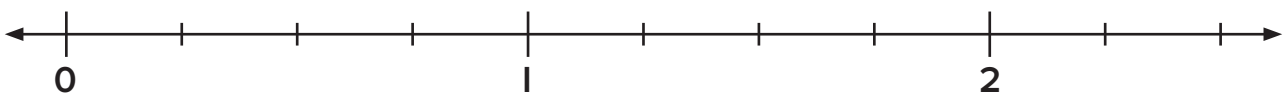
Which fraction is greater? How do you know?

## Step Up

1. On this number line, the distance from 0 to 1 is one whole. Use a ruler to draw a line to show where each fraction is located on the number line. Then write  $<$ ,  $>$ , or  $=$  to complete each statement.

a.  $\frac{4}{4}$    $\frac{2}{4}$

b.  $\frac{7}{4}$    $\frac{9}{4}$

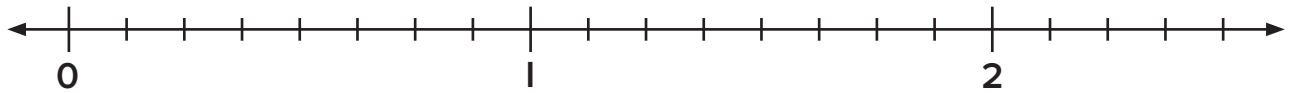


c.  $\frac{3}{4}$    $\frac{5}{4}$

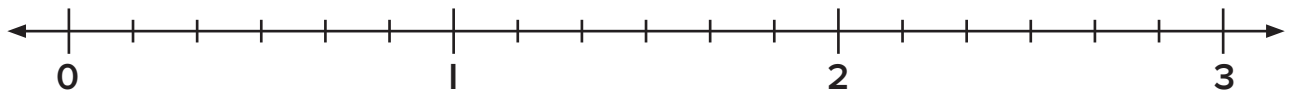
d.  $\frac{10}{4}$    $\frac{7}{4}$

2. On each number line, the distance from 0 to 1 is one whole. For each pair of fractions write  $<$ ,  $>$ , or  $=$  to make a true statement. Use the number lines to help you.

a.  $\frac{3}{8}$    $\frac{7}{8}$     b.  $\frac{6}{8}$    $\frac{9}{8}$     c.  $\frac{15}{8}$    $\frac{12}{8}$     d.  $\frac{17}{8}$    $\frac{11}{8}$



e.  $\frac{2}{6}$    $\frac{1}{6}$     f.  $\frac{7}{6}$    $\frac{5}{6}$     g.  $\frac{10}{6}$    $\frac{12}{6}$     h.  $\frac{15}{6}$    $\frac{13}{6}$



3. Write  $<$ ,  $>$ , or  $=$  to make a true statement.

a.  $\frac{20}{6}$    $\frac{18}{6}$     b.  $\frac{16}{2}$    $\frac{9}{2}$     c.  $\frac{10}{4}$    $\frac{12}{4}$

### Step Ahead

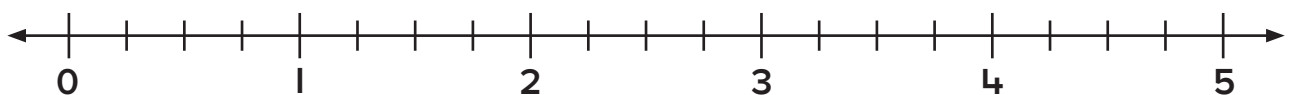
On this number line, the distance from 0 to 1 is one whole. Write a fraction to match each description. Then draw a line from each fraction to show its location on the number line.

a. greater than  $\frac{1}{4}$   
less than  $\frac{7}{4}$    

b. greater than  $\frac{10}{4}$   
less than  $\frac{13}{4}$    

c. greater than  $\frac{15}{4}$   
less than  $\frac{17}{4}$    

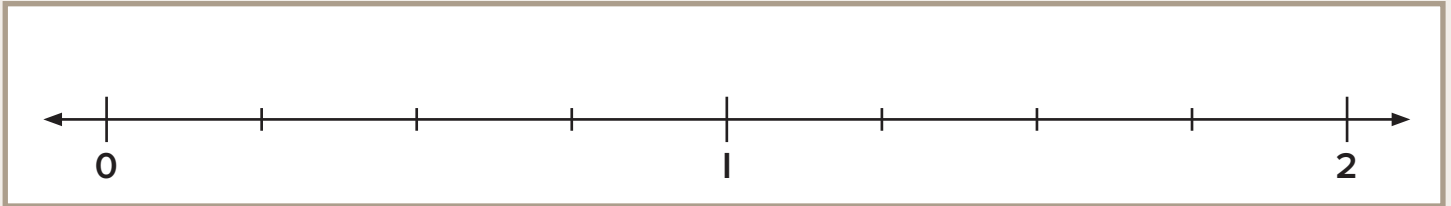
d. greater than  $\frac{17}{4}$   
less than  $\frac{20}{4}$    



## Step In

On these number lines, the distance from 0 to 1 is one whole.

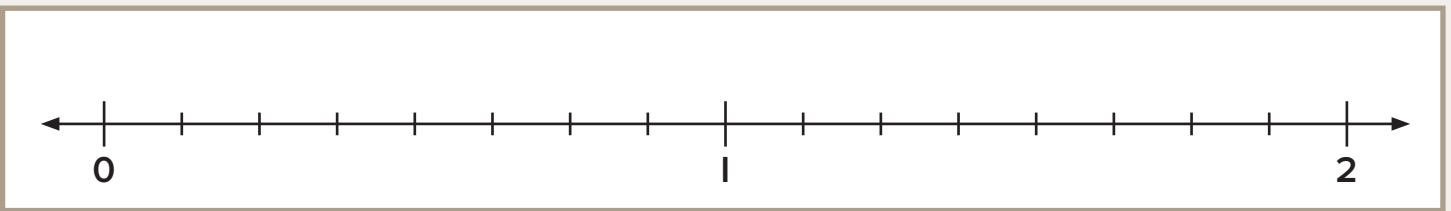
What do the marks between 0 and 1 on this number line show? How do you know?



How can you figure out which mark shows six-fourths?

Where would you label  $\frac{5}{4}$  and  $\frac{7}{4}$  on the number line? Which fraction is greater?

What fractions could you show on this number line?

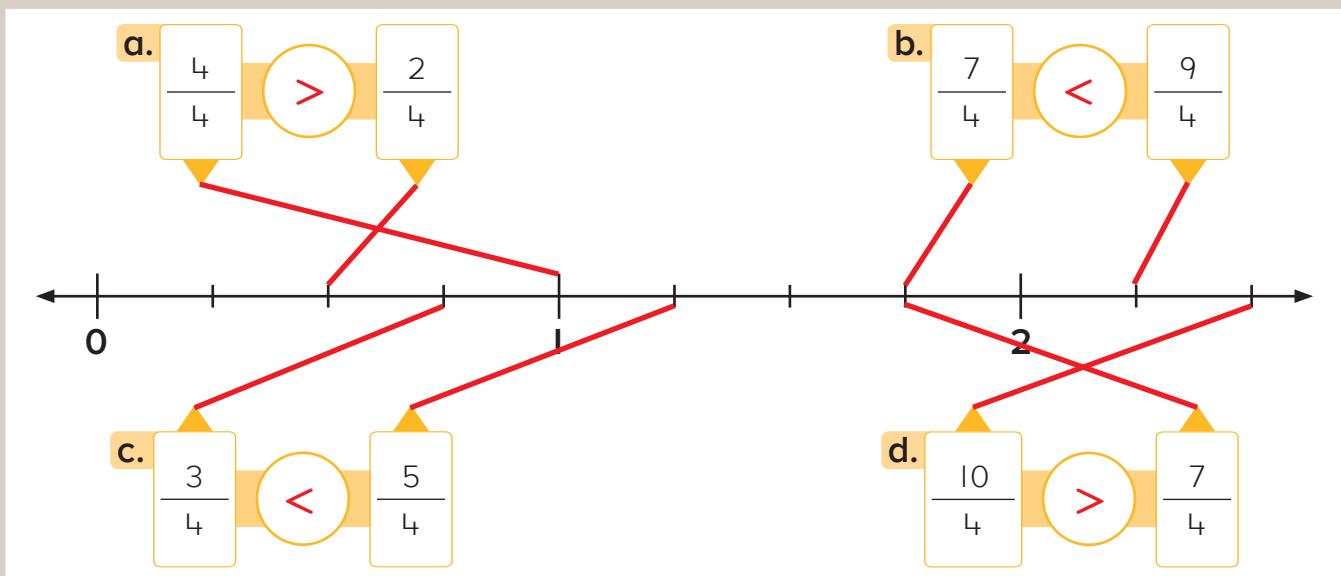


Where would you label  $\frac{7}{8}$  and  $\frac{10}{8}$  on the number line?

Which fraction is greater? How do you know?

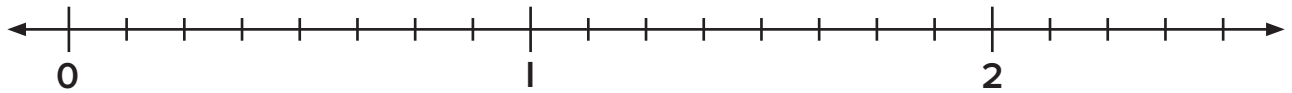
## Step Up

1. On this number line, the distance from 0 to 1 is one whole. Use a ruler to draw a line to show where each fraction is located on the number line. Then write  $<$ ,  $>$ , or  $=$  to complete each statement.

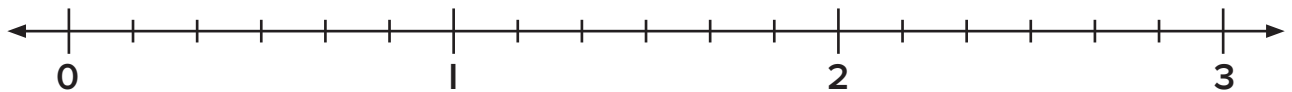


2. On each number line, the distance from 0 to 1 is one whole. For each pair of fractions write  $<$ ,  $>$ , or  $=$  to make a true statement. Use the number lines to help you.

a.  $\frac{3}{8} < \frac{7}{8}$       b.  $\frac{6}{8} < \frac{9}{8}$       c.  $\frac{15}{8} > \frac{12}{8}$       d.  $\frac{17}{8} > \frac{11}{8}$



e.  $\frac{2}{6} > \frac{1}{6}$       f.  $\frac{7}{6} > \frac{5}{6}$       g.  $\frac{10}{6} < \frac{12}{6}$       h.  $\frac{15}{6} > \frac{13}{6}$



3. Write  $<$ ,  $>$ , or  $=$  to make a true statement.

a.  $\frac{20}{6} > \frac{18}{6}$       b.  $\frac{16}{2} > \frac{9}{2}$       c.  $\frac{10}{4} < \frac{12}{4}$

### Step Ahead

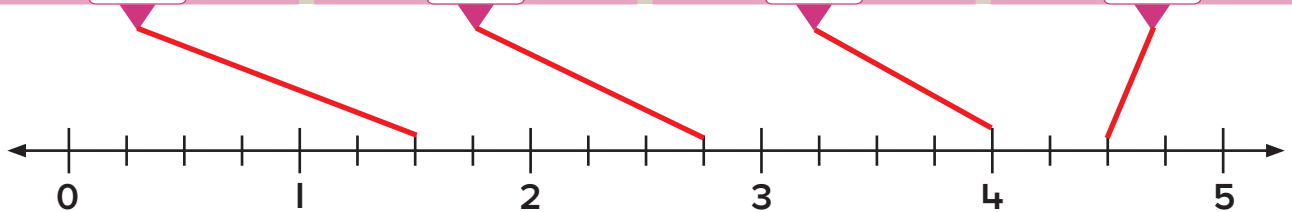
On this number line, the distance from 0 to 1 is one whole. Write a fraction to match each description. Then draw a line from each fraction to show its location on the number line.

a. greater than  $\frac{1}{4}$   
less than  $\frac{7}{4}$       \*  $\frac{6}{4}$

b. greater than  $\frac{10}{4}$   
less than  $\frac{13}{4}$       \*  $\frac{11}{4}$

c. greater than  $\frac{15}{4}$   
less than  $\frac{17}{4}$       \*  $\frac{16}{4}$












d. greater than  $\frac{17}{4}$   
less than  $\frac{20}{4}$       \*  $\frac{18}{4}$




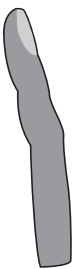


9.53



Working with Egyptian numbers



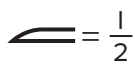
										
1	2	3	4	5	6	7	8	9	10	100

			
1,000	10,000	100,000	1,000,000

The Egyptians were one of the few ancient civilizations to employ fractions. When writing fractions they liked to use unit fractions: fractions with one as the numerator. The Egyptians used the hieroglyph  to denote a fraction, so  $\frac{1}{10}$  became .

Unique hieroglyphs were also used to show  $\frac{1}{2}$ ,  $\frac{2}{3}$ , and  $\frac{3}{4}$ .

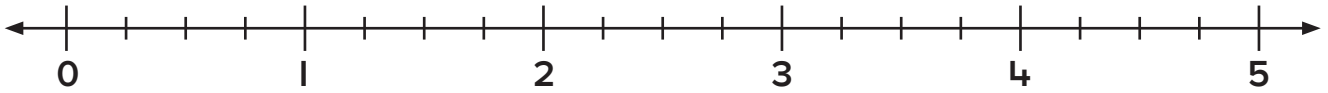
 =  $\frac{1}{2}$

 =  $\frac{2}{3}$

 =  $\frac{3}{4}$

9.54

## Number line and fraction cards



$$\frac{1}{4}$$

$$\frac{2}{4}$$

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

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

$$\frac{5}{4}$$

$$\frac{6}{4}$$

$$\frac{7}{4}$$

$$\frac{8}{4}$$

$$\frac{9}{4}$$

$$\frac{10}{4}$$

$$\frac{11}{4}$$

$$\frac{12}{4}$$

$$\frac{13}{4}$$

$$\frac{14}{4}$$

$$\frac{15}{4}$$

$$\frac{16}{4}$$

$$\frac{17}{4}$$

$$\frac{18}{4}$$

$$\frac{19}{4}$$

$$\frac{20}{4}$$



## Introducing *ORIGO Thinking Tasks*

Problem solving is at the heart of classroom mathematics and rightly receives significant attention in any curriculum. However, a growing concern within the literature is that we are exposing students to an overabundance of the same types of problems, typically ones that are low level, isolated, and quick to solve. This has led many scholars to question the mathematical dispositions that are actually being developed.

“Students who have finished a full twelve years of mathematics have worked thousands upon thousands of 'problems' – virtually none of which were expected to take the students more than a few minutes to complete.” (Schoenfeld, 2016, p. 27)

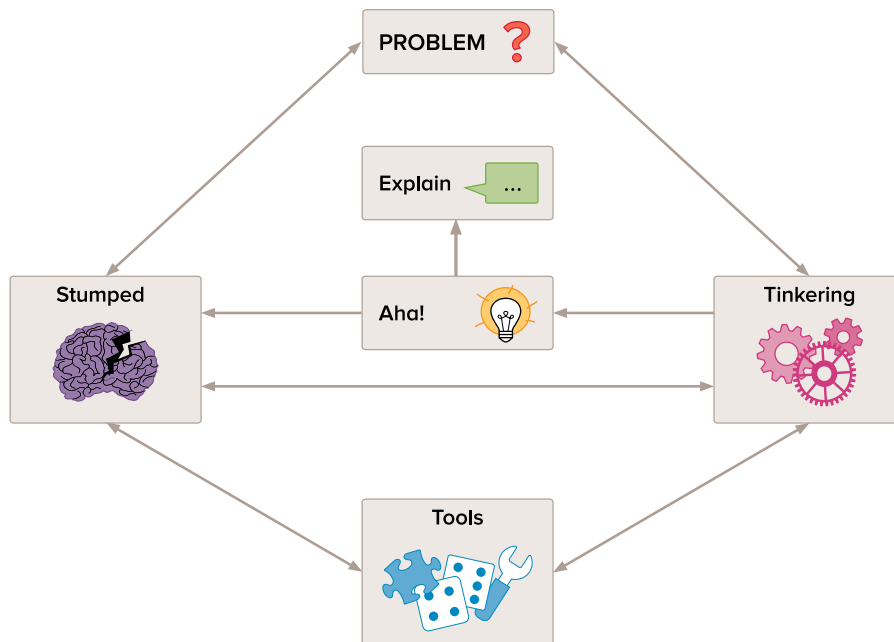
*ORIGO Thinking Tasks* break this mold by presenting students with rigorous, problem-solving opportunities. These problems may become messy and involve multiple entry points as students carve out a solution path. By placing emphasis on the complexity of problem solving, we strive to create a culture for all learners that engages and inspires while developing their confidence and perseverance in the face of challenging problems.

## Implementing *ORIGO Thinking Tasks*

- Distribute one task to each student. Read and discuss the context of the problem together to ensure that all students understand the scenario.
- Have the students work through the problems independently or collaboratively. The problems are ramped, meaning each subsequent question is likely to have a higher cognitive load than the one that came before it.
- Encourage productive discussion. Mathematics is, after all, a social construct in which students learn by sharing and critiquing each other’s ideas. Often, it is this sharing that constructs new ideas and understanding.
- These tasks are not intended to be a summative assessment item. Instead, they provide teachers with formative opportunities to observe how students approach a problem and what kinds of obstacles they encounter.
- Project the cognitive learning map (slide 1) once the students have completed the task. Encourage students to share the thinking path that they followed. What obstacles did they encounter? How might these obstacles be avoided next time?

## Interpreting the Cognitive Learning Map

Metacognition can be defined as thinking about one's thinking. There is a growing body of literature to suggest that such practices can improve student learning. The cognitive learning map shown below facilitates metacognition by helping students visualize their own thinking throughout a problem-solving process. There is no right or wrong path that students should follow. The arrows are merely a suggestion and imply that solving a problem is not a linear progression, but a winding path. For example, it is possible that one could have an *aha* moment, yet return to the preceding stage of *stumped*, if their reasoning is flawed. It's important for students to understand that this winding path, and perhaps the frustration that comes with it, is normal and expected when we set out to solve a real-world problem. Reflecting upon the thinking path they chose and the hurdles they encountered can be as valuable as the mathematics itself.



*\* The cognitive learning map was inspired by Cathy Humphreys, and refined by Cristina Charney, Janeal Maxfield, and Hailey Gilmore.*

## Recommended readings

Ball, D. L. (1993). "With an Eye on the Mathematical Horizon: Dilemmas of Teaching Elementary School Mathematics." *The Elementary School Journal*, 93(4), 373–397.

Council, N. R. (2001). *Adding It Up: Helping Children Learn Mathematics*. Washington National Academy Press.

Cuoco, A., Goldenberg, P. E., & Mark, J. (1996). "Habits of Mind: An Organizing Principle for Mathematics Curricula." *Journal of Mathematical Behavior*, 15, 375–402.

Humphreys, C. (2017). Retrieved from: <http://www.insidemathematics.org/assets/problems-of-the-month/misc/jumpstart-POM-ebook.pdf>

Lampert, M. (1990). "When the Problem is not the Problem and the Solution is not the Answer: Mathematical Knowing and Teaching." *American Educational Research Journal*, 27(1), 29–63.

Schoenfeld, A. H. (2016). "Learning to Think Mathematically: Problem Solving, Metacognition, and Sense Making in Mathematics" (reprint). *Journal of Education*, 196(2), 1–38.

**3**

**Modules 7–9**



**Preparing for a School Assembly**

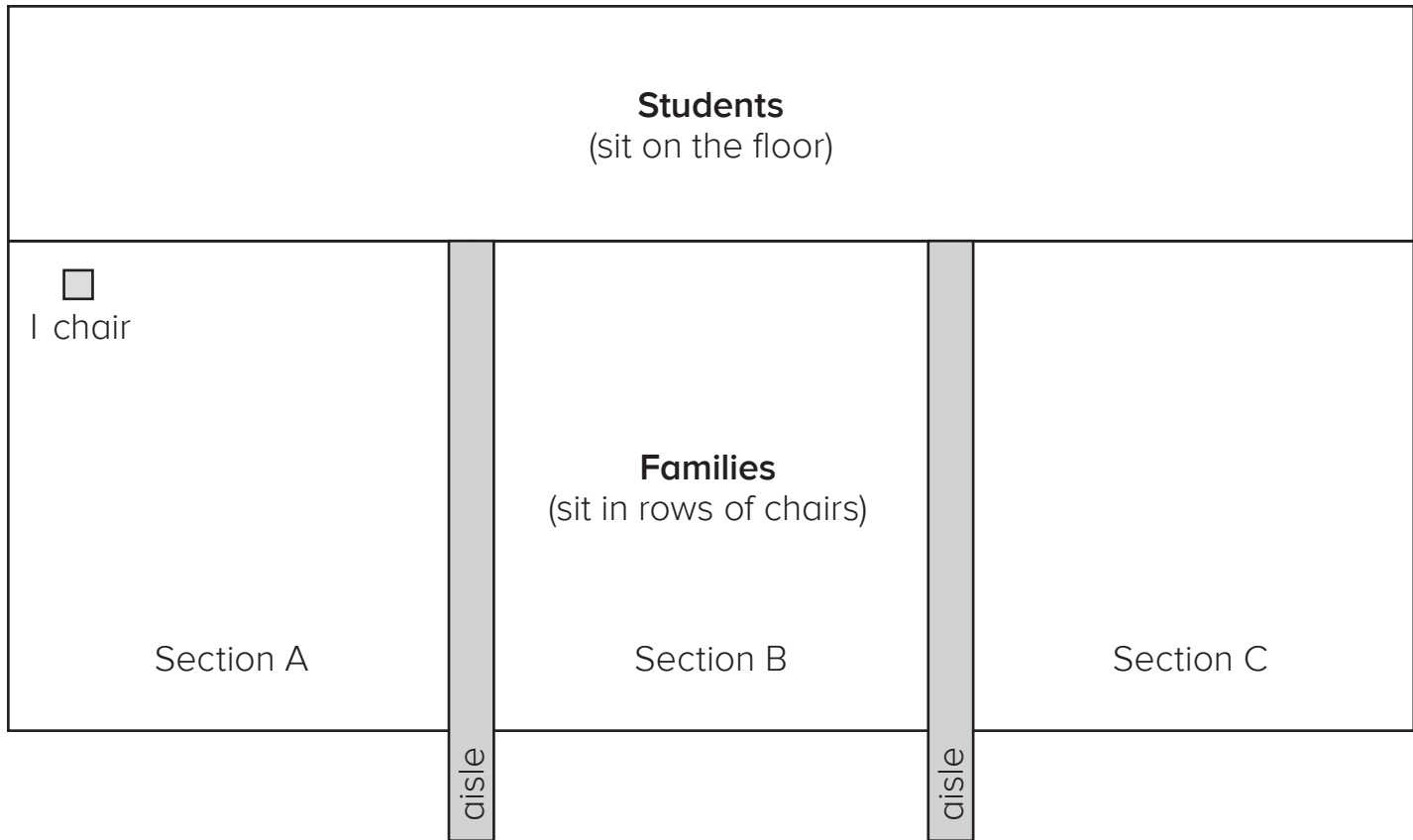
Every year in the gym, the school hosts two choir assemblies where students perform for their families. Half the families come on the first night and half the families come on the second night.

Each grade helps prepare for the choir performance. Grade 3 has two tasks:

- Set up the risers where students stand to sing. 6 students can fit on one riser.
- Set up the chairs for the families in the audience. 48 chairs fit in each section.

**Risers**

Row 3	<b>g</b>	<b>h</b>	<b>i</b>
Row 2	<b>d</b>	<b>e</b>	<b>f</b>
Row 1	<b>a</b>	<b>b</b>	<b>c</b>



Use the information in **Preparing for a School Assembly** to solve.

- I. Students will stand on the risers to sing.
- How many students will fit in each full row of risers?
  - What is the greatest number of students who can stand on all the risers to perform all at once?
- Show your thinking.

Each full row of risers holds  students.

The greatest number of students who can stand on all of the risers is .

## 3

## Modules 7–9

Use the information in **Preparing for a School Assembly** to solve.

2. Mrs. Harvey's class of 26 students will fill  $\frac{10}{6}$  of the risers in Row 1 and  $\frac{16}{6}$  of the risers in Row 2.
- Which row will have more students?
  - What is the least number of full risers they will use in each row?
  - What fraction of an extra riser will they use in each row?

Show your thinking.

Row  has more students.

Row 1: They will use  full risers and  of an extra riser.

Row 2: They will use  full risers and  of an extra riser.



## Modules 7–9



2. *Continued*

**3**

**Modules 7–9**

Use the information in **Preparing for a School Assembly** and **Question 2** to solve.

3. Mrs. Harvey will use all of the risers in Rows 1 and 2. This is her plan:

- She will fill the middle risers, **b** and **e**, first.
- She will have the same number of students on risers **a** and **c**.
- She will have the same number of students on risers **d** and **f**.

What fraction of each riser will be used? Shade the fractions on the risers to help you.

In each box, write the fraction of the riser that will be used.

Row 2	<b>d</b>	<b>e</b>	<b>f</b>
Row 1	<b>a</b>	<b>b</b>	<b>c</b>

Explain and/or show how you followed Mrs. Harvey’s plan:





## Modules 7–9



3. *Continued*

Use the information in **Preparing for a School Assembly** to solve.

4. Students must decide how to arrange the chairs in Sections A, B, and C.
- The students must seat 48 people in each section.
  - The chairs must be arranged in equal rows.

Students disagree about the best way to arrange the chairs.

- Elsa says that they can arrange the chairs in 4 rows of 12 chairs.
- Cristina suggests 8 rows of 8 chairs.
- Miguel thinks that it would be better to arrange them in 8 rows of 6 chairs.

Do you agree with Elsa, Cristina, or Miguel?

For this question:

- Explain why you agree with Elsa, Cristina, or Miguel.
- Show your thinking.



## Modules 7–9



4. *Continued*

Use the information in **Preparing for a School Assembly** to solve.

5. The school principal is expecting 154 guests to attend the choir assembly on the first night and 178 on the second night.

The principal asks Grade 3 to find out:

- Are more than 300 guests expected to attend the choir over both nights?
- Will there be enough chairs for each night?
- If not, how many more chairs are needed each night?

Write a plan to organize the chairs.

Include:

- An explanation of how you know if there are over 300 guests attending over *both* nights.
- The number of chairs that can fit in the gym for *each* night.
- How many more chairs they may need for *each* night.



## Modules 7–9



5. *Continued*

# 9.10 Reforzando conceptos y destrezas

## Práctica de cálculo

¿Cuál es el hueso más duro del cuerpo humano?

★ Escribe una operación básica de multiplicación que puedas utilizar para calcular la división. Traza una línea recta desde cada cociente a la izquierda hasta el cociente correspondiente a la derecha. La línea pasará por una letra y un número. Escribe cada letra arriba del número correspondiente en la parte inferior de la página.

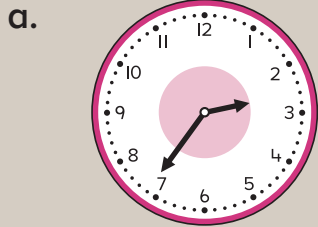
$18 \div 2 = \underline{\quad}$ ____ × ____ = _____	6	d	$\underline{\quad} = 45 \div 5$ ____ × ____ = _____
$28 \div 4 = \underline{\quad}$ ____ × ____ = _____		2	$\underline{\quad} = 32 \div 4$ ____ × ____ = _____
$40 \div 5 = \underline{\quad}$ ____ × ____ = _____	u	7	$\underline{\quad} = 15 \div 5$ ____ × ____ = _____
$6 \div 2 = \underline{\quad}$ ____ × ____ = _____	a	5	$\underline{\quad} = 8 \div 2$ ____ × ____ = _____
$30 \div 5 = \underline{\quad}$ ____ × ____ = _____	q	i	$\underline{\quad} = 35 \div 5$ ____ × ____ = _____
$16 \div 4 = \underline{\quad}$ ____ × ____ = _____	3	l	$\underline{\quad} = 24 \div 4$ ____ × ____ = _____

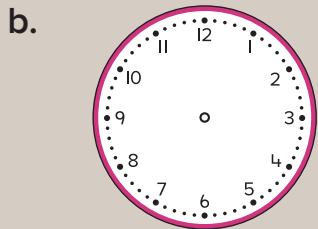
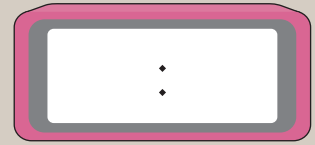
$\underline{\quad}$	$\underline{\quad}$	$\underline{\quad}$	j	$\underline{\quad}$	$\underline{\quad}$	$\underline{\quad}$
1	2	3		5	6	7

## Práctica continua

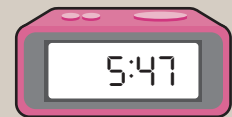
I. Completa estas dos horas correspondientes.



\_\_\_\_\_ y \_\_\_\_\_ minutos.  
 \_\_\_\_\_ minutos para las \_\_\_\_\_



\_\_\_\_\_ y \_\_\_\_\_ minutos.  
 \_\_\_\_\_ minutos para las \_\_\_\_\_



2. En cada recta numérica la distancia de 0 a 1 es un entero. Rotula cada marca arriba de la recta y cada marca debajo de la recta. Luego escribe numerales y  $<$  o  $>$  para completar enunciados numéricos verdaderos.



## Prepárate para el módulo 10

Completa estos enunciados.

a. Doble \_\_\_\_\_ son 10

entonces

Doble \_\_\_\_\_ son 100

b. Mitad de 4 son \_\_\_\_\_

entonces

Mitad de 40 son \_\_\_\_\_

c. Mitad de 8 son \_\_\_\_\_

entonces

Mitad de 80 son \_\_\_\_\_

## Conoce

En estas rectas numéricas la distancia de 0 a 1 es un entero.

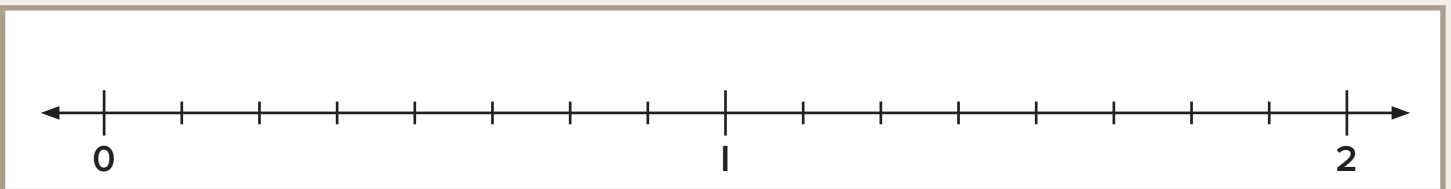
¿Qué indican las marcas entre el 0 y el 1 en esta recta numérica? ¿Cómo lo sabes?



¿Cómo puedes calcular cuál marca indica seis cuartos?

¿Dónde rotularías  $\frac{5}{4}$  y  $\frac{7}{4}$  en la recta numérica? ¿Cuál fracción es mayor?

¿Qué fracciones podrías indicar en esta recta numérica?



¿Dónde rotularías  $\frac{7}{8}$  y  $\frac{10}{8}$  en la recta numérica?

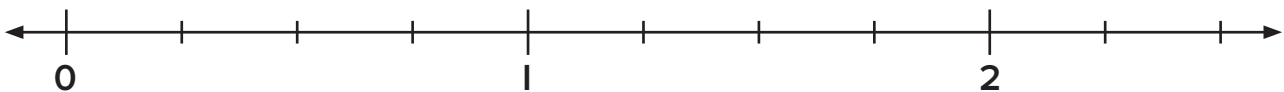
¿Cuál fracción es mayor? ¿Cómo lo sabes?

## Intensifica

I. En cada recta numérica la distancia de 0 a 1 es un entero. Traza una línea para indicar dónde se ubica cada fracción en la recta numérica. Luego escribe  $<$ ,  $>$  o  $=$  para completar cada declaración.

a.  $\frac{4}{4}$    $\frac{2}{4}$

b.  $\frac{7}{4}$    $\frac{9}{4}$



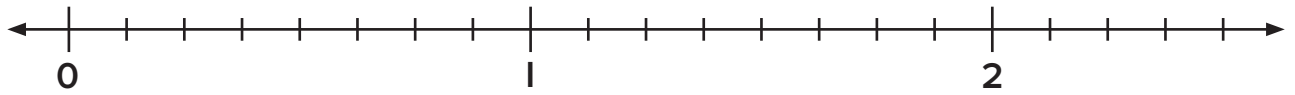
c.  $\frac{3}{4}$    $\frac{5}{4}$

d.  $\frac{10}{4}$    $\frac{7}{4}$

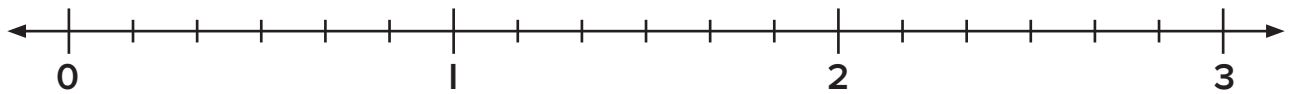


2. En cada recta numérica la distancia de 0 a 1 es un entero. En cada par de fracciones escribe  $<$ ,  $>$  o  $=$  para que los enunciados sean verdaderos. Utiliza la recta numérica como ayuda.

a.  $\frac{3}{8}$    $\frac{7}{8}$       b.  $\frac{6}{8}$    $\frac{9}{8}$       c.  $\frac{15}{8}$    $\frac{12}{8}$       d.  $\frac{17}{8}$    $\frac{11}{8}$



e.  $\frac{2}{6}$    $\frac{1}{6}$       f.  $\frac{7}{6}$    $\frac{5}{6}$       g.  $\frac{10}{6}$    $\frac{12}{6}$       h.  $\frac{15}{6}$    $\frac{13}{6}$



3. Escribe  $<$ ,  $>$  o  $=$  para que los enunciados sean verdaderos.

a.  $\frac{20}{6}$    $\frac{18}{6}$       b.  $\frac{16}{2}$    $\frac{9}{2}$       c.  $\frac{10}{4}$    $\frac{12}{4}$

### Avanza

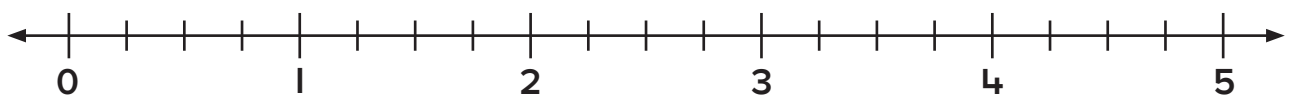
En esta recta numérica la distancia de 0 a 1 es un entero. Escribe la fracción que corresponda a cada descripción. Traza una línea desde cada fracción para indicar su ubicación en la recta numérica.

a. mayor que  $\frac{1}{4}$   
menor que  $\frac{7}{4}$

b. mayor que  $\frac{10}{4}$   
menor que  $\frac{13}{4}$

c. mayor que  $\frac{15}{4}$   
menor que  $\frac{17}{4}$












d. mayor que  $\frac{17}{4}$   
menor que  $\frac{20}{4}$




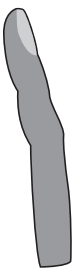


9.53



Trabajando con números egipcios





										
1	2	3	4	5	6	7	8	9	10	100

			
1,000	10,000	100,000	1,000,000

Los egipcios fueron una de las pocas civilizaciones antiguas en emplear fracciones. Al escribir fracciones, utilizaban fracciones unitarias, es decir, fracciones con un uno como numerador. Los egipcios usaban el jeroglífico  para denotar una fracción, entonces  $\frac{1}{10}$  se convertía en .

También se empleaban jeroglíficos únicos para indicar  $\frac{1}{2}$ ,  $\frac{2}{3}$  y  $\frac{3}{4}$ .

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