

# Fractions on a Number Line

## Math Focus Points

- ◆ Representing fractions on a number line
- ◆ Identifying equivalent fractions

| Today's Plan   |   | Materials   |
|--|---|---|
| <b>1</b> <small>ACTIVITY</small><br><b>Fractions on Number Lines</b> |  45 MIN<br> PAIRS<br> CLASS | <ul style="list-style-type: none"> <li>• <i>Student Activity Book</i>, p. 8B or <b>C42, Halves, Fourths, and Eighths on Number Lines</b> Make copies. (as needed)</li> <li>• Chart paper</li> </ul> |
| <b>2</b> <small>DISCUSSION</small><br><b>Fourths and Eighths</b>     |  15 MIN<br> CLASS  | <ul style="list-style-type: none"> <li>• Students' completed copies of <i>Student Activity Book</i>, p. 8B or C42 (from Activity 1)</li> <li>• Chart paper</li> </ul>                               |
| <b>3</b> <small>SESSION FOLLOW-UP</small><br><b>Daily Practice</b>   |   | <ul style="list-style-type: none"> <li>• <i>Student Activity Book</i>, p. 8C or <b>C43, On the Farm</b> Make copies. (as needed)</li> </ul>   |

## Ten-Minute Math

**Today's Number** Write the number 592 on the board. Ask students to write it in expanded form, and to share how they would round it to the nearest ten and hundred. Then, students create expressions that equal 592. They must use addition and multiplication in each expression. For example,  $9 \times 10 + 250 + 250 + 2$ . Collect a few expressions to write on the board and ask students to explain how they know they equal 592.

## Teaching Note

- 1 **Precision in Marking Fractions** When marking fractions on a number line, it can be challenging to make the parts exact without measuring them with a ruler. During this activity, students should make the fractional parts as close to equal as they can, but the emphasis is not on precision.



## ACTIVITY

## Fractions on Number Lines

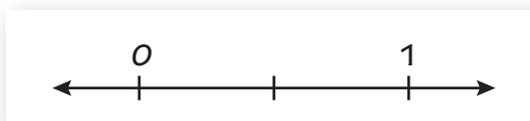


Draw a number line on a piece of chart paper with 0 and 1 marked at either end.



Today we are going to use a number line to think about fractions between 0 and 1. What if I wanted to mark the spot halfway between 0 and 1? Where should I draw a line?

Draw the line so it is halfway between 0 and 1.



We have now divided the number line into two pieces. What fraction of the whole number line is each piece? (*Each piece is half of the whole number line.*)

If an ant is traveling on the line, starting from 0 and going to 1, how many halves has the ant traveled when it starts at 0? [Ines] says that the ant hasn't traveled at all, so the ant has traveled 0 halves.

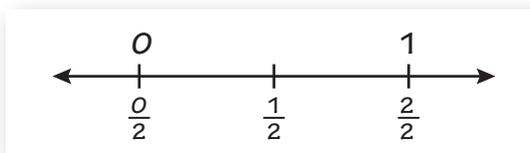
Label  $\frac{0}{2}$  on the number line.

How many halves has the ant traveled when it gets to the mark we drew between 0 and 1? (*One half*)

Label  $\frac{1}{2}$  on the number line.

How many halves has the ant traveled when it gets to 1? (*Two halves*)

Label  $\frac{2}{2}$  on the number line.



Ask students to look at *Student Activity Book* page 8B or C42.

On the first number line, mark  $\frac{0}{2}$ ,  $\frac{1}{2}$ , and  $\frac{2}{2}$ , just as we did. Then divide the second number line into four equal parts, or fourths. 1

Give pairs a few minutes to work before discussing their strategies.

**Students might say:**



“We divided the number line in half and then divided each half in half again. That makes fourths.”



“We thought about a ruler. Each inch is divided into four parts. Each part is one fourth of an inch.”

Draw a second number line directly under the first. Mark off 0 and 1 so they line up with the 0 and 1 on the first number line. Ask a student to show how to divide the number line into four equal parts.

To divide the number line into four equal parts, there are 3 lines between 0 and 1. Why aren't there 4 lines?

**Students might say:**



“We didn't want 4 lines, we wanted 4 parts.”



“Drawing 3 lines divides it into 4 parts. If you drew 4 lines, it would make 5 parts.”

We have divided the number line into four equal parts. ② What fraction is each of the pieces? (*One fourth*)

Work with a partner to label how many fourths the ant has traveled when it arrives at each line. Then divide the last number line into eighths and label the eighths.

### ONGOING ASSESSMENT: Observing Students at Work



Students represent halves, fourths, and eighths on number lines.

- **How do students divide the number lines into equal fractional parts?** Do they use other fractions to help them? Do they label each fractional part correctly?

### Teaching Note

- ② **Equal Parts** Students may mistake the number of marks on the number line as being equal to the number of parts. You can reinforce that the number line is divided into four equal parts by pointing to each segment and counting from 1 to 4.

Name \_\_\_\_\_ Date \_\_\_\_\_

**Teaching Fair Shares**

#### Halves, Fourths, and Eighths on Number Lines

1. Divide the zero-to-one number line in half. Label each half.



2. Divide the zero-to-one number line into fourths. Label each fourth.



3. Divide the zero-to-one number line into eighths. Label each eighth.



© Pearson Education, Inc. Session 1.4A Unit 7 88

- ▲ **Student Activity Book, Unit 7, p. 8B; Resource Masters, C42**



### DIFFERENTIATION: Supporting the Range of Learners

**Intervention** Some students may find it challenging to divide the number lines into equal fractional parts. If students are having difficulty with fourths, help them see that they can divide the number line into halves and then divide each half in half again. If students are having difficulty with eighths, encourage them to think about how the number line that's divided into fourths could help them.

**Extension** Ask students who easily divided the number lines into fourths and eighths to divide another number line into twelfths or fifths and name the fractional parts. They can also solve problems about an ant walking on one of the number lines. For example, if the ant walked  $\frac{2}{8}$  of the way from 0 to 1, how much farther does the ant have to walk?

## 2

### DISCUSSION

## Fourths and Eighths



15 MIN



CLASS

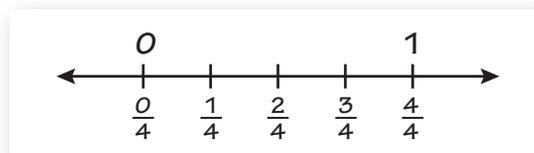
### Math Focus Points for Discussion

- ◆ Representing fractions on a number line
- ◆ Identifying equivalent fractions

Point to the second number line drawn on the chart paper.

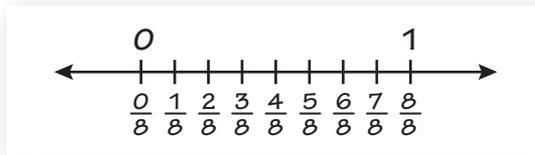
Let's think about the ant again. How many fourths has it traveled when it starts at 0? ( $\frac{0}{4}$ ) If the ant travels from 0 to the first line, how many fourths has it traveled? ( $\frac{1}{4}$ ) How many fourths has it traveled from 0 to the second line? ( $\frac{2}{4}$ ) What about from the 0 to the third line? ( $\frac{3}{4}$ ) How many fourths has the ant traveled from 0 to 1? ( $\frac{4}{4}$ )

Label each mark on the second number line with the appropriate fourth.



Draw a third number line on the chart paper under the fourths line and mark 0 and 1 on it, lining them up with the 0 and 1 on the two other number lines.

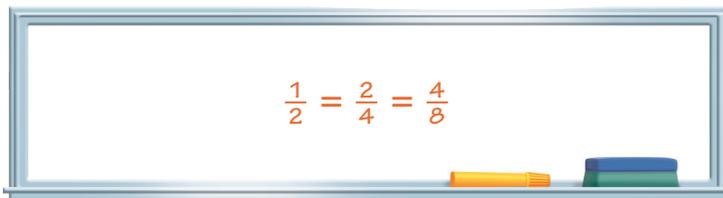
Ask students to explain and show how they divided the number line into eighths and how they labeled the eighths.



Ask students to look at all three number lines.

If the ant travels half the distance from 0 to 1 on the number line divided into fourths, how many fourths has it traveled? ( $\frac{2}{4}$ ) What if the ant traveled half the distance on the number line divided into eighths? How many eighths has it traveled? ( $\frac{4}{8}$ )

Record the following equation and ask students if they think it is true.



Students might say:



“I know  $\frac{1}{4}$  is half of  $\frac{1}{2}$ , so two  $\frac{1}{4}$ s equals  $\frac{1}{2}$ . And  $\frac{1}{8}$  is half of  $\frac{1}{4}$ , so four  $\frac{1}{8}$ s equals  $\frac{1}{4}$ .”



“They are all halfway between 0 and 1.”

We’ll be looking more at fractions that are equal tomorrow, and also thinking about ways to compare fractions.

Save the chart paper for use in Session 1.4B.

## 4 SESSION FOLLOW-UP Daily Practice



**Daily Practice:** For reinforcement of this unit’s content, have students complete *Student Activity Book* page 8C or C43.

Name \_\_\_\_\_ Date \_\_\_\_\_

**Reading Fair Shares** Daily Practice

**On the Farm** NOE! Students solve problems by multiplying 1-digit numbers. 39-41

Solve each problem. Show your work.

- A farmer feeds the horses on his farm 9 bales of hay every day. How many bales does the farmer feed the horses in 1 week?
- There are 9 chickens in the chicken coop. Each chicken laid 9 eggs. How many eggs did the chickens lay?
- There are 9 cows on the farm. They each produced 6 gallons of milk. How much milk did the cows produce?
- There are 7 spiders in the barn. Each spider has 8 legs. How many legs do the spiders have altogether?

BC Unit 7 Session 1.4A

▲ Student Activity Book, Unit 7, p. 8C; Resource Masters, C43



# How Many Robins?

Use the pictograph to answer the problems.

**NOTE** Students interpret a pictograph.

| Number of Robins I Saw |   |
|------------------------|---|
| Monday                 |    |
| Tuesday                |    |
| Wednesday              |    |
| Thursday               |    |
| Friday                 |  |

Each  = 3 robins

- On which day did I see the greatest number of robins?  
\_\_\_\_\_
- On which day did I see the fewest number of robins?  
\_\_\_\_\_
- How many robins did I see on Wednesday?  
\_\_\_\_\_ robins
- How many more robins did I see on Thursday than Monday?  
\_\_\_\_\_ robins

# Halves, Fourths, and Eighths on Number Lines

1. Divide the zero-to-one number line in half.  
Label each half.



2. Divide the zero-to-one number line into fourths.  
Label each fourth.



3. Divide the zero-to-one number line into eighths.  
Label each eighth.





# On the Farm

Solve each problem. Show your work.

**NOTE** Students solve problems by multiplying 1-digit numbers.

**SMH** 39–41

1. A farmer feeds the horses on his farm 9 bales of hay every day. How many bales does the farmer feed the horses in 1 week?
  
  
  
  
  
  
  
  
  
  
2. There are 9 chickens in the chicken coop. Each chicken laid 9 eggs. How many eggs did the chickens lay?
  
  
  
  
  
  
  
  
  
  
3. There are 9 cows on the farm. They each produced 6 gallons of milk. How much milk did the cows produce?
  
  
  
  
  
  
  
  
  
  
4. There are 7 spiders in the barn. Each spider has 8 legs. How many legs do the spiders have altogether?