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## Tier 2 Mathematics Intervention

### Module: *Fraction & Decimal Relationships (FDR)*

# Teacher Lesson Booklet

The Meadows Center
FOR PREVENTING EDUCATIONAL RISK
THE UNIVERSITY OF TEXAS AT AUSTIN
COLLEGE OF EDUCATION

Mathematics Institute for Learning Disabilities and Difficulties

# www.meadowscenter.org

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**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 1

# Building Tenths

| Lesson Objectives | • The student will model, read, and write tenths using concrete objects and pictorial models. <br> • The student will create and use representations to organize, record, and communicate fractions to peers and teachers. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | tenths, numerator, denominator, equivalent | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 1 – 16) <br> • Base-10 materials: 1 whole, 10 tenths <br> • Whiteboard with marker <br> • Tenths Mat (laminated) | • Student Booklet (pp.1- 8) <br> • Base-10 materials: 1 whole, 10 tenths (1 set per student) <br> • Dry erase marker (1 per student) <br> • Tenths Mat (laminated, 1 per student) |

## Preview

**Say:** **Today we will model tenths and write fractions.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students complete the *Engaged Practice Sheet* to review fractions.

**Say:** **On your sheet there are rectangles divided into equal parts. Look at the shaded portion and write a fraction for the shaded portion of each rectangle.**

Ask questions and give instructions such as:

- How many equal parts are in the whole?

- How many are shaded?

- Say the fraction.

- Name the number of parts. What is the numerator?

- Name the number of parts in the whole. What is the denominator?

- How many have 2 shaded parts? 4 shaded parts? More than 4 shaded parts?

## Modeled Practice                                    Time: 8 min

1. Students will model tenths and 1 whole.

   Use base-10 materials and the whiteboard. A hundred piece from before will now represents 1 whole. A ten piece from before will now represents 1 tenth. A ones piece from before will now represents 1 hundredth.

**Say:** **You have worked before with base-10 materials when you studied place value or maybe when working on addition and subtraction of larger numbers.**

**The base-10 materials can also be used to represent fractions and decimals.**

Hold up 1 whole.

**Say:** **This represents 1 whole. What does it represent?** *(1 whole)*

Hold up 1 tenth.

**Say:** **This represents a part of the whole. What does it represent?** *(a part of the whole)*

**How many make 1 whole?** *(10)*

Have students arrange 10 tenths on top of 1 whole.

**Say:** **We need 10 tenths to make 1 whole. How many do we need?** *(10 tenths)*

**What is the fractional name of each part?** $\left(\frac{1}{10}\right)$

**This represents $\frac{1}{10}$. What does it represent?** $\left(\frac{1}{10}\right)$

**Count the tenths. Ready, count: $\frac{1}{10}, \frac{2}{10}, \ldots \frac{10}{10}$.**

**What is $\frac{10}{10}$ the same as?** *(1 whole)*

$\frac{10}{10}$ **is equivalent to 1 whole.**

Write "$\frac{3}{10}$" on the whiteboard.

**Say:** **Say the fraction.** *(three-tenths)* **How many equal parts is the whole divided into?** *(10)* **How many equal parts do we have?** *(3)*

**What is the numerator?** *(3)* **What is the denominator?** *(10)*

**Show $\frac{3}{10}$ with your materials.**

**Ready, count: $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}$. How many tenths?** *(3 tenths)*

**How many more tenths are needed to make 1 whole?** *(seven-tenths)*

**7 more tenths are needed to make 1 whole.**

**Is $\frac{3}{10}$ greater than or less than 1?** *(less than 1)*

**How do you know?** *($\frac{3}{10}$ is the less than $\frac{10}{10}$, which is equivalent to 1 whole)*

**If $\frac{10}{10}$ is equivalent to 1 whole, then $\frac{3}{10}$ is less than $\frac{10}{10}$ or 1 whole.**

Write "$\frac{8}{10}$" on the whiteboard.

**Say:**  **Say the fraction.** *(eight-tenths)* **What is the denominator?** *(10)* **What is the numerator?** *(8)*

**Show $\frac{8}{10}$ for your materials.**

**Ready, count: $\frac{1}{10}, \frac{2}{10}, \ldots \frac{8}{10}$. How many tenths?** *(eight-tenths)*

**How many more tenths make 1 whole?** *(two-tenths)*

**2 more tenths would make 1 whole.**

**Is $\frac{8}{10}$ greater than or less than 1?** *(less than 1)* **How do you know?** *($\frac{8}{10}$ is the less than $\frac{10}{10}$)*

**If $\frac{10}{10}$ is equivalent to 1 whole, then $\frac{8}{10}$ is less than $\frac{10}{10}$ or 1 whole.**

2. Students will shade fractions using the *Tenths Mat*.

Tell students to put base-10 materials aside. Distribute a *Tenths Mat* and dry erase marker to each student.

| Teacher Note |
|---|
| Put the Tenths Mat, Tenths and Hundredths Mat, and Fractions and Decimals Mat in a sheet protector or laminate for repeated use. |

**Say:**    This is a model of 1 whole divided into tenths. It is called the tenths model. What is the value of each part? *(one-tenth)*

Each part represents $\frac{1}{10}$. How many tenths are in 1 whole? *(ten-tenths)*

Now use your marker and quickly shade $\frac{5}{10}$. Then write the fraction on the line.

How many parts did you shade in the whole? *(5)*

Look at the 5 in the fraction. What is the word we use to say how many parts we have? *(the numerator)*

What is the number of equal parts in the whole? *(10)*

Look at the 10 in the fraction. What is the word use to say how many parts are in the whole? *(the denominator)*

How many tenths are shaded? *(five-tenths)*

How many tenths are not shaded? *(five-tenths)*

How can you describe the shaded part? *(accept reasonable answers, for example: half of the tenths are shaded)*

What fraction is equivalent to $\frac{5}{10}$? *($\frac{1}{2}$)*

How much more would you shade to make 1 whole? *(five-tenths or one-half)*

Tell students to erase as needed.

**Say:**    Now write $\frac{7}{10}$ on the line and quickly shade the fraction.

How many tenths did you shade? *(seven-tenths)*

How many tenths are not shaded? *(three-tenths)*

**How many more tenths would you shade to make 1 whole?** *(three-tenths)*

Draw a line down the middle of the tenths model with a marker to compare $\frac{1}{2}$ to $\frac{7}{10}$.

**Say:** **Is $\frac{7}{10}$ greater than or less than $\frac{1}{2}$?** *(greater than $\frac{1}{2}$)* **How do you know?** *($\frac{7}{10}$ is greater than $\frac{5}{10}$)*

$\frac{7}{10}$ **is greater than** $\frac{5}{10}$.

**Is $\frac{7}{10}$ greater than or less than 1?** *(less than 1)* **How do you know?** *($\frac{7}{10}$ is the less than $\frac{10}{10}$)*

**If $\frac{10}{10}$ is equivalent to 1 whole, then $\frac{7}{10}$ is less than $\frac{10}{10}$ or 1 whole.**

**Using the tenths model, write your own fraction and shade.**

Wait 5-10 seconds for students to work. Allow students to share their work.

## Practice                                                   **Time: 8 min**

Activity 1: Students will model tenths and write fractions. Have students turn to *Practice Sheets* on pages 2 through 4. Students will work with a math partner to complete the activity.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- Say the fraction. *(nine-tenths)*

- Name the number of parts. What is the numerator? *(9)*

- Name the number of parts in the whole. What is the denominator? *(10)*

- How many tenths are shaded? *(nine-tenths)*

- How many tenths are not shaded? *(one-tenth)*

- How many tenths equal a whole? *(ten-tenths)*

- How many more tenths would make 1 whole? *(one-tenth)*

- Is $\frac{9}{10}$ greater than or less than $\frac{1}{2}$? *(greater)* How do you know? *(answers will vary)*

- Is $\frac{9}{10}$ greater than or less than 1? *(less)* How do you know? *(answers will vary)*

Have students complete the rest of the problems with a partner.

Activity 2: Using *Practice Sheets* on pages 5 and 6, students will play *Tenths Tic-Tac-Toe* to review models of tenths and write fractions.

**Say:** **With you math partner play Tic-Tac-Toe.**

**Write the fraction or shade the model. If you are correct you can claim the square with an X or an O.**

**If you finish that game, play again on the next page.**

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## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and complete as many items as possible.

   **Say:**   **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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# Module: Fraction and Decimal Relationships
## Lesson 2

# Adding and Subtracting Tenths

| Lesson Objectives | • The student will add and subtract tenths.<br>• The student will write equations using fractions.<br>• The student will create and use representations to organize, record, and communicate fractions to peers and teachers. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | tenths, numerator, denominator, sum, difference, whole, part, equation | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 17 – 32<br><br>• Base-10 materials: 10 tenths<br><br>• Whiteboard with marker<br><br>• *What's the Sentence?* Cards: Tenths | • Student Booklet (pp. 9 – 16)<br><br>• Base-10 materials: 10 tenths (1 set per student)<br><br>• Whiteboard with marker (1 per student) |

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## Preview

**Say:**   **Today we will add and subtract tenths and write equations.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Review fractions. Have students turn to the *Engaged Practice Sheet* in the Student Booklet.

**Say:**   **On your sheet are models of fractions. Write the fraction for the shaded portion of each model.**

Ask questions and give instructions such as:

- How many equal parts are in the whole? *(10)*

- What is the name of the equal parts? *(tenths)*

- How many parts are shaded?

- Name the number of parts. What is the numerator?

- Name the number of parts in the whole. What is the denominator?

- Read the fraction.

**Say:**   **For the next few problems, shade the model to represent the fraction given.**

Ask questions and give instructions such as:

- How many equal parts are in the whole? *(10)*

- What is the name of the equal parts? *(tenths)*

- How many parts did you shade?

- Name the number of parts. What is the numerator?

- Name the number of parts in the whole. What is the denominator?

## Modeled Practice                                          Time: 8 min

1. Students will add tenths using base-10 materials and write the equation on whiteboards.

   Distribute base-10 materials and whiteboards with a marker to each student. Have students model using tenths and write the fraction on the whiteboard.

**Say:**   **Make a model of $\frac{3}{10}$ and a model of $\frac{4}{10}$.**

**How many tenths in all? Ready, count: $\frac{1}{10}, \frac{2}{10}, \ldots \frac{7}{10}$.** *(seven-tenths)*

**Write the equation "$\frac{3}{10} + \frac{4}{10} = \frac{7}{10}$" on your whiteboard.**

**The equation shows that $\frac{3}{10}$ added to $\frac{4}{10}$ equals $\frac{7}{10}$.**

**Read the equation: "$\frac{3}{10} + \frac{4}{10} = \frac{7}{10}$."**

**What is the sum?** *($\frac{7}{10}$)*

**Make $\frac{9}{10}$ using your base-10 materials. Find 2 fractions that can be added to make $\frac{9}{10}$.**

**What would be the addition equation for your model?** *(allow students to orally share the equations for their model)*

**Let's all use $\frac{3}{10} + \frac{6}{10} = \frac{9}{10}$. Write the equation on your whiteboard.**

**Read the equation: "$\frac{3}{10} + \frac{6}{10} = \frac{9}{10}$."**

**The equation shows 1 way to make $\frac{9}{10}$ with 2 fractions.**

2. Students will add fractions in the context of a word problem and write the equation.

Have students turn to *Modeled Practice Sheet #1*. Have students model using tenths base-10 materials. The teacher and students complete the steps together as the lesson progresses.

**Say:** **Read the problem. Ready, read: "Katey and Rose shared a loaf of bread. Katey ate $\frac{2}{10}$ and Rose ate $\frac{4}{10}$ of the loaf of bread. How much bread did they eat?"**

**What is the question asking you to find?** *(how much bread they ate)*

**How many tenths did Katey eat?** *(two-tenths)* **Shade it.**

**How many equal parts of the whole did Rose eat?** *(four-tenths)* **Shade it.**

**How would we find how much they both ate?** *(add)*

**Count the tenths in both rectangles. Ready, count: $\frac{1}{10}, \frac{2}{10}, \dots \frac{6}{10}$.**

**How much bread did Katey and Rose eat in all?** *($\frac{6}{10}$ of a loaf of bread)* **Shade it.**

**They ate $\frac{6}{10}$ of a loaf of bread.**

**Write the equation that represents this problem.** *($\frac{2}{10} + \frac{4}{10} = \frac{6}{10}$)*

**Read the equation: $\frac{2}{10} + \frac{4}{10} = \frac{6}{10}$.**

**What does the addition equation represents?** *(how much bread Katey and Rose ate)*

3. Students will subtract fractions in the context of a word problem and write the equation.

Have students turn to *Modeled Practice Sheet #2*. Have students model using tenths base-10 materials. The teacher and students complete the steps together as the lesson progresses.

**Say:** **Read the next problem. Ready, read: "There is $\frac{8}{10}$ of a birthday cake. Kwantay ate $\frac{2}{10}$ of the cake. How much cake is left?"**

**What is the question asking you to find?** *(how much cake is left)*

**How much cake is there at the beginning?** *($\frac{8}{10}$)* **Shade in the rectangle to represent $\frac{8}{10}$. How many equal parts will you shade?** *(8)*

**How do we find how much birthday cake is left?** *(subtract)*

**How many tenths did Kwantay eat?** *(two-tenths)* **What part is being subtracted?** *(two-tenths)*

**Cross out or cross through $\frac{2}{10}$ of the $\frac{8}{10}$ on the rectangle.**

**Count the parts that are left. Ready, count: $\frac{1}{10}, \frac{2}{10}, \ldots \frac{6}{10}$. How many tenths are left?** *(six-tenths)*

**How much cake is left?** *($\frac{6}{10}$ of a cake)*

**Write the equation that represents the problem.** *($\frac{8}{10} - \frac{2}{10} = \frac{6}{10}$)*

**Read the equation: "$\frac{8}{10} - \frac{2}{10} = \frac{6}{10}$."**

**What does the subtraction equation represent?** *(how much birthday cake is left)*

## Practice                                      Time: 8 min

Activity 1: Students will add and subtract tenths and write equations. Have students turn to the *Practice Sheets* on pages 13 and 14. Students will work with a math partner to complete the activity.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- What fraction represents the first model?

- What fraction represents the second model?

- What is the equation?

- Why are the denominators not added/subtracted together?

Activity 2:  Using the *What's the Sentence? Cards: Tenths*, students will draw a card from the deck, read the problem, and write an equation on their whiteboard to solve the problem.

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:** **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 3

# Building Hundredths

| Lesson Objectives | • The student will model, read, and write hundredths using concrete objects and pictorial models.<br>• The student will create and use representations to organize, record, and communicate fractions to peers and teachers. | |
|---|---|---|
| **Vocabulary** | **hundredth:** 1 part out of a whole divided into 100 equal parts | |
| **Reviewed Vocabulary** | tenths, numerator, denominator, equivalent | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 33 – 46)<br><br>• Base-10 materials: 1 whole, 10 tenths, 20 hundredths<br><br>• Whiteboard with marker<br><br>• Hundredths Mat (laminated) | • Student Booklet (pp. 17 – 23)<br><br>• Base-10 materials: 1 whole, 10 tenths, 20 hundredths (1 set per pair)<br><br>• Whiteboard with marker (1 per student)<br><br>• Hundredths Mat (laminated, 1 per student) |

## Preview

**Say:** **Today we will model *hundredths* and write fractions.**

## Engage Prior/Informal Knowledge

**Time: 3 min**

Review tenths and 1 whole in base-10 materials. Have students make fractions using base-10 materials.

Hold up 1 whole.

**Say:** **What does this represent?** *(1 whole)*

Hold up 1 tenth.

**Say:** **What does this represent?** $(\frac{1}{10})$

**How many tenths are equivalent to 1 whole?** *(ten-tenths)*

Have students arrange 10 tenths on top of 1 whole.

**Say:** **Count the tenths. Ready, count: $\frac{1}{10}, \frac{2}{10}, \dots \frac{10}{10}$.**

**What is $\frac{10}{10}$ equivalent to?** *(1 whole)*

Write "$\frac{8}{10}$" on the whiteboard.

**Say:** **Say the fraction.** *(eight-tenths)* **Name the numerator, the number of parts.** *(8)* **Name the denominator, the number of equal parts in the whole.** *(10)*

**Make $\frac{8}{10}$ using the base-10 materials. Ready, count: $\frac{1}{10}, \frac{2}{10},$ $\dots \frac{8}{10}$. How many tenths?** *(eight-tenths)*

**How many more tenths would you need to make 1 whole?** *(two-tenths)*

**Is $\frac{8}{10}$ greater than or less than 1?** *(less than 1)*

**How do you know?** *($\frac{8}{10}$ is less than $\frac{10}{10}$, which is equivalent to 1 whole)*

**If $\frac{10}{10}$ is equivalent to 1 whole, then $\frac{8}{10}$ is less than $\frac{10}{10}$ or 1 whole.**

## Modeled Practice                                        Time: 8 min

1.  Students will model hundredths.

    Distribute base-10 materials to each student. Hold up 1 hundredth.

**Say:**   **We have worked with base-10 materials to represent 1 whole and tenths. A unit can also be used to represent one-*hundredth*.**

   **What does it represent?** *(one-hundredth)*

Write "$\frac{1}{100}$" on the whiteboard.

**Say:**   **A *hundredth* is 1 part out of a whole divided into 100 equal parts.**

   **How many equal parts?** *(100)*

Have students arrange 10 hundredths on top of 1 tenth.

**Say:**   **Use the hundredths. How many in one-tenth?** *(ten-hundredths)*

   **Count the *hundredths*. Ready, count: $\frac{1}{100}$, $\frac{2}{100}$, ... $\frac{10}{100}$.**

   **How many *hundredths*?** *(ten-hundredths)*

   **Ten-*hundredths* is equivalent to one-tenth.**

   **Why do you think they are called hundredths?** *(because is takes 1 hundred of them to make 1 whole)* **How many *hundredths* are in 1 whole?** *(one hundred-hundredths)*

   **We can skip count the *hundredths* by 10s or multiply ten-tenths by *ten-hundredths* in each tenth.**

Touch each tenth as you count the hundredths by 10s.

**Say:** **Count the *hundredths* by 10. Ready, count: $\frac{10}{100}$, $\frac{20}{100}$, … $\frac{100}{100}$.**

**How many *hundredths* are in 1 whole?** *(one hundred-hundredths)*

**One hundred-*hundredths* is equivalent to 1 whole.**

2. Students will model and write hundredths.

Write "$\frac{7}{100}$" on the whiteboard.

**Say:** **What fraction?** *(seven-hundredths)* **What is the numerator?** *(7)* **What is the denominator?** *(100)*

| Teacher Note |
| --- |
| Put the tenths and hundredths on top of 1 whole as you build. The students will be able to see how many tenths and hundredths in relation to 1 whole. |

**Say:** **Make $\frac{7}{100}$ using the base-10 materials.**

**Count the *hundredths*. Ready, count: $\frac{1}{100}$, $\frac{2}{100}$, … $\frac{7}{100}$. How many *hundredths*?** *(7)*

**What fraction?** *(seven-hundredths)*

**Make $\frac{18}{100}$ using the base-10 materials. Can you use the tenths?** *(yes)*

**How many tenths?** *(one-tenth)* **How many *hundredths*?** *(eight-hundredths)*

| Teacher Note |
| --- |
| Instead of counting each hundredth individually, remind students there are ten-hundredths in one-tenth. |

A tenth is the same as ten-*hundredths*. Count starting at the tenth. Ready, count: $\frac{10}{100}, \frac{11}{100}, \ldots \frac{18}{100}$.

**What fraction?** *(eighteen-hundredths)*

3. Students will shade fractions using the *Hundredths Mat*.

Tell students to put base-10 materials aside. Distribute the *Hundredths Mat* and dry erase marker to each student.

**Say:**    **This is a model of 1 whole divided into *hundredths*. It is called the *hundredths* model. What is the name of each part?** *(one-hundredth)*

**Each part represents $\frac{1}{100}$. How many *hundredths* are in 1 whole?** *(one-hundred-hundredths)*

**Now use your marker and quickly shade $\frac{13}{100}$. Then write the fraction on the line.**

**How many tenths are shaded?** *(one-tenth)*

**How many *hundredths* are shaded?** *(three-hundredths)*

**Count the *hundredths* shaded. Ready, count: $\frac{10}{100}, \frac{11}{100}, \frac{12}{100}, \frac{13}{100}$.**

**What fraction?** *(thirteen-hundredths)*

**Erase the model. Now, shade half of the *hundredths*. Then, write the fraction on the line.**

**How many *hundredths* are shaded?** *(fifty-hundredths)*

**What fraction?** *( $\frac{50}{100}$ )*

**Is $\frac{50}{100}$ equivalent to $\frac{1}{2}$?** *(yes)*

**How do you know?** *(half of the hundredths or fifty-hundredths are shaded)*

$\frac{50}{100}$ **is equivalent to** $\frac{1}{2}$ **because half of** $\frac{100}{100}$ **is** $\frac{50}{100}$**.**

| Teacher Note |
|---|
| Draw a line down the middle of the hundredths model with a marker to compare $\frac{1}{2}$ to $\frac{50}{100}$, if needed. |

Tell students to erase as needed.

**Say:**     **Using the *hundredths* model, write your own fraction and shade.**

Allow students to share their work.

## Practice                                                        Time: 8 min

Activity 1: Students will model hundredths and write fractions. Have students turn to the *Practice Sheets* on pages 17 and 18. Students will work with a math partner to complete the activity.

**Say:**     **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- What fraction? *($\frac{24}{100}$)*

- What is the numerator? *(24)*

- What is the denominator? *(100)*

- How many hundredths are shaded? *(twenty-four hundredths)*

- How many hundredths equal a whole? *(one hundred-hundredths)*

- How many tenths are in a whole? *(ten-tenths)*

- Is $\frac{24}{100}$ greater than or less than $\frac{1}{2}$? *(less)* How do you know?
  *(answers will vary)*

- Is $\frac{24}{100}$ greater than or less than 1? *(less)* How do you know?
  *(answers will vary)*

Activity 2: Students will play *Hundredths Tic-Tac-Toe* on the ***Practice Sheet***
on page 19 to review models of hundredths and write fractions.

**Say:**   **With you math partner play Tic-Tac-Toe.**

**Write the fraction or shade the model. If you are correct you
can claim the square with an X or an O.**

**If you finish that game, play again on the next page.**

## Independent Practice                                     Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets*
   and complete as many items as possible.

**Say:**   **You will work independently for 5 minutes. Complete as many
as you can. At the end of 5 minutes we will discuss our answers
as a group.**

2. For the remaining time: Have students share their answers with the
   group. Provide corrective feedback using mathematical language from
   the lesson. Have students mark the total number correct at the top of the
   page.

**Module: Fraction and Decimal Relationships**
Lesson 4

# Adding and Subtracting Hundredths

| Lesson Objectives | • The student will add and subtract hundredths. |
|---|---|
| | • The student will write equations using fractions. |
| | • The student will use representations to organize, record, and communicate fractions to peers and teacher. |
| **Vocabulary** | **No new words are introduced.** |
| **Reviewed Vocabulary** | hundredths, tenths, numerator, denominator, sum, difference, part, whole |

| Instructional Materials | Teacher | Student |
|---|---|---|
| | • Teacher Masters (pp. 47 – 60) | • Student Booklet (pp. 24 – 30) |
| | • Base-10 materials: 10 tenths, 10 hundredths | • Base-10 materials: 10 tenths, 10 hundredths (1 set per student) |
| | • Whiteboard with marker | • Whiteboard with marker (1 per student) |
| | • *What's the Sentence?* Cards: Hundredths | |

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## Preview

**Say:** **Today we will add and subtract hundredths and write equations.**

## Engage Prior/Informal Knowledge    Time: 3 min

Have students review modeling hundredths using base-10 materials. Distribute base-10 materials to each student.

**Say:** **What can we use to represent ten-hundredths?** *(one-tenth)*

**We can use 1 tenth to represent ten-hundredths.**

**Make $\frac{12}{100}$ using the base-10 materials.**

**How many tenths?** *(one-tenth)*

**How many hundredths?** *(two-hundredths)*

**What fraction?** *(twelve-hundredths)*

Have students make the mystery fraction using base-10 materials as you share the clues. Allow students time to complete their model before asking the group to count and reveal the mystery fraction.

**Say:** **Make the mystery fraction with the clues I give you.**

**I have three-tenths and four-hundredths.**

**Count the hundredths by 10. Ready, count: $\frac{10}{100}, \frac{20}{100}, \cdots \frac{34}{100}$.**

**What is the fraction?** *(thirty-four hundredths)*

**For the next mystery fraction, I have seven-tenths and eight-hundredths.**

**What is the fraction?** *(seventy-eight hundredths)*

**Ready, count: $\frac{10}{100}, \frac{20}{100} \cdots \frac{70}{100}, \frac{71}{100} \cdots \frac{78}{100}$.**

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**What is the fraction.** *(seventy-eight hundredths)*

Tell students to make a fraction with tens and units and share their answers if time permits.

## Modeled Practice                                    Time: 8 min

1. Students will add and subtract hundredths using base-10 materials and write an equation for their model.

   Distribute a whiteboard and marker to each student.

**Say:**   **Make a model of $\frac{5}{100}$ and second model of $\frac{3}{100}$ using the base-10 materials.**

**How many hundredths in all? Ready, count: $\frac{1}{100}, \frac{2}{100}, \ldots \frac{8}{100}$.** *(eight-hundredths)*

**What is the sum of $\frac{5}{100}$ and $\frac{3}{100}$?** *( $\frac{8}{100}$ )*

**Write an equation on your whiteboard to represent your work.**

**Read the equation you wrote on your board. Ready, read: "$\frac{5}{100} + \frac{3}{100} = \frac{8}{100}$."**

**The equation shows that $\frac{5}{100}$ added to $\frac{3}{100}$ equals $\frac{8}{100}$.**

**Now use the tenths and hundredths to make $\frac{17}{100}$.**

**How many tenths?** *(one-tenth)*

**How many hundredths?** *(seven-hundredths)*

**Take away $\frac{2}{100}$.**

**Count the tenths and then the hundredths to find out how much is left. Ready, count: $\frac{10}{100}, \frac{11}{100}, \ldots \frac{15}{100}$.**

**How much is left?** *( $\frac{15}{100}$ )*

**Write an equation on your whiteboard to represent your work.**
$(\frac{17}{100} - \frac{2}{100} = \frac{15}{100})$

**Read the equation. Ready, read: "$\frac{17}{100} - \frac{2}{100} = \frac{15}{100}$."**

**What is the difference?** *(fifteen-hundredths)*

**The equation shows that $\frac{2}{100}$ subtracted from $\frac{17}{100}$ equals $\frac{15}{100}$.**

2. Students will add fractions in the context of a word problem and write the equation.

   Have students put aside base-10 materials and turn to *Modeled Practice Sheet #1*. The teacher and students will complete the steps together as the lesson progresses.

**Say:** **We will use base-10 pictures instead of the base-10 materials to help us solve.**

**Read the problem. Ready, read: "It snowed $\frac{13}{100}$ of a meter on Monday and $\frac{16}{100}$ of a meter on Tuesday. It did not snow at all on Wednesday. How much snow fell in all 3 days?"**

**What is the question asking us to find?** *(the total amount of snow for Monday and Tuesday)*

**What is the important information?** *($\frac{13}{100}$ on Monday and $\frac{16}{100}$ on Tuesday)*

**How much did it snow Monday?** *(thirteen-hundredths)* **Shade the first hundredths model.**

**How much Tuesday?** *(sixteen-hundredths)* **Shade the second model.**

**How would we find how much snow fell both days?** *(add)*

**Count the tenths and then the hundredths. Ready, count:**
$\frac{10}{100}, \frac{20}{100}, \cdots \frac{29}{100}.$

**How much snow fell in all?** *($\frac{29}{100}$ of a meter)* **Shade in the last model.**

$\frac{29}{100}$ **of a meter of snow fell on Monday and Tuesday.**

**Write the equation that represents this problem.** *($\frac{13}{100} + \frac{16}{100} = \frac{29}{100}$)*

**Read the equation. Ready, read: "**$\frac{13}{100} + \frac{16}{100} = \frac{29}{100}.$**"**

**What does the equation represents?** *(how much snow fell on Monday and Tuesday)*

**Did we answer the question, how much snow fell in all?** *(yes)*

3. Students will subtract fractions in the context of a word problem and write the equation.

   Have students turn to *Modeled Practice Sheet #2.* The teacher and students will complete the steps together as the lesson progresses.

**Say:** **Read the next problem. Ready, read: "Ana measured $\frac{40}{100}$ of a meter of rain in the rain gauge. $\frac{20}{100}$ of a meter later evaporated. How much rain is left in the rain gauge?"**

**What is the question asking you to find?** *(how much rain was left in the rain gauge after some evaporated)*

**What does it mean for water to evaporate?** *(accept reasonable answers; for example, turn into water vapor so it is no longer in the gauge)*

**What is the important information?** *($\frac{40}{100}$ of rain, $\frac{20}{100}$ evaporated)*

**How much rain did Ana measure in the rain gauge?** *($\frac{40}{100}$ of a meter)* **Shade it.**

**How much evaporated?** ($\frac{20}{100}$ *of a meter*) **Cross it out.**

**How would we find how much rain is left?** *(subtract)*

**How much is left in the rain gauge?** ($\frac{20}{100}$ *of a meter*)

**Write the equation that represents the problem.** ($\frac{40}{100} - \frac{20}{100} = \frac{20}{100}$)

**Read the equation. Ready, read: "$\frac{40}{100} - \frac{20}{100} = \frac{20}{100}$."**

**What does the equation represent?** *(how much rain is left in the rain gauge)*

**Did we answer the question, how much rain was left in the rain gauge?** *(yes)*

## Practice
**Time: 8 min**

Activity 1: Students will add and subtract hundredths and write equations. Have students turn to *Practice Sheets* on pages 26 and 27. Students will work with a math partner to complete the activity.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- What fraction represents the first model?

- What fraction represents the second model?

- What is the equation?

- Why are the denominators not added/subtracted together?

Activity 2: Using the *What's the Sentence? Cards: Hundredths*, students will draw a card from the deck, read the problem, and write an equation to solve the word problem on their whiteboard.

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and complete as many items as possible.

**Say:**     **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 5

# Equivalent Fractions – Tenths and Hundredths

| Lesson Objectives | • The student will generate equivalent fractions with 10 and 100 in the denominator using models and computation.<br>• The student will use representations to organize, record, and communicate equivalent fractions to peers and teacher. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | equivalent fractions, numerator, denominator, tenths, hundredths, part, whole | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 61 – 74)<br><br>• Base-10 materials: 1 tenth, 15 hundredths<br><br>• Dry erase marker<br><br>• Fraction and Decimal Mat<br><br>• 2 different colored markers or pencils | • Student Booklet (pp. 31 – 37)<br><br>• Base-10 materials: 1 tenth, 15 hundredths (1 set per student)<br><br>• Dry erase marker (1 per student)<br><br>• Fraction and Decimal Mat (1 per student)<br><br>• 2 different colored markers or pencils (per student)<br><br>• *Equivalence* Cards: Tenths to Hundredths (1 set per student pair)<br><br>• *Equivalence* Sheet (1 per student pair) |

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## Preview

**Say:** **Today we will find equivalent fractions with denominators of 10 and 100.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Using the *Engaged Practice Sheet*, students will divide the fraction bar to find the equivalent fraction.

**Say:** **Use the fraction bar to find the equivalent fraction. Then show your work by multiplying by a fraction equivalent to 1 whole to find the equivalent fraction.**

Ask questions such as:

- How many equal parts did you divide each part into? *(2, 4, 2, 4)*

- What fraction equivalent to 1 whole is the first fraction multiplied by to get the equivalent fraction? $(\frac{2}{2}, \frac{4}{4}, \frac{2}{2}, \frac{4}{4})$

- What is the equivalent fraction? $(\frac{8}{10}, \frac{8}{12}, \frac{2}{6}, \frac{4}{8})$

## Modeled Practice                                   Time: 8 min

1. Find the fraction equivalent to $\frac{1}{10}$ with 100 in the denominator.

   Distribute base-10 materials to students. Display 1 tenth and 15 hundredths. Hold up the tenth piece.

**Say:** **What does this represent?** *(one-tenth)*

Hold up a hundredth piece.

**Say:** **What does this represent?** *(one-hundredth)*

   **We want to find out how many hundredths equal one-tenth. Use your base-10 materials to find the answer.**

   Allow students time to compare the hundredth piece to the tenth piece.

**Say:** **How many hundredths equal one-tenth?** *(ten hundredths)* **How do you know?** *(because ten hundredths are the same size, or same amount, as one tenth)*

Keep the base-10 materials on the table for the students to refer to if needed. Distribute a *Fraction Decimal Mat* and a dry erase marker to each student. The teacher and students will complete the steps together as the lesson progresses.

**Say:** **Look at the 2 models. What do we call the model on the left?** *(the tenths model)*

**What do we call the model on the right?** *(the hundredths model)*

**Quickly shade 1 part on the tenths model. Write the fraction on the line.**

**What is the fraction?** $(\frac{1}{10})$

**One-tenth is shaded.**

**Look at the hundredths model. How many parts are in the whole of this model?** *(100)*

**There are 100 parts. We have to shade an amount on this model that is equivalent, or equal, to 1/10. How many parts are you going to shade?** *(10)* **How do you know?** *(because ten hundredths equals 1 tenth)*

**Shade one-tenth or ten-hundredths on the hundredths model.**

Demonstrate the shading of the first column of the hundredths model.

**Say:** **What do you notice about the shaded amounts?** *(they are the same, they are equivalent)*

**How many parts are shaded?** *(10)*

**There are 10 shaded. What is the fractional name of each part?** *(one-hundredth)*

**Each part represents one-hundredth.**

**Ready, count: One-hundredth, two-hundredths … ten-hundredths.**

**What fraction represents the shaded model?** $(\frac{10}{100})$ **Write it.**

**Are these fractions equivalent?** *(yes)* **How do we know?** *(they represent the same shaded area)*

$\frac{1}{10}$ **and** $\frac{10}{100}$ **are equivalent fractions because they represent the same value, or amount.**

**Look at the denominators. What number multiplied by 10 equals 100?** *(10)* **10 times 10 equals 100.**

**What fraction equivalent to 1 whole is multiplied to the original fraction?** $(\frac{10}{10})$

**We can find how many hundredths are equivalent to any amount of tenths by multiplying the fraction by** $\frac{10}{10}$.

2. Find the fraction equivalent to $\frac{6}{10}$ with 100 in the denominator.

Have students turn to the *Modeled Practice Sheet* and use colored pencils or markers. The teacher and students will complete the steps together as the lesson progresses.

Say: **Shade** $\frac{6}{10}$ **and write the fraction.**

**Now shade the hundredths model to find what fraction with a denominator of 100 is equivalent to** $\frac{6}{10}$.

**Count the hundredths by 10. Ready, count: ten-hundredths, twenty-hundredths … sixty-hundredths.**

**How many hundredths are equivalent to** $\frac{6}{10}$? $(\frac{60}{100})$ **Write the fraction.**

$\frac{60}{100}$ **is equivalent to** $\frac{6}{10}$**. What is another way to find a fraction equivalent to** $\frac{6}{10}$**?** *(multiply by a fraction equivalent to 1 whole, $\frac{10}{10}$)*

**Compared to** $\frac{6}{10}$**, there are 10 times as many parts in the whole, and 10 times as many parts shaded in the equivalent fraction** $\frac{60}{100}$**.**

**Think about what we know about the benchmarks 0,** $\frac{1}{2}$**, and 1 whole. Where is** $\frac{1}{2}$ **on the hundredths model? (have student point to half) Is** $\frac{60}{100}$ **greater than or less than** $\frac{1}{2}$**?** *(greater than)* **How do you know?** *($\frac{60}{100}$ is greater than $\frac{50}{100}$ or $\frac{1}{2}$)*

Have students indicate where $\frac{1}{2}$ is on the hundredths model by drawing a line on their paper.

## Practice                                                                    Time: 8 min

Activity 1: Have students turn to the *Practice Sheets* on pages 33 and 34. Students will practice finding equivalent fractions with 100 in the denominator.

**Say:    Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- How many tenths are shaded? *(4, 8, 3, 2)*

- How many hundredths are equivalent? *(40, 80, 30, 20)*

- How do you know the fractions are equivalent? *(they represent the same amount shaded)*

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Activity 2: Using the *Equivalence Cards and Sheet*, students will work in pairs to practice shading fractions that are equivalent to tenths. 1 partner will hold up a card with a fraction in tenths while the other partner shades the equivalent in hundredths on the hundredths model. Partners will trade roles, with each student shading 2 of the hundredths models on a sheet.

## Independent Practice                                      Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:**     **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**Module: Fraction and Decimal Relationships**
Lesson 6

# Comparing Tenths and Hundredths

| Lesson Objectives | • The student will compare tenths and hundredths using models and common denominators.<br>• The student will create and use representations to communicate mathematical ideas to peers and teachers. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | equivalent fractions, numerator, denominator, tenths, hundredths, common denominator, part, whole | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 75 – 88)<br><br>• Dry erase marker<br><br>• Hundredths Mat<br><br>• 2 different colored markers or pencils | • Student Booklet (pp. 38 – 44)<br><br>• Dry erase marker (1 per student)<br><br>• Hundredths Mat (1 per student)<br><br>• 2 different colored markers or pencils (per student)<br><br>• *Comparison* Cards (1 set per student pair)<br><br>• *Equivalence* Sheet (1 per student pair) |

## Preview

**Say:** **Today we will compare fractions with 10 and 100 in the denominator.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students complete the *Engaged Practice Sheet* to review comparing fractions with like denominators.

**Say:** **We will compare fractions using the greater than and less than symbols.**

**Point to the greater than symbol at the top of your page. Label it. What does the greater than symbol mean?** *(the amount on the left is greater than the amount on the right)*

**Point to the less than symbol at the top of your page. Label it. What does the less than symbol mean?** *(the amount on the left is less than the amount on the right)*

**What is the name of the last symbol at the top of your page?** *(equal)* **Label it. What does equal mean?** *(the same as or the same amount)*

**How do we compare fractions with like denominators?** *(look at the numerator to see which fraction represents more pieces of the same size)*

**Use the >, <, and = symbols to compare.**

## Modeled Practice                                   Time: 8 min

1. Compare $\frac{45}{100}$ and $\frac{4}{10}$ using models.

   Have each student use the *Hundredths Mat* and a dry erase marker. The teacher and students will complete the steps together as the lesson progresses.

**Say:** **We are going to compare 2 fractions: $\frac{45}{100}$ and $\frac{4}{10}$.**

**Write "$\frac{45}{100}$" and "$\frac{4}{10}$," 1 under each hundredths model.**

**Can we compare these fractions by just comparing the numerators?** *(no)* **Why?** *(the units are different sizes)* **The units – hundredths – are different sizes, so we can't compare the numbers in the numerators. Comparing $\frac{45}{100}$ and $\frac{4}{10}$ is kind of like comparing 45 inches and 4 feet – they are both used to measure length, but inches and feet are different sized units.**

**How can you compare 2 fractions that do not have the same denominator?** *(answers vary: put them on a number line, find a common denominator)*

**Since the denominators are different, we are going to use a model and find a common denominator to compare the fractions. What a is common denominator?** *(a multiple of both denominators that is used so the denominators are the same)*

**The common denominator is a multiple of both denominators used so the denominators are the same.**

**How many hundredths are in each column?** *(ten-hundredths)*

**There are ten-hundredths in each column.**

**How many columns of ten-hundredths will you shade to represent $\frac{45}{100}$?** *(4)*

**How many additional hundredths will you need to represent $\frac{45}{100}$?** *(5)*

**Now shade $\frac{45}{100}$ on the left hundredths model.**

**How many hundredths?** *(forty five-hundredths)*

**What is the other fraction?** *($\frac{4}{10}$ )*

In the last lesson, we shaded $\frac{4}{10}$ on a hundredths model. Can you remember how? *(answers vary: 1 column represents $\frac{1}{10}$, 1 column is $\frac{10}{100}$, which is equivalent to $\frac{1}{10}$)*

In the last lesson, we learned that $\frac{1}{10}$ is equivalent to $\frac{10}{100}$ because we can multiply $\frac{1}{10}$ by $\frac{10}{10}$ to get $\frac{10}{100}$. Or 10 hundreds, 1 column, is equal to 1 tenth in the model. Shade $\frac{4}{10}$ on the second hundredths model.

How many hundredths are in $\frac{4}{10}$? *(forty-hundredths)*

There are forty-hundredths. $\frac{4}{10}$ is equivalent to $\frac{40}{100}$.

First, is $\frac{45}{100}$ greater than or less than $\frac{40}{100}$? *(greater than)*

If we know $\frac{45}{100}$ is greater than $\frac{40}{100}$, then what else do we know? *($\frac{45}{100}$ is greater than $\frac{4}{10}$)*

The models show $\frac{45}{100}$ is greater than $\frac{4}{10}$.

2. Compare $\frac{45}{100}$ and $\frac{4}{10}$ by finding a common denominator.

**Say:** Now we will find common denominators rather than use a model to compare $\frac{45}{100}$ and $\frac{4}{10}$.

What do you predict the common denominator might be? [Hint: look at the models.] *(100)*

Write "$= \frac{}{100}$" to the right of "$\frac{4}{10}$."

How do we find how many hundredths equal $\frac{4}{10}$? *(multiply by a fraction equivalent to 1 whole, $\frac{10}{10}$)*

10 times 10 is 100. 4 times 10 equals what number? *(40)* What is the equivalent fraction? *($\frac{40}{100}$)*

**Write "40" in the numerator of the second fraction.**

**Is $\frac{45}{100}$ greater than or less than $\frac{40}{100}$?** *(greater than)*

**If we know $\frac{45}{100}$ is greater than $\frac{40}{100}$, then what else do we know?** *($\frac{45}{100}$ is greater than $\frac{4}{10}$)*

**Explain how you know that $\frac{45}{100}$ is greater than $\frac{4}{10}$.** *($\frac{45}{100}$ is greater than $\frac{40}{100}$, and $\frac{40}{100}$ is equivalent to $\frac{4}{10}$)*

**Write ">" between the 2 fractions.**

| Teacher Note |
|---|
| Students may have difficulty visualizing how $\frac{40}{100}$ and $\frac{4}{10}$ are equivalent. If so, draw bold lines around each column or total amount to show that $\frac{10}{100}$ is the same as $\frac{1}{10}$, so each column represents $\frac{1}{10}$. |

3. Compare the fractions $\frac{7}{10}$ and $\frac{68}{100}$.

Have students turn to the *Modeled Practice Sheet* in their Student Booklets. The teacher and students will complete the steps together as the lesson progresses.

**Say:** **We are going to compare $\frac{7}{10}$ and $\frac{68}{100}$. Shade $\frac{7}{10}$ on the left hundredths model.**

| Teacher Note |
|---|
| Some students may still have difficulty drawing tenths on the hundredths model. Show them that each column represents one-tenth. |

**Say:** Shade $\frac{68}{100}$ on the second model.

**Compare. Is $\frac{7}{10}$ greater than or less than $\frac{68}{100}$?** *(greater than)*

**Explain how you know that $\frac{7}{10}$ is greater.** *(answers vary: more squares are shaded)*

**Now we will use common denominators to compare. What is the common denominator for 10 and 100?** *(100)*

**How do we find how many hundredths equal $\frac{7}{10}$?** *(multiply by a fraction equivalent to 1 whole, $\frac{10}{10}$)*

Give students a chance to find the equivalent fraction before solving.

**Say:** **What does 7 times 10 equal?** *(70)* **What is the equivalent fraction?** *( $\frac{70}{100}$ )*

**Is $\frac{70}{100}$ greater than or less than $\frac{68}{100}$?** *(greater than)* **Complete the comparison at the bottom of the page.**

**Explain how you know that $\frac{70}{100}$ is greater than $\frac{68}{100}$.** *(answers vary: more squares are shaded*

**Think about our benchmarks 0, $\frac{1}{2}$, and 1 whole. What can you say about these fractions?** *(both fractions are greater than $\frac{1}{2}$ and less than 1*

**We also know that $\frac{7}{10}$ is greater than $\frac{68}{100}$ because $\frac{70}{100}$ is equivalent to $\frac{7}{10}$.**

**Write ">" between the 2 fractions.**

## Practice

Activity 1: Have students turn to the *Practice Sheets* on pages 40 and 41. Students will practice comparing fractions with 10 and 100 in the denominator by modeling and finding a common denominator.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- How many hundredths are equivalent to [x]-tenths?

- How do the fractions compare in hundredths?

- How do the 2 original fractions compare?

Activity 2: Using the *Comparison Cards* and *Equivalence Sheet,* students will work in pairs to compare fractions. Place the tenths cards in a stack facing down. Do the same with the hundredths cards. Partner 1 will draw a tenth card and a hundredth card from each stack. Partner 2 will find the equivalent fraction for the tenth card by shading a hundredths model. Partner 1 will then compare the fractions cards with the help of the shaded model. Partners switch roles and draw 2 more cards.

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:**     **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction & Decimal Relationships**
Lesson 7

# Decimals to the Tenths

| Lesson Objectives | • The student will use place value to read and write decimals and fractions related to tenths.<br>• The student will use pictorial models to relate decimals and fractions that name the tenths.<br>• The student will use the vocabulary related to fractions and decimals to express mathematical ideas precisely. |
|---|---|
| Vocabulary | **decimal:** a way to express a fractional part of a whole number; the whole number is portioned into equal parts of 10 or the powers of 10<br><br>**decimal point:** a point that separates the whole number from the fractional part of a whole number (example: 15.9) |
| Reviewed Vocabulary | hundredths, tenths, numerator, denominator |

| Instructional Materials | Teacher | Student |
|---|---|---|
| | • Teacher Masters (pp. 89 – 106)<br><br>• Whiteboard with marker | • Student Booklet (pp. 45 – 53)<br><br>• Whiteboard with marker<br><br>• Base-10 materials: 1 whole, 10 tenths (1 set per student) |

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## Preview

**Say:** **Today we will discuss the relationship between fractions and decimals. We will read and write decimals.**

## Engage Prior/Informal Knowledge          Time: 3 min

Have students review modeling fractions with base-10 materials. Then have students review writing the fractions. Distribute a whiteboard and marker to each student.

**Say:** **Using the base-10 materials, show $\frac{1}{10}$. Place the tenth on top of the 1 whole.**

**How many more tenths are needed to make 1 whole?** *(9)*

**What is the numerator?** *(1)* **What does it tell us?** *(the number of parts we have out of the whole)*

**What is the denominator?** *(10)* **What does it tell us?** *(the number of equal parts in the whole)*

**Write the fraction on your whiteboard.**

 Continue to have students show $\frac{4}{10}$, $\frac{2}{10}$, $\frac{8}{10}$, and $\frac{6}{10}$ using base-10 materials on top of 1 whole. Ask students the same questions for each fraction.

## Modeled Practice          Time: 8 min

1. Students will model, read, and write fractions and decimals.

   Have students turn to *Modeled Practice Sheet #1*. The teacher and students will complete the steps as the lesson progresses.

**Say:** **Look at the shaded model. What is the fractional name of each part of the whole number?** *(one-tenth)*

**How do you know?** *(it is broken into 10 equal parts)*

**Count the fractional parts. Ready, count: $\frac{1}{10}$, $\frac{2}{10}$ … $\frac{4}{10}$. How many tenths?** *(four-tenths)*

**Write the fraction.**

**The fraction $\frac{4}{10}$ can also be written as a *decimal*.**

**A *decimal* is a way to express a part of a whole number. Both a *decimal* and a fraction represent a part of a whole number. In a *decimal*, the part of the whole number can be divided into tenths or powers of 10 like hundredths.**

**What is a *decimal*?** *(parts of a whole number divided into tenths or powers of 10)*

**To write a fraction as a *decimal*, we use a *decimal point*. A *decimal point* separates the whole number from the fractional part of the number.**

**What is used to separate the whole number from the fractional part of the whole number?** *(decimal point)*

**We will use a place value chart to write a *decimal* for the fraction $\frac{4}{10}$.**

**Find the *decimal point* on the place value chart that is below the model. The *decimal point* separates the ones or whole number from the equal part of the whole number, the tenths.**

**What does the *decimal point* separate?** *(the ones or whole number and the tenths part of the whole number)*

**What place value is to the left of the *decimal point*?** *(ones)*

**The number to the left of the *decimal point* represents ones or the whole number.**

**The number to the right of the *decimal point* represents 10 parts of 1 whole, or tenths.**

**What place value is directly to the right of the *decimal point*?** *(tenths)*

**Look at the shaded model. How many tenths are shaded?** *(4)*

What number do you think we write in the tenths place of the *decimal*? *(4)*

We write 4 in the tenths place because 4 out of 10 parts of the whole number are shaded. Write "4" in the tenths place.

Look again at the model. Is there a whole or $\frac{10}{10}$ shaded? *(no)*

There is not a whole shaded. This means that the shaded model is less than 1.

What number has a value of nothing? *(0)*

0 is written in the ones place because there is no whole number and the shaded model is less than 1. Write it.

The *decimal* is read the same way as the fraction. When we read or write a *decimal*, we use the ending "–ths" for the fractional part to the right of the *decimal point*. When you hear "-ths" at the end of tenths you know it is talking about equal parts to the right of the *decimal point*.

Practice saying tenths, "tenths."

Read the *decimal*. *(four-tenths)*

**Watch For**

**Students may read 0.4 as zero and four-tenths. Remind students that when reading a decimal number the zero is not said, it is its place value that is read. For example, in the number 300, it is not read as three zero zero.**

**Say:** Write the fraction for the next shaded model. How many wholes are shaded? *(1 whole)*

How many tenths are shaded? *(seven-tenths)*

1 and $\frac{7}{10}$ are shaded. Write the fraction in the boxes below the model.

**Read the fraction and use the word "and" when reading the whole number and the fractional part of the whole number.** *(one and seven-tenths)*

**Write a *decimal* for the fraction 1 and $\frac{7}{10}$ using the place value chart.**

**What number do we write in the tenths place?** *(7)* **Write it.**

**Why 7 in the tenths place?** *(seven-tenths are shaded or 7 of 10 parts are shaded)*

**7 is written in the tenths place because seven-tenths are shaded.**

**1 whole is shaded. Where do you write 1 in the place value chart?** *(in the ones place)* **Write "1" in the place value chart.**

**Why 1?** *(because 1 whole is shaded)*

**Read the *decimal* the same way as a fraction.** *(one and seven-tenths)*

2. Students will model, read, and write decimals in the context of a word problem.

Have students turn to *Modeled Practice Sheet #2*. The teacher and students will complete the steps as the lesson progresses.

**Say:** **Read the problem. Ready, read: "Ernesto has some pictures printed on shaded paper. What part of his pictures is printed on shaded paper?"**

**How many pictures are there in all?** *(10)*

**Does 10 represent the numerator or denominator in the fraction?** *(the denominator)*

**Why the denominator?** *(because there are 10 total equal parts)*
**Write "10" in the denominator position.**

**How many pictures are printed on shaded paper?** *(5)*

**Does 5 represent the numerator or denominator in the fraction?** *(the numerator)*

**Why the numerator?** *(because 5 of 10 pictures are printed on shaded paper)* **Write "5" in the numerator position.**

**What fraction names the part of the group of pictures that is printed on shaded paper?** *(* $\frac{5}{10}$ *)*

**The fraction** $\frac{5}{10}$ **can also be written as a** *decimal.*

**Find the tenths place on the place value chart.**

**What number will you write in the tenths place in the** *decimal?* *(5)*

**Why 5?** *(the numerator is 5 in the fraction or five-tenths are shaded)* **Write it.**

**Is there a whole number in the fraction** $\frac{5}{10}$ **?** *(no)*

**What do you write in the ones place when there is no whole number?** *(0)* **We write 0 when there is no whole number. Write it.**

**Read the** *decimal.* *(five-tenths)*

## Practice                                                      Time: 8 min

Activity 1: Students will model, read, and write fractions and decimals. Have students turn to the *Practice Sheets* on pages 47 and 48. Students will work with a math partner to complete the activity.

**Say:**    **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- How many equal parts?

- How many shaded parts?

- What number is written in the tenths place?

- What number is written in the ones place?

Activity 2: Using the *Practice Sheets* on pages 49 and 50, students will work with a math partner to write the fraction and decimal for the shaded model. Students will then take turns reading the decimals correctly.

**Say:** **With your math partner write the fraction and the decimal for the shaded portion of each model. Then take turns with your partner reading the fraction and the decimal for each model.**

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and complete as many items as possible.

**Say:** **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 8

# Decimals to the Hundredths

| Lesson Objectives | • The student will use place value to read and write decimals and fractions related to tenths and hundredths.<br>• The student will use pictorial models to relate decimals and fractions that name the tenths and hundredths.<br>• The student will use vocabulary related to fractions and decimals to express mathematical ideas precisely. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, decimal point, hundredths, tenths, numerator, denominator | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 107 – 126)<br><br>• Whiteboard with marker<br><br>• Base-10 materials: 2 wholes, 10 tenths, 10 hundredths | • Student Booklet (pp. 54 – 63)<br><br>• Whiteboard with marker (1 per student)<br><br>• Base-10 materials: 2 wholes, 10 tenths, 10 hundredths (1 set per student pair) |

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## Preview

**Say:** **Today we will discuss the relationship between fractions and decimals. We will read and write decimals to the hundredths place.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students review modeling decimals and fractions with base-10 materials such as $\frac{5}{10}$, $\frac{9}{10}$, $1\frac{7}{10}$, and $1\frac{3}{10}$, on top of 1 whole. The students will write the fraction and decimal using the whiteboard and marker.

Ask questions and give instructions such as:

- What is the fraction?

- Count the tenths. How many tenths?

- How many wholes?

- In the fraction, what is the numerator/denominator?

- Read the decimal number. What number is the tenths place? Ones place?

## Modeled Practice                                    Time: 8 min

1. Students will model, read, and write fractions and decimals.

    Have students turn to *Modeled Practice Sheet #1*. The teacher and students will complete the steps together as the lesson progresses.

    Place the base-10 whole and 1 hundredth on top of the 1 whole on the table.

**Say:** **How many hundredths are in 1 whole?** *(100)*

   **There are one hundred hundredths in 1 whole.**

   **How many hundredths are in the fraction $\frac{9}{100}$?** *(9)*

    Put 8 more hundredths on top of the 1 whole.

**Say:**  Shade $\frac{9}{100}$ of the model.

**What is the numerator?** *(9)* **What is the denominator?** *(100)*

**The fraction $\frac{9}{100}$ can also be written as a decimal. Decimals are a way to write fractions with denominators of 10 and 100.**

**Look at the place value chart. What place value is to the left of the decimal point?** *(ones)* **How many ones are in the nine-hundredths?** *(0)*

**We must write the 0 in the ones place to represent that are 0 whole numbers. Write 0 in the ones place.**

**The number to the left of the decimal point represents ones.**

**What place value is to the right of the decimal point?** *(tenths)*

---

### Teacher Note

Listen closely for students to pronounce the "-ths" in tenths and hundredths. Correct students if it is pronounced "tens."

---

**Say:**  **The number to the right of the decimal point represents 10 parts of a whole, or tenths. How many tenths are in the nine-hundredths?** *(0)*

**We must write the 0 in the tenths place to represent that are 0 tenths. Write 0 in the tenths place.**

**The place value to the right of the tenths is the hundredths.**

**What is to the right of the tenths?** *(hundredths)*

**The hundredths place represents 100 parts of a whole.**

**In the decimal, what number will we write in the hundredths place?** *(9)*

**Why 9?** *(because 9 of 100 parts are shaded or nine-hundredths is shaded)*

**Write 9 in the hundredths place because 9 of 100 parts are shaded, or nine-hundredths is shaded.**

Write "204" on the whiteboard.

**Say:** **Think about the number 204. How many digits are in 204?** *(3)*

**There are 3 digits. Do we have to write a 0 in the tens place?** *(yes)*

**Why?** *(to show that there are no tens)*

**We write a 0 in the tens place to show there are no tens in the number 204. If we do not write 0, then the number would be 24.**

**Now go back to writing the fraction $\frac{9}{100}$ as a decimal on your sheet. What do we write in the tenths place?** *(0)* **Why?** *(there are no tenths)*

**What number do we write in the ones place?** *(0)*

**Why 0?** *(because there are no ones)*

**Read the decimal the same way as the fraction. The ending "-ths" means the numbers go on the right side of the decimal. Read it.** *(nine-hundredths)*

**Write the fraction of the next shaded model.** *( $\frac{28}{100}$ )*

**How many hundredths are shaded?** *(twenty-eight hundredths)*

**In the fraction what is the denominator?** *(100)* **Numerator?** *(28)*

Put 2 tenths and 8 hundredths on the table.

**Say:** **Here is another way to make twenty-eight hundredths. Instead of twenty-eight hundredths we can trade ten-hundredths for one-tenth.**

**How many tenths are there?** *(2)*

**There are two-tenths.**

Touch each tenth as you count.

**Say:**  **Two-tenths is the same as twenty-hundredths. Ready, count: 10 hundredths, 20 hundredths.**

**Two-tenths plus eight-hundredths is the same as twenty-eight hundredths.**

**Now write the decimal by tenths and hundredths. How many tenths are in twenty-eight hundredths?** *(2)*

**Write 2 in the tenths place.**

**How many hundredths?** *(8)*

**Write 8 in the hundredths place.**

**What number do we write in the ones place?** *(0)*

**Why zero?** *(there are no ones)*

**Read the decimal number.** *(twenty-eight hundredths)*

2.  Students will model, read, and write fractions and decimals.

Use *Modeled Practice Sheet #2*.

**Say:**  **How is this model different from the last 2?** *(there is 1 whole shaded)*

**There is 1 whole shaded. Write 1 in the box on the left.**

**Write a fraction for the partially shaded model.**

**How many hundredths are shaded?** *(15)*

**In the fraction what is the numerator?** *(15)* **The denominator?** *(100)* **Write the fraction.**

**When reading a fraction with the whole shaded, use the word "and." Read it.** *(one and fifteen-hundredths)*

**Now we will write the fraction 1 and $\frac{15}{100}$ as a decimal.**

Place 1 whole, 1 tenth, and 5 hundredths on the table.

Say: **Here is a model of 1 and $\frac{15}{100}$ similar to the shaded model.**

**We have 1 whole. What number do we write in the ones place in the decimal?** *(1)* **Write it.**

**How many tenths are there?** *(1)*

**Write "1" in the tenths place.**

**How many hundredths?** *(5)*

**Write "5" in the hundredths place.**

**The decimal number is read the same way as the fraction. Say "and" when you read the decimal point. Read the decimal number.** *(one and fifteen-hundredths)*

## Practice                                         Time: 8 min

Activity 1: Students will model, read, and write fractions and decimals. Have students turn to the *Practice Sheets* on pages 56 and 57. Students will work with a math partner to complete the activity.

Say: **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- How many shaded parts?

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- What number is written in the hundredths place? Tenths place? Ones place?

- Is the decimal number read the same way as the fraction?

Activity 2: Students will write the fraction and decimal for the shaded model in pairs. Then students will take turns reading the decimals correctly. Use the *Practice Sheets* on pages 58 and 59.

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:      You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**Module: Fraction and Decimal Relationships**
Lesson 9

# Decomposing Decimals

| Lesson Objectives | • The student will decompose decimals into ones, tenths, and hundredths using base-10 materials and a place value mat.<br>• The student will create and use representations to organize, record, and communicate mathematical ideas. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, tenths, hundredths, expanded form | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 127 – 136)<br><br>• Base-10 materials: 10 wholes, 10 tenths, 10 hundredths<br><br>• Dry erase marker<br><br>• Place Value Chart | • Student Booklet (pp. 64 – 68)<br><br>• Base-10 materials: 5 wholes, 9 tenths, 9 hundredths (1 set per student)<br><br>• Dry erase marker (1 per student)<br><br>• Place Value Chart (1 per student)<br><br>• *Matching* Cards: Decimals (8 cards per student pair) |

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## Preview

**Say:** **Today we will use our knowledge of place value to expand numbers into ones, tenths, and hundredths.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students complete the *Engaged Practice Sheet* to practice reading decimals and writing whole numbers in expanded form.

When reading decimals, ask students:

- What is the unit: tenths or hundredths?

- How many _____ [ones, tenths, hundredths]?

When decomposing numbers, ask questions such as:

- What is the number?

- How many thousands? Hundreds? Tens? Ones?

- What does the expanded form look like?

## Modeled Practice                                   Time: 8 min

1. Students will decompose 2.4 using the base-10 materials. Distribute a *Place Value Chart* and marker to each student. The teacher and students will complete the steps together as the lesson progresses.

**Say:** **This place value chart can be used to break apart or expand each part of a decimal. Read the place value at the top of the chart.** *(ones, tenths, hundredths)*

**What math symbol separates the ones and tenths place?** *(the decimal point)*

**The decimal point separates the ones from the tenths and hundredths place.**

Write "2.4" on the Place Value Chart. Use the base-10 materials.

**Say:** **Read the number using the word "and" for the decimal point.**
*(two and four-tenths)*

**Write the decimal 2.4 on your place value chart using your marker.**

Use the base-10 materials to build the decimal 2.4.

**Say:** **Now we are going to build the decimal 2.4. How many wholes or ones are in 2.4?** *(2 wholes or ones)*

**2 is in the ones place to the left of the decimal point. Put 2 ones or wholes in the ones column on the chart.**

Place the 2 wholes on the chart while students do the same.

| Teacher Note |
|---|
| When students respond to a question about the number of ones, tenths, or hundredths, make sure they give the unit as well as the number. For example, when asked, "How many tenths?" students should respond with "4 *tenths*." |

**Say:** **Count the ones. 1, 2. We have 2 ones.**

**What number is in the tenths place?** *(4)*

**Put 4 tenths on the chart.**

**Count the tenths. One-tenth, two-tenths … four-tenths.**

**Now we will write a sentence that breaks apart or expands each part of the decimal 2.4.**

**Start in the ones place. How many wholes or ones are there?** *(2)* **Write "2.0" on the line followed by a plus sign.**

**How many tenths are there?** *(4 tenths)*

**How do you write it in decimal form?** *(0 in the ones place and four in the tenths place)*

**We write 0 in the ones place and 4 in the tenths place. Write it after the plus sign.**

| Teacher Note |
| --- |
| Some students may have seen a decimal written as .4 instead of 0.4. The 0 is a convention that makes the decimal point prominent in front of the 4 and indicates that there are no whole numbers. |

Write "0.4" on the line.

**Say:** **Read the number sentence.** *(two plus four-tenths)*

**The expanded form of 2.4 is 2.0 + 0.4.**

2. Students will decompose 2.45 using the base-10 materials. Continue using the *Place Value Chart* and marker.

**Say:** **Write "5" in the hundredths column. Read the decimal.** *(two and forty-five hundredths)*

**What did we add?** *(five-hundredths)*

**We added five-hundredths to two and four-tenths.**

**Put 5 hundredths in the hundredths column.**

**Count the hundredths. Ready, count: One-hundredth, two-hundredths … five-hundredths.**

**Now we will add to the expanded form of 2.4 on the line.**

**How do you write five-hundredths in decimal form?** *(0 in the ones place, 0 in the tenths place, 5 in the hundredths place)*

**We can write 0 in the ones place to remind us we are in the decimal form of the number. We have to write 0 in the tenths place because the tenths place has no value, and 5 in the hundredths place. Write "+ 0.05" on the line.**

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**The sentence shows the expanded form of 2.45. Read the sentence.** *(two plus four-tenths plus five-hundredths)*

3. Write the expanded form for 8.36.

   Have students turn to the *Modeled Practice Sheet* in their Student Booklet. The teacher and students will complete the steps together as the lesson progresses.

**Say:** **Read the decimal.** *(eight and thirty-six hundredths)*

   **We are going to write eight and thirty-six hundredths in expanded form.**

   **First, write the decimal in the correct place value on the chart.**

   Write the numbers in the *Place Value Chart* while the students do the same. Check their work.

**Say:** **What digit is in the ones place?** *(8)* **What will we write for 8 ones in expanded form?** *(8.0)* **Write it.**

   **Tenths place?** *(3)* **What will we write for 3 tenths in expanded form?** *(0.3)* **Write it.**

   **Hundredths place?** *(6)* **What will we write for 6 hundredths in expanded form?** *(0.06)* **Write it.**

   **Read the expanded form.** *(eight plus three-tenths plus six-hundredths)*

## Practice                                                    Time: 8 min

Activity 1: Students will practice writing decimals in expanded form. Have students turn to the *Practice Sheet* on page 66. Students will work with a math partner to complete the activity.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- How many ones? Tenths? Hundredths?

- What does the expanded form look like?

Activity 2: In pairs, students will play a matching game similar to Go Fish. Each student pair will get 8 *Matching Cards: Decimals* (4 cards each). Students will match the number in standard form to the expanded form.

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

   **Say:     You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 10

# Fractions and Decimals on the Number Line

| Lesson Objectives | • The student will write fractions and decimals on a number line. <br> • The student will read fractions and decimals to the tenths place. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | number line, decimal, hundredths, tenths, numerator, denominator, range | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 137 – 148) | • Student Booklet (pp. 69 – 74) <br> • Fractions and Decimals Mat (1 per student) <br> • Dry erase marker |

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## Preview

**Say:**   **Today we will write fractions and decimals on the number line.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students review modeling, reading, and writing fractions and decimals. Students will use the *Fractions and Decimals Mat* and dry erase marker to shade $\frac{5}{10}$ and $\frac{16}{100}$. Then students will write the fraction and decimal to represent each model.

Ask questions and give directions such as:

- How many tenths/hundredths are shaded?

- What is the fraction?

- In the fraction, what is the numerator/denominator?

- How do you write the decimal number?

- What number is in the ones place? Tenths place? Hundredths place?

- Are fractions and decimals read the same way?

- Read the decimal number.

## Modeled Practice                                    Time: 8 min

1. Students will write fractions and decimals less than 1 on the number line.

   Have students turn to *Modeled Practice Sheet #1* in their Student Booklets. The teacher and students will complete the steps together as the lesson progresses.

**Say:**   **Look at the number line. Every number line has a range, a start point and end point that are part of a larger number line. What is the range for this number line?** *(0 to 1)*

   **The range is 0 to 1.0.**

**The space between 0 and 1.0 is divided into smaller equal parts. To find the number of parts count each part by touching the space between the hash marks.**

Check students are counting the space between the hash marks.

**Say:** **How many parts?** *(10)*

**The number line is divided into 10 equal parts.**

**What is the fractional name of each part?** *(one-tenth)*

**Each part is $\frac{1}{10}$.**

**Count the fractional parts by counting the units after 0. Ready, count: One-tenth, two-tenths … ten-tenths. It is $\frac{10}{10}$ or 1 whole.**

**Write the fraction $\frac{1}{10}$ in the first box above the number line after 0.**

Check students' work.

**Say:** **The fraction $\frac{1}{10}$ can also be written as a decimal on the number line. How do you write the fraction $\frac{1}{10}$ as a decimal?** *(0 in the ones place and 1 in the tenths place)*

**We write 0 in the ones place and 1 in the tenths place. Write it in the box below the fraction $\frac{1}{10}$ on the number line.**

Check students' work.

**Say:** **What tenth is after $\frac{1}{10}$?** *( $\frac{2}{10}$ )*

**Write the fraction $\frac{2}{10}$ in the top box. What is the denominator?** *(10)* **Numerator?** *(2)*

**How do you write the fraction $\frac{2}{10}$ as a decimal?** *(0 in the ones place and 2 in the tenths place)*

**We write 0 in the ones place and 2 in the tenths place. Write the decimal in the bottom box.**

**Why can't I write 0.02?** *(the number line is divided into 10 parts, each part is one-tenth, not one-hundredths)*

**The number line is divided into tenths, not hundredths.**

**What fraction comes next on this number line divided into tenths?** *( $\frac{3}{10}$ )*

**Write $\frac{3}{10}$ in the top box.**

**How do you write $\frac{3}{10}$ as a decimal?** *(0 in the ones place and 3 in the tenths place)* **Write it.**

**Write the rest of the missing fractions and decimals in the empty boxes on the number line.**

Check students' work. Tell the students to practice reading the fractions on the number line in pairs.

**Say:**   **Find the decimal 0.9 on the number line. Why is 1 whole after 0.9 instead of 0.10?** *( $\frac{10}{10}$ is equivalent to 1 whole, the number line is divided into tenths not hundredths, adding one-tenth to nine-tenths does not equal 0.10, 0.10 is less than 0.9)*

**1 is after 0.9 because $\frac{10}{10}$ is equivalent to 1 whole.**

2. Students will write fractions and decimals greater than 1 on the number line.

Have students turn to *Modeled Practice Sheet #2*. The teacher and students will complete the steps together as the lesson progresses.

**Say:**   **In the last model we wrote fractions and decimals from 0 to 1 on the number line. What is the range on this number line?** *(0 to 2)*

**The range is 0 to 2.0 wholes. How many equal parts are between 0 and 1.0?** *(10)*

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**There are 10 equal parts between 0 and 1.0.**

**How many equal parts are between 1.0 and 2.0?** *(10)*

**There are 10 equal parts. What is the fractional name of each part?** *(one-tenth)*

**If each part is $\frac{1}{10}$, then what is the fraction after 1.0?** *(1 and $\frac{1}{10}$)*

**The fraction after 1.0 is 1 and $\frac{1}{10}$. We say the word "and" between the whole number and the fraction.**

**How is this similar to reading a decimal?** *(we also read the decimal point as "and" )*

**Write the fraction 1 and $\frac{1}{10}$ in the top box. The whole number 1 is written to the left of the fraction $\frac{1}{10}$.**

Check students' work.

| **Teacher Note** |
| --- |
| Use the word "and" when reading mixed numbers to designate the whole and the fraction. |

**Say:**    **1 and $\frac{1}{10}$ can also be written as a decimal.**

**What number do we write in the ones place?** *(1)*

**We write 1 in the ones place.**

**What number do we write in the tenths place?** *(1)* **We write 1 in the tenths place.**

**Write the decimal 1.1 in the bottom box.**

Check students' work.

**Say:**    **Read the decimal.** *(one and one-tenth)*

**Look at the number line. The next fraction and decimal are already written. Read the fraction and decimal after 1 and $\frac{1}{10}$.** *(1 and $\frac{2}{10}$)*

**What fraction and decimal is after 1 and $\frac{2}{10}$?** *(1 and $\frac{3}{10}$)*

**Write the fraction 1 and $\frac{3}{10}$ in the top box.**

Check students' work.

**Say:** **How do you write the fraction 1 and $\frac{3}{10}$ as a decimal?** *(1 in the ones place and 3 in the tenths place)*

**We write 1 in the ones place and 3 in the tenths place. Write the decimal in the bottom box.**

Check students' work.

**Say:** **Write the rest of the fractions and decimals in the empty boxes on the number line.**

Tell the students to practice reading the fractions on the number line in pairs.

**Say:** **What decimal represents point D?** *(1.7)*

**Point D is represented by the decimal 1.7.**

## Practice                                                 Time: 8 min

Activity 1: Students will model, read, and write fractions and decimals on the number line. Have students turn to the *Practice Sheet* on page 71. Students will work with a math partner to complete the activity.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

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Ask questions such as:

- How many parts are between 0 and 1 on the number line? How do you know? *(count the space between, not the hash marks)*

- What is the fractional name of each part? How do you know? *(that is how the number line is broken into parts)*

- How do you write the fraction $\frac{1}{10}$ as a decimal? *(0.1)*

- What fraction represents point K? $(\frac{5}{10})$ Point M? $(\frac{3}{10})$ Point N? $(\frac{8}{10})$

- In the first number line what fraction is after $\frac{5}{10}$? $(\frac{6}{10})$

- Is the decimal read the same way as the fraction? *(yes)*

- What decimal represents point C? *(1.7)* Point A? *(1.3)* Point B? *(1.9)*

Activity 2: Students will write the missing fractions and decimals on the number line in pairs. Use the *Practice Sheet* on page 72.

## Independent Practice                                        Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:**    **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**Module: Fraction and Decimal Relationships**
Lesson 11

# Fractions and Decimals on the Number Line

| **Lesson Objectives** | • The student will write fractions and decimals on a number line.<br>• The student will use vocabulary related to fractions and decimals to express mathematical ideas precisely. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, denominator, hundredths, number line, numerator, range, tenths | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 149 – 158) | • Student Booklet (pp. 75 – 79)<br>• *Constructing a Number Line* Cards |

## Preview

**Say:** **Today we will continue to practice writing fractions and decimals on the number line.**

## Engage Prior/Informal Knowledge　　　　　Time: 3 min

Have students review modeling, reading, and writing fractions and decimals using the *Engaged Practice Sheet*. Students will write the fraction and decimals for $\frac{9}{10}$ and $1\frac{6}{10}$. Then use a point to represent the fractions and decimals on a number line.

Ask questions such as:

- How many tenths are shaded? How many wholes? *(answers will vary)*

- Read the fraction/decimal.

- In the fraction, what is the whole? Numerator? Denominator? *(answers will vary)*

- How many equal parts are between 0-1? Between 1-2? *(answers will vary)*

- What is the fractional name of each part? *(answers will vary)*

- What is $\frac{10}{10}$ equivalent to? *(1 whole)*

- How do you write the fraction as a decimal? *(answers will vary)*

- What digits is in the ones place? Tenths place? *(answers will vary)*

- Are fractions and decimals read the same way?

## Modeled Practice                                    Time: 8 min

1. Students will write fractions and decimals greater than 2 on the number line.

   Have students turn to the *Modeled Practice Sheet*. The teacher and students will complete the steps together as the lesson progresses.

**Say:**    **In the last lesson we wrote fractions and decimals on the number line that ranged from 0 to 1 and 0 to 2. How is the number line here different?** *(the number lines goes from 6 to 8, the number line does not start at 0)*

**This number line represents a range that does not start at zero. Instead this number line starts at 6. What is the range on this number line?** *(6 to 8)*

**The range is 6.0 to 8.0.**

**How many equal parts are between 6 and 7?** *(10)*

**From 7 and 8?** *(10)*

**How do you know?** *(count the spaces between the hash marks)*

**From 6 to 7, it is divided into 10 parts. From 7 to 8 it is also divided into 10 parts.**

**What is the fractional name of each part?** *(one-tenth)*

**How do we count the parts when there is a whole number and a fraction?** *(say the whole number and the fraction)*

Put your finger on the hash mark and count.

| Teacher Note |
|---|
| Use the word "and" when reading mixed numbers. |

**Say:**　**Count this section of the number line from 6 to 7. Ready, count: 6 and $\frac{1}{10}$, 6 and $\frac{2}{10}$ … 7.**

**What fraction represents point H?** *(6 and $\frac{1}{10}$)*

**Point H represents 6 and $\frac{1}{10}$. What is the whole number?** *(6)* **Write the fraction in the box above the number line.**

**How do you write the fraction 6 and $\frac{1}{10}$ as a decimal?** *(6 in the ones place and 1 in the tenths place)*

**6 is written in the ones place and 1 is written in the tenths place after the decimal point. Write it in the box below the number line.**

**The place value of the 1 in the tenths place shows the number line is divided into 10 equal parts.**

**When reading a decimal number, what do you use for the decimal point?** *(the word "and")*

**Read it.** *(six and one-tenth)*

**What fraction and decimal represent point M on the number line?** *(6 and $\frac{4}{10}$)*

**Ready, count: 6 and $\frac{1}{10}$, 6 and $\frac{2}{10}$ … 6 and $\frac{4}{10}$.**

**Write the fraction 6 and $\frac{4}{10}$.**

**In the fraction, what is the whole?** *(6)* **The numerator?** *(4)* **Denominator?** *(10)*

**How do you write the fraction as a decimal?** *(6 in the ones place and 4 in the tenths place)*

**6 is written in the ones place and 4 is written in the tenths place. Write it.**

**Read it.** *(six and four-tenths)*

**What fraction and decimal represent point P?** *(6 and $\frac{8}{10}$)*

**Write the fraction and decimal in the boxes.**

**In the fraction, what is the whole?** *(6)* **The numerator?** *(8)* **Denominator?** *(10)*

**How do you write the fraction as a decimal?** *(6 in the ones place and 8 in the tenths place)*

**Read it.** *(six and eight-tenths)*

**Write the last two sets of fractions and decimals in the empty boxes.**

Tell the students to practice reading the fractions on the number line in pairs.

**Say:**　**How do you find the fraction that represents point T?** *(count by the whole and tenths)*

**Ready, count: 7 and $\frac{1}{10}$, 7 and $\frac{2}{10}$, 7 and $\frac{3}{10}$.**

**Point T represents 7 and $\frac{3}{10}$.**

**How do you write the fraction 7 and $\frac{3}{10}$?** *(7 in the whole, 3 in the numerator, 10 in the denominator)*

**How do you write the fraction as a decimal?** *(7 in the ones place, 3 in the tenths place)*

**What fraction and decimal represent point V?** *(7 and $\frac{7}{10}$)*

**In the fraction, what is the whole?** *(7)* **The numerator?** *(7)* **Denominator?** *(10)*

**How do you write the decimal as a fraction?** *(7 in the whole, 7 in the tenths place)*

## Practice

**Time: 8 min**

Activity 1: Students will write fractions and decimals greater than 2 on the number line. Have students turn to the *Practice Sheet* on page 77. Students will work with a math partner to complete the activity.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- How many parts are between 5 and 6? *(10)* From 6 to 7? *(10)*

- What is the fractional name of each part? *(one-tenth)*

- What fraction represents point W? *(5 $\frac{5}{10}$)* X? *(5 $\frac{8}{10}$)* Y? *(6 $\frac{5}{10}$)*

- Is the decimal number read the same way as the fraction? *(yes)* Why?

- What decimal represents point A? *(3.2)* B? *(3.6)* C? *(4.5)*

Activity 2: Using the *Constructing a Number Line Cards*, students will work together to construct a number line using fractions and decimals on the table. Students will take turns drawing a card before putting the card in the correct place on the number line.

## Independent Practice                                Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:** **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 12

# Equivalent Decimals

| Lesson Objectives | • The student will compare two decimals.<br>• The student will read and write equivalent decimals.<br>• The student will use vocabulary related to fractions and decimals to express mathematical ideas precisely. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, decimal point, equal sign, equivalent, hundredths, tenths | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 159 - 170)<br><br>• Fractions and Decimals Mat<br><br>• Dry erase marker | • Student Booklet (pp. 80 – 85)<br><br>• Fractions and Decimals Mat (1 per student)<br><br>• Dry erase marker (1 per student) |

**ESTAR** INTERVENTION

## Preview

**Say:** **Today we will read and write equivalent decimals.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students review writing decimals on the number line using the *Engaged Practice Sheet.*

**Say:** **Write the decimal for each blank box on the number line.**

Ask questions such as:

- What is the range on this number line? *(3 to 5)*

- How many equal parts between 3 and 4? *(10)* Between 4 and 5? *(10)*

- What is the fractional name of each part? *(one-tenth)*

- How do you write the fraction $\frac{1}{10}$ as a decimal? *(0.1)*

- What decimal does the first box represent? *(3.1)*

- How do you write 3 and $\frac{1}{10}$ as a decimal? *(3 in the ones place and 1 in the tenths place)*

- What decimal would go in the box after 4.5? *(4.6)*

- What decimal represents point Q? *(3.3)* Point P? *(3.7)* Point O? *(4.8)*

## Modeled Practice                                    Time: 8 min

1. Students will read and write equivalent decimals using the tenths and hundredths model.

   Use the *Fractions and Decimals Mat* and dry erase marker to model. Students will work along with the teacher using their *Fractions and Decimals Mat.*

**Say:** **How are the models similar?** *(they are the same size or represent 1 whole)*

**Both models are the same size and represent 1 whole.**

**How are the models different?** *(one is divided into 10 parts or tenths and the other is 100 parts or hundredths)*

**The difference between the models is that each tenth in the model on the left is divided into 10 smaller parts in the model on the right.**

**Quickly shade $\frac{3}{10}$ on the tenths model.**

**How many tenths are shaded?** *(three-tenths)*

**Write the fraction $\frac{3}{10}$ as a decimal on the line.**

**What number is in the ones place?** *(0)* **Why 0?** *(no whole or ones)*

**What number is in the tenths place?** *(3)*

**Where do we place the decimal point?** *(before the 3, between the 0 and the 3)*

**Read the decimal.** *(three-tenths)*

**We are now going to shade 3 tenths, the same amount, on the hundreds model. How do we know where to shade?** *(allow a variety of answers: shade 3 columns and ignore the hundredths divisions)*

**Shade the same amount on the hundredths model.**

**When the same amount is shaded on the hundredths model, we have changed how many parts there are in 3 tenths.**

**Count each column by ten-hundredths. Ready, count: Ten-hundredths, twenty-hundredths, thirty-hundredths.**

**How many shaded hundredths?** *(thirty-hundredths)*

**Thirty-hundredths is equivalent to three-tenths.**

**Write the decimal 0.30 on the line.**

**What 2 numbers is the decimal point between?** *(zero and three)*

**What number is in the ones place?** *(0)*

**Tenths place?** *(3)*

**Hundredths place?** *(0)*

**Read the decimal.** *(thirty-hundredths)*

**Describe the shaded amounts.** *(they are the same or equivalent, they equal the same amount)*

**The shaded amounts are equivalent. They equal the same amount.**

**If you put the tenths model on top of the hundredths model, what would it look like?** *(the same amount would be shaded on both models)*

**What symbol can we use to show the same as?** *(the equal sign)*

**Write an equal sign between the decimals.**

**Three-tenths is equal to thirty-hundredths.**

**What is the difference between the 2 decimals?** *(the way the decimals are written and read)*

**The difference is how the two decimals are written and read.**

2. Students will read and write equivalent decimals.

   Continue to use the *Fractions and Decimals Mat*. Write "0.7" and "0.70" on the line. Tell students to erase their previous work on the mat.

**Say:**  **Read the first decimal.** *(seven-tenths)* **Write the decimal on the line.**

**Read the second decimal.** *(seventy-hundredths)* **Write it.**

**Shade both decimals on your mat.**

**What do you notice about the shaded models?** *(the amounts are the same or equivalent)*

**How many tenths are shaded?** *(seven-tenths)*

**Seven-tenths are shaded.**

**How many hundredths are shaded?** *(seventy-hundredths)*

**Seventy-hundredths are shaded.**

**Describe the shaded amounts.** *(they are the same or equivalent)*

**The shaded amounts are equivalent.**

**What symbol can we use to show the same as?** *(the equal sign)*

**Write an equal sign between the decimals.**

**Read it.** *(seven-tenths is equal to seventy-hundredths)*

**What is the difference between the two decimals?** *(the way the decimals are written and read)*

Erase the work on the mat and tell students to do the same.

Say: **Shade 3 hundredths on the hundredths model.**

   **Can you shade 3 tenths on the tenths model to represent 3 hundredths?** *(no)*

   **Why not?** *(they are not the same or equivalent)*

   **The same amount cannot be shaded on the tenths model because three-hundredths is not equivalent to three-tenths.**

## Practice                                                                    Time: 8 min

Activity 1: Students will read and write equivalent decimals. Have students turn to *Practice Sheet* on page 81. Students will work with a math partner to complete the activity.

**Say:**   **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- How do you say the decimal number? *(answers will vary)*

- How do you write the decimal number? *(answers will vary)*

- What 2 whole numbers is the decimal between? *(answers will vary)*

- Describe the shaded amounts.

- Are the amounts equivalent? How do you know? *(answers will vary)*

Activity 2: In pairs, students will write decimal numbers for the shaded models. Use *Practice Sheet* on page 82.

## Independent Practice                                        Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:**     **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 13

# Comparing Fractions and Decimals

| Lesson Objectives | • The student will compare fractions and decimals to the hundredths.<br>• The student will read and write fractions and decimals.<br>• The student will use vocabulary related to fractions and decimals to express mathematical ideas precisely. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, decimal point, denominator, equal sign =, equivalent, greater than symbol >, hundredths, less than symbol <, numerator, tenths | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 171 – 192)<br><br>• Fractions and Decimals Mat<br><br>• Dry erase marker | • Student Booklet (pp. 86 - 96)<br><br>• Fractions and Decimals Mat (1 per student)<br><br>• Dry erase marker (1 per student) |

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## Preview

**Say:** **Today we will compare fractions and decimals using the greater than and less than symbols.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students review modeling, reading, and writing equivalent fractions and decimals using the *Fractions and Decimals Mat* and dry erase marker. Have students shade $\frac{2}{10}$ and $\frac{20}{100}$.

Ask questions and give directions such as:

- How are the models similar? *(they are the same size or represent 1 whole)*

- How are the models different? *(1 is divided into 10 parts or tenths and the other 100 parts or hundredths)*

- How many hundredths are in each column or row? *(10)*

- Describe the shaded amounts. *(they are the same or equivalent)*

- Write the fraction and decimal for the shaded models. *($\frac{2}{10}$ and 0.2, $\frac{20}{100}$ and 0.20)*

- What is the numerator for the first fraction? *(2)* For the second fraction? *(20)*

- What is the denominator for the first fraction? *(10)* For the second fraction? *(100)*

- In the decimal 0.20, what number is in the ones place? *(0)* Tenths place? *(2)* Hundredths place? *(0)*

- What does "equivalent" mean? *(they are the same)*

- Are the fractions and decimals here equivalent? *(yes)* How do you know? *(the shaded amounts are the same)*

- What sign do we use to show they are equivalent? *(the equal sign)*

If time permits, tell students to shade and write another equivalent fraction and decimal.

## Modeled Practice                                    Time: 8 min

1. Students will compare fractions and decimals to the hundredths.

   Have student turn to *Modeled Practice #1*. Students will work along with the teacher.

   **Say:**   **We are going to compare fractions and decimals using the greater than and less than symbol.**

   Point at the greater than > symbol.

   **Say:**   **If the value is greater than another, we use the greater than symbol.**

   Point at the less than < symbol.

   **Say:**   **If the value is less than another, we use the less than symbol.**

   **Compare $\frac{1}{10}$ and $\frac{2}{10}$. Is $\frac{1}{10}$ greater than or less than $\frac{2}{10}$?** *(less than $\frac{2}{10}$)*

   **$\frac{1}{10}$ is less than $\frac{2}{10}$. Write the less than symbol.**

   **Read the sentence.** *($\frac{1}{10}$ is less than $\frac{2}{10}$)*

   **Look at the next hundreds model under the line.**

   **Shade $\frac{60}{100}$ in the left hundredths model. Write the fraction.**

   **What is the numerator?** *(60)* **Denominator?** *(100)*

   **Shade $\frac{58}{100}$ in the right hundredths model. Write the fraction.**

   **What is the numerator?** *(58)* **Denominator?** *(100)*

   **Compare the shaded amounts. Which fraction is greater?** *($\frac{60}{100}$)*

Explain how you know $\frac{60}{100}$ is greater than $\frac{58}{100}$. *(more parts are shaded, the numerator 60 is greater than 58)*

We can see from the shaded amounts that $\frac{60}{100}$ is greater than $\frac{58}{100}$. Write the greater than symbol.

Now write the fractions as decimals. *(0.60, 0.58)*

We can use our knowledge about money to compare the decimals.

How many pennies are in 1 dollar? *(100 pennies)*

There are 100 pennies in 1 whole dollar. A penny is one-hundredth of a dollar. What is a penny? *(one-hundredth of 1 dollar)*

60 cents is the same as sixty-hundredths.

Fifty-eight hundredths is the same as how many cents? *(58 cents)*

Which is greater: 60 cents or 58 cents? *(60 cents)*

Sixty-hundredths is greater than fifty-eight hundredths. Write the greater than symbol.

Read the sentence. *(sixty-hundredths is greater than fifty-eight hundredths)*

2.  Students will compare a decimal to the tenths and a decimal to the hundredths.

Have students turn to the *Modeled Practice #2*. Students will work along with the teacher.

**Say:**    Read the decimals. *(five-tenths, forty-five hundredths)*

We are going to compare five-tenths and forty-five hundredths.

Write the decimals as fractions on the line.

**Quickly shade five-tenths and forty-five hundredths.**

**Compare the shaded amounts. Which is greater?** *(five-tenths)*

**How do you know?** *(more is shaded in five-tenths than forty-five hundredths)*

**We can see from the shaded amounts that five-tenths is greater than forty-five hundredths. Write the greater than symbol between the decimals and the fractions.**

**Read the sentence.** *(five-tenths is greater than forty-five hundredths)*

**Write a "0" in the hundredths place of the decimal "0.50."**

**We added a zero in the hundredths place to 0.50. Read the decimal.** *(fifty-hundredths)*

**The decimal is now 0.50. What do we know about 0.50 and 0.5?** *(they are the same)*

**0.5 and 0.50 are equivalent decimals. They represent the same amount.**

**Is 0.50 greater than 0.45?** *(yes)*

**0.50 and 0.5 are greater than 0.45.**

3. Students will compare a decimal to the tenths and a decimal to the hundredths.

   Have students turn to *Modeled Practice #3*. Students will work along with the teacher.

**Say:**   **Read the decimals in the next problem.** *(five-tenths and fifty-eight hundredths)*

**We are going to compare five-tenths and fifty-eight hundredths.**

**Quickly shade five-tenths and fifty-eight hundredths.**

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**Compare the shaded amounts. Is five-tenths greater than or less than fifty-eight hundredths?** *(five-tenths is less than fifty-eight hundredths)*

**How do you know?** *(less is shaded in five tenths)*

**We can see from the shaded amounts that five-tenths is less than fifty-eight hundredths. Write the less than symbol.**

**Read the sentence.** *(five-tenths is less than fifty-eight hundredths)*

## Practice
**Time: 8 min**

Activity 1: Students will compare fractions and decimals using the tenths and hundredths model. Have students turn to *Practice Sheets* on the pages 89 and 90. Students will work with a math partner to complete the activity.

**Say:**   **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- How do you say the decimal numbers? *(answers will vary)*

- How do you write the decimal numbers as fractions? *(answers will vary)*

- Describe the shaded amounts.

- Are the amounts equivalent? *(answers will vary)*

- Which is greater? *(answers will vary)*

- Read the sentence.

Activity 2: In pairs, students will write and compare fractions and decimals for the shaded amounts. Have students turn to *Practice Sheets* on pages 91 and 92.

## Independent Practice                           **Time: 6 min**

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:** **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 14

# Comparing Decimals

| Lesson Objectives | • The student will compare decimals involving tenths and hundredths.<br>• The student will read and write decimals.<br>• The student will use vocabulary related to fractions and decimals to express mathematical ideas precisely. |
|---|---|
| **Vocabulary** | **No new words are introduced.** |
| **Reviewed Vocabulary** | decimal, denominator, equal sign =, equivalent, hundredths, greater than symbol >, less than symbol <, numerator, tenths |
| **Instructional Materials** | **Teacher** | **Student** |

| Instructional Materials | Teacher | Student |
|---|---|---|
| | • Teacher Masters (pp. 193 – 210)<br><br>• Hundredths Mat<br><br>• Dry erase marker | • Student Booklet (pp. 97 – 105)<br><br>• Hundredths Mat (1 per student)<br><br>• Dry erase marker (1 per student)<br><br>• Fractions and Decimals Mat (1 per student) |

## Preview

**Say:** **Today we will compare decimals using the greater than and less than symbols.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students review comparing fractions and decimals using the *Hundredths Mat* and dry erase marker. Have students shade $\frac{34}{100}$ and $\frac{43}{100}$.

Ask questions and give directions such as:

- Write the decimals for the shaded models.

- What number is in the ones place? Tenths place? Hundredths place?

- Describe the shaded models.

- Is 0.34 greater than or less than 0.43? *(0.34 is less than 0.43)* How do you know? *(less amount is shaded)*

- Use the greater than, less than, or equal sign to compare.

- Read the sentence. *(0.34 < 0.43)*

If time permits, compare 0.54 and 0.64.

## Modeled Practice                                   Time: 8 min

1. Students will compare fractions and decimals using the tenths and hundredths models. Students will write >, <, or =.

   Have students turn to *Modeled Practice Sheet #1.* The teacher and students will complete the steps together as the lesson progresses.

   **Say:** **Read the decimals.** *(seven-tenths, sixty-nine hundredths)*

   **We are going to compare 0.7 and 0.69.**

| **Teacher Note** |
| --- |
| Read the decimal 0.7 as "seven-tenths" rather than "point seven." Read all decimals in the lesson using place value language. |

**Quickly shade 0.7 and 0.69.**

**Compare the shaded amounts. Are they equivalent?** *(no)*

**Which is greater?** *(0.7)*

**How do you know?** *(more is shaded in 0.7 than 0.69)*

**We can see from the shaded amounts that 0.7 is greater than 0.69. Write the greater than symbol.**

**Read the sentence together. Ready, read: seven tenths is greater than sixty-nine hundredths.**

2. Students will compare fractions and decimals using the tenths and hundredths models. Students will write >, <, or =.

   Students will use *Modeled Practice Sheet #2.* The teacher and students will complete the steps together as the lesson progresses.

**Say:** **Read the decimals in the next problem.** *(forty-six hundredths and four-tenths)*

**We are going to compare 0.46 and 0.4.**

**Shade 0.46 and 0.4.**

**Describe the shaded amounts.** *(more is shaded than the other, there is less shaded than the other)*

**Compare. Which is greater?** *(forty-six hundredths)*

**We can see from the shaded amounts that forty-six hundredths is greater than four-tenths. Write the greater than symbol.**

**Read the sentence together. Ready, read: "forty-six hundredths is greater than four tenths."**

3. Students will compare fractions and decimals using the tenths and hundredths models. Students will write >, <, or =.

   Students will use *Modeled Practice Sheet #3.* Continue to work together as a group.

**Say:**   **Read the decimals.** *(three-hundredths and three-tenths)*

   **Shade the decimals and compare.**

   **Is 0.03 greater than or less than 0.3?** *(less than)*

   **Explain how you know.** *(fewer parts are shaded)*

   **We can see from the shaded amounts that three-hundredths is less than three-tenths. Write the less than symbol.**

   **Read the sentence together. Ready, read: "three hundredths is less than three tenths."**

## Practice                                                    Time: 8 min

Activity 1: Students will compare decimals. Have students turn to *Practice Sheets* on pages 100 and 101. Students will work with a math partner to complete the activity.

**Say:**   **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- How do you say the decimal numbers?

- How do you write the decimal numbers as fractions?

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- Describe the shaded amounts.

- Are the amounts equivalent?

- Which is greater?

- Read the sentence.

Activity 2: The students will compare decimals. In pairs, students will play *Comparing Decimals Tic Tac Toe* game on **Practice Sheet** on pages 102. Use the **Fractions and Decimals Mat** and dry erase marker to solve problems as you play.

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:**     **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 15

# Comparing a Fraction to a Decimal

| Lesson Objectives | • The student will compare a fraction to a decimal number.<br>• The student will read and write fractions and decimals involving tenths and hundredths.<br>• The student will use vocabulary related to fractions and decimals to compare a fraction to a decimal number. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, denominator, equal sign =, equivalent, hundredths, greater than symbol >, less than symbol <, numerator, tenths | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 211 – 226)<br><br>• Fractions and Decimals Mat<br><br>• Dry erase marker | • Student Booklet (pp. 106 – 113)<br><br>• Fractions and Decimals Mat (1 per student)<br><br>• Dry erase marker (1 per student)<br><br>• *Who Has More?* Cards (1 set per student pair) |

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## Preview

**Say:**     **Today we will compare a fraction and a decimal.**

## Engage Prior/Informal Knowledge          Time: 3 min

Have students review comparing two decimal numbers such as 0.2 and 0.28 using >, <, or = symbols. Tell students to write, shade, and compare the decimal numbers using the *Fractions and Decimals Mat* and a dry erase marker.

Ask questions and give directions such as:

- Read the decimals. *(two-tenths and twenty-eight hundredths)*

- How many tenths are shaded? *(two-tenths)* Hundredths? *(twenty-eight hundredths)*

- What is two tenths equivalent to in hundredths? *(20 hundredths)*

- Describe the shaded models. *(0.2 has fewer shaded parts than 0.28)*

- Which model has a greater amount shaded? *(0.28)* Least amount shaded? *(0.2)*

- Write the correct symbol and read the sentence. *(two-tenths is less than twenty-eight hundredths)*

## Modeled Practice          Time: 8 min

1. Students will compare a decimal number to a fraction using >, <, or =.

   Have students turn to *Modeled Practice Sheet #1.* The teacher and students will completed the steps together as the lesson progresses.

**Say:**     **What do both models represent?** *(1 whole)*

   **Both models represent 1 whole.**

   **How is the whole on the left divided?** *(into ten-tenths or by tenths)*

   **It is divided into tenths. How many tenths are in 1 whole?** *(ten-tenths)*

**How is the 1 whole on the right divided?** *(into one hundred hundredths)*

**It is divided into one hundred hundredths.**

**What do you notice about the 2 numbers below the models?** *(one is a decimal and the other is a fraction)*

**We are going to compare a decimal to a fraction.**

**Read the decimal on the left.** *(nine-tenths)*

| Teacher Note |
|---|
| Read the decimal 0.9 as "nine-tenths" rather than "point nine." Read all decimals in the lesson using place value language. |

**The decimal on the left is nine tenths.**

**How many tenths will we shade?** *(9)*

**Shade 0.9.**

**Count the tenths. Ready, count: One tenth, two tenths, … nine tenths.**

**Read the fraction on the right.** *(seventy-six hundredths)*

**The fraction on the right is $\frac{76}{100}$.**

**How many hundredths will we shade?** *(76)*

**A row or column has ten-hundredths. How many hundredths in 1 row or 1 column?** *(ten-hundredths)*

**Shade $\frac{76}{100}$.**

**Let's count the shaded area to check that we have shaded seventy-six hundredths. Ready, count: Ten hundredths, twenty**

**hundredths, … seventy hundredths, seventy-one hundredths, seventy-two hundredths… seventy-six hundredths.**

**Now compare the shaded models. What do you notice?** *(nine-tenths has more shaded parts than seventy-six hundredths)*

**Which model has less shaded: nine-tenths or seventy-six hundredths?** *(seventy-six hundredths)*

**Which model has more shaded?** *(nine-tenths)*

**We can see from the shaded models that the decimal 0.9 is greater than the fraction $\frac{76}{100}$.**

**Write the correct symbol in the circle.**

**Read the sentence. Ready, read: "Nine-tenths is greater than seventy-six hundredths."**

**Go to the next problem on the sheet. Read the fraction on the left.** *(seven-tenths)*

**Read the decimal on the right.** *(eighty-four hundredths)*

**Shade the models to represent the fraction and decimal.**

**Now compare the shaded models. What do you notice?** *(the amount shaded in seven-tenths is less than eighty-four hundredths)*

**Which model has more shaded?** *(the decimal 0.84)*

**Less shaded?** *(the fraction $\frac{7}{10}$)*

**We can see that $\frac{7}{10}$ is less than 0.84.**

**Write the correct symbol in the circle.**

**Read the sentence. Ready, read: "Seven-tenths is less than eighty-four hundredths. "**

2. Students will compare a decimal number to a fraction using >, <, or =.

Have student turn to *Modeled Practice Sheet #2.* Continue to work together as a group.

**Say:**     **Read the decimal on the left.** *(ninety-four hundredths)* **Shade it.**

**Read the fraction on the right.** *(ten tenths)* **Shade it.**

**What do you notice about the model on the right?** *(the whole model is shaded)*

**What whole number is ten tenths equivalent to?** *(1)* **Write it in the box.**

**Now compare the shaded models and write the symbol in the circle.**

**Read the sentence. Ready, read: "Ninety-four hundredths is less than ten-tenths or 1 whole."**

## Practice                                                    **Time: 8 min**

Activity 1: Students will compare a decimal and a fraction. Have students turn to *Practice Sheets* on pages 108 and 109. Students will work with a math partner to complete the activity.

**Say:**     **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- How do you say the decimal?

- Describe the shaded amounts.

- Are the amounts equivalent?

- Which is greater? Less?

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- Read the sentence.

Activity 2: In pairs, students will compare decimals numbers to fractions using the *Who Has More? Cards*. Player 1 will use the stack of decimal numbers, and Player 2 will use the stack of fractions. Students will each draw a card and discuss which number is greater, the decimal or fraction. The player with the greater number keeps the 2 cards from the round. Continue to play until all the cards have been used. The player with the most pairs of cards wins.

## Independent Practice                          Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:     You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

**ESTAR INTERVENTION**

**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 16

# Ordering Decimals from Least to Greatest

| Lesson Objectives | • The student will order decimals from least to greatest.<br>• The student will read and write decimals.<br>• The student will use vocabulary related to decimals to order from least to greatest. |
|---|---|
| **Vocabulary** | **No new words are introduced.** |
| **Reviewed Vocabulary** | decimal, denominator, equivalent, hundredths, numerator, tenths |

| Instructional Materials | **Teacher** | **Student** |
|---|---|---|
| | • Teacher Masters (pp. 227 – 238)<br><br>• Fractions and Decimals Mat<br><br>• Dry erase marker | • Student Booklet (pp. 114 – 119)<br><br>• Fractions and Decimals Mat (1 per student)<br><br>• Dry erase marker (1 per student)<br><br>• *Decimal Ordering* Cards (1 set per student pair) |

## Preview

**Say:** **Today we will order decimals from least to greatest.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students review comparing a decimal to a fraction, such as 0.46 and $\frac{8}{10}$ ,using >, <, or =. Tell students to write, shade, and compare the decimals and fractions using the *Fractions and Decimals Mat* and dry erase marker.

**Say:** **Write the decimal forty-six hundredths under the first model.** *(0.46)* **Shade the model to represent the decimal.**

**Write the fraction eight-tenths below the second model.** $(\frac{8}{10})$ **Shade the model to represent the fraction.**

Ask questions such as:

- How many tenths are shaded? Hundredths?

- Describe the shaded models.

- Which model has a greater amount shaded? Less amount shaded?

- How do you read the comparison sentence?

## Modeled Practice                                   Time: 8 min

1.  Students will order decimals from least to greatest.

    Have student turn to the *Modeled Practice Sheet*. The teacher and students will complete the sheet together as the lesson progresses.

**Say:** **We will order these 3 decimals from least to greatest.**

**Read the first decimal.** *(seventeen-hundredths)*

**Second decimal?** *(seven-hundredths)*

**Third decimal?** *(seven-tenths)*

**Shade each model to represent the decimal above it.**

**Look carefully at the shaded models. Which model has the least shaded amount?** *(seven-hundredths)*

**How do you know 0.07 is less than 0.17?** *(less parts are shaded when compared to 0.17)*

**0.07 has less shaded parts.**

**How do you know 0.07 is less than 0.7?** *(less parts are shaded when compared to 0.7)*

**We can see from the shaded models that 0.07 is less than 0.17 and 0.7.**

**0.07 will be the first decimal in the list of numbers from least to greatest. Write 0.07 on the first line.**

**We have 2 decimals left: 0.17 and 0.7. Between these 2 decimal which is greater?** *(seven-tenths)*

**How do you know 0.7 is greater than 0.17?** *(there is more shaded in 0.7 than 0.17)*

**0.7 is greater. Write it on the last line.**

**Which of the 3 decimals is between 0.07 and 0.7?** *(seventeen-hundredths)*

**Why?** *(the shaded models show 0.17 is greater than 0.07 and less than 0.7)*

**How many hundredths is 0.7 equivalent to?** *(70 hundredths)*

**We can see from the shaded models that 0.17 is greater than 0.07 and less than 0.7.**

**0.17 goes between the 2 decimals in the list. Write it on the middle line.**

**We ordered the decimals in order from least to greatest. Read the list of decimals.** *(seven hundredths, seventeen-hundredths, seven-tenths)*

2. Students will order decimals from least to greatest.

Continue to use the *Modeled Practice Sheet.*

**Say:** **How do we order these decimals?** *(from least to greatest)*

**We will order 1 whole, 0.8, and 0.39 from least to greatest.**

**How will you shade 1 whole?** *(shade the whole model)*

**Shade the whole model to represent 1.0. Now shade the other decimals.**

**Look carefully at the shaded models. Which has the least amount shaded?** *(thirty-nine hundredths)*

**How do you know 0.39 is less than 0.8 or 1.0? Isn't 39 greater than 8 and 1?** *(less is shaded, 39 is greater than 8 but we are comparing decimals, not whole numbers)*

**How many hundredths is 0.8 equivalent to?** *(80)*

**0.8 is equivalent to 0.80. Is 0.39 less than 0.80?** *(yes)*

**Write 0.39 first in the list.**

**2 decimals remain: 1 whole and 0.8. How would you compare 1 whole and 0.8?** *(1 whole is greater than 0.8)*

**1 whole is greater than 0.8.**

**So which number will go next listing the numbers in least to greatest order?** *(0.8)* **Write it.**

**Which decimal is the greatest?** *(1 whole)*

**Why is 1.0 greater than 0.8 and 0.39?** *(eight-tenths and thirty-nine hundredths are only part of a whole but not the whole thing)*

**How many hundredths are in 1 whole?** *(100)*

**We ordered the decimals from least to greatest. Read the list of decimals.** *(thirty-nine hundredths, eight-tenths, one)*

## Practice

**Time: 8 min**

Activity 1: Students will order decimals from least to greatest. Have students turn to the *Practice Sheet* on page 115. Students will work with a math partner to complete the activity.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- How do you say the decimals?

- Explain what ordering from least to greatest means.

- Describe the shaded amounts.

- Which model has the least amount shaded? Greatest amount shaded?

- What decimal is first in the list? Second? Last?

Activity 2: Students will order the decimals from least to greatest in pairs. Use the *Decimal Ordering Cards*. Students will take 3 cards from the deck, order them on the desk from least to greatest, and discuss their work together. They will then take another set of 3 cards and order. Continue to order the decimal cards from least to greatest until there are no cards left.

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:**    **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

**Module: Fraction and Decimal Relationships**
Lesson 17

# Ordering Decimals from Greatest to Least

| Lesson Objectives | • The student will order decimals from greatest to least. <br> • The student will read and write decimals. <br> • The student will use vocabulary related to decimals to order from greatest to least. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, hundredths, tenths | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 239 – 252) <br><br> • 20 dimes and 10 pennies | • Student Booklet (pp. 120 – 126) <br><br> • *Decimal Ordering* Cards (1 set per student pair) |

## Preview

**Say:**    **Today we will order decimals from greatest to least.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students complete the *Engaged Practice Sheet* to review ordering decimals from least to greatest.

**Say:**    **Shade and write the decimals in order from least to greatest value.**

Ask questions such as:

- How do you read the first decimal? *(forty-hundredths)* Second decimal? *(1)* Third decimal? *(four-hundredths)*

- Describe the shaded amounts. *(answers will vary)*

- What does it mean to order from least to greatest? *(you put numbers in order from the smallest amount to greatest amount)*

- Which decimal has the least amount shaded? *(0.04)*

- Which decimals are less than 1? *(0.40 and 0.04)*

- Which decimal has the greatest amount shaded? *(1)*

- Read the list of decimal in order from least to greatest. *(0.04; 0.40; 1)*

## Modeled Practice                    Time: 8 min

1. Students will order decimals from greatest to least.

    Have students turn to the *Modeled Practice Sheet.* The teacher and students will complete the steps together as the lesson progresses.

**Say:**    **How should we order these 3 decimals?** *(from greatest to least)*

    **Explain what ordering from greatest to least means.** *(you put numbers in order from the greatest amount to smallest amount)*

Read the first decimal. *(seventy-three hundredths)*

Second decimal? *(eight-tenths)*

Third decimal? *(seventeen-hundredths)*

Shade each model to represent the decimal above it.

Look carefully at the shaded models.

What decimal has the greatest shaded amount? *(eight-tenths)*

Write 0.8 first on the line in the list.

2 decimals remain: 0.73 and 0.17.

Compare these 2 decimals. Which has the greatest amount shaded? *(seventy-three hundredths)*

0.73 is greater than 0.17.

Write 0.73 second on the line.

Which model has the least amount shaded? *(seventeen hundredths)*

0.17 has the least amount shaded. This decimal will be last in the ordered list. Write it.

We ordered the decimals in order from greatest to least. Read the list of decimals. *(eight-tenths, seventy-three hundredths, seventeen hundredths)*

These decimals can also represent amounts of money.

Place 7 dimes and 3 pennies in 1 stack, 8 dimes in another stack, and 1 dime and 7 pennies in a third stack. Have a student volunteer count the different stacks of money.

Say:     What is the value of 7 dimes and 3 pennies? ($0.73)

What is the value of 8 dimes? ($0.80) How many pennies is 8 dimes equal to? (80)

**What is the value of 1 dime and 7 pennies? ($0.17)**

**Arrange the amounts of money in order from greatest to least.**

Have student volunteers arrange the stacks of money in the correct order.

**Are the amounts of money arranged correctly from greatest to least?** *(yes)*

**How do you know?** *(allow a variety of answers)*

**The amounts of money are in order from greatest to least.**

2. Students will order decimals from greatest to least.

Continue to use the *Modeled Practice Sheet.*

**Say:**   **Read the decimals.** *(nine-hundredths, seven-tenths, and forty-six hundredths)*

**Shade the 3 decimals.**

**Look carefully at the shaded models. Which has the greatest amount shaded?** *(seven-tenths)*

**How do you know?** *(more is shaded than the other two models)*

**0.7 has the greatest amount shaded. This decimal will be first in the list. Write it on the first line.**

**What 2 decimals remain?** *(nine-hundredths and forty-six hundredths)*

**Compare the 2 decimals. Which has the greatest amount shaded?** *(forty-six hundredths)*

**0.46 is greater than 0.09. Write it on the second line.**

**What decimal has the least amount shaded?** *(nine-hundredths)*

**0.09 is the least. Write it on the last line.**

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**We ordered the decimal in order from greatest to least. Read the list of decimals.** *(seven-tenths, forty-six hundredths, nine-hundredths)*

| **Teacher Note** |
|---|
| Use the coins again for students who need additional practice with ordering decimals. |

## Practice                                                    Time: 8 min

Activity 1: Students will order decimals from greatest to least. Have students turn to the *Practice Sheet* on page 122. Students will work with a math partner to complete the activity.

**Say:     Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- How do you read the decimals?

- Explain what ordering from greatest to least means.

- Describe the shaded amounts.

- Which model has the greatest amount shaded? Least amount?

- What decimal number is first in the list? Second? Last?

Activity 2: Students will order the decimals from greatest to least in pairs. Use the *Decimal Ordering Cards* from Lesson 16. Students will take 3 cards from the deck, order them on the desk from greatest to least, and discuss their work together. They will then take another set of 3 cards and order. Continue to order the decimal cards from greatest to least until there are no cards left.

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## Independent Practice                               Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:**   **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2.  For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

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**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

## Module: Fraction and Decimal Relationships
## Lesson 18

# Adding and Subtracting Decimals Involving Tenths with No Regrouping

| Lesson Objectives | • The student will read and write decimals involving tenths. <br> • The student will add and subtract decimals involving tenths. <br> • The student will use vocabulary related to decimals to add and subtract decimals involving tenths. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, difference, sum, tenths | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 253 – 268) | • Student Booklet (pp. 127 – 134) |

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## Preview

**Say:**    **Today we will add and subtract decimals involving tenths.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students complete the *Engaged Practice Sheet* to review adding and subtracting fractions with denominators of 10.

Ask questions such as:

- How many parts in the whole?

- What is the fractional name of each part? *(one-tenth)*

- How many tenths are in 1 whole? *(10)*

- What is the fraction for the shaded model?

- What is the sum/difference? $(\frac{8}{10}, \frac{6}{10})$

## Modeled Practice                    Time: 8 min

1.  Students will add two decimals involving tenths. Use the *Modeled Practice Sheet.*

**Say:**    **We will use models to help us add decimals, just like we previously used models to compare and order decimals.**

**Look at the shaded models to the left of the plus sign.**

**What do you notice about the shaded models?** *(there are two, one is completely shaded and the other is partially shaded)*

**Ten-tenths is completely shaded. It represents 1 whole. What does it represent?** *(1 whole)*

**The other model is partially shaded. Count the shaded tenths. Ready, count: One-tenth, two-tenths.**

**How many shaded tenths?** *(two-tenths)*

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> **Teacher Note**
>
> Read the decimal 1.2 as "one and two-tenths" rather than "one point two." Read all decimals in the lesson using place value language.

**Two-tenths are shaded. Write the decimal 1.2 on the first line in the number sentence.**

Write the decimal "1.2" on the line while students do the same. Check students' work.

**Say:** **Look at the next shaded models to the right of the addition symbol.**

**How many tenths are shaded in the first model?** *(ten-tenths)*

**Ten-tenths is equivalent to what?** *(1 whole)*

**The completely shaded model represents 1 whole.**

**Count the shaded tenths in the next model. Ready, count: One-tenth, two-tenths, three-tenths.**

**How many shaded tenths?** *(three-tenths)*

**Three-tenths are shaded. Write the decimal 1.3 on the second line in the number sentence.**

Write the decimal "1.3" on the line while students do the same. Check students' work.

**Say:** **To add the 2 decimals, we will add the tenths together and add the whole numbers together.**

Point at the shaded tenths in the partially shaded models as you count.

**Say:** **Count the tenths from the partially shaded models. Ready, count: One-tenth, two-tenths … five-tenths.**

**Now add the wholes. 1 whole plus 1 whole equals what?** *(2)*

**2 wholes plus 0.5 equals what?** *(two and five-tenths)*

**The sum is 2.5. Write the sum on the line.**

Write the decimal "2.5" on the line while students do the same. Check students' work.

**Say:** **Read the equation.** *(1.2 + 1.3 = 2.5)*

2. Students will subtract two decimals involving tenths. Continue to use the *Modeled Practice Sheet.*

**Say:** **In this problem, we will subtract decimals. Look at the shaded model. Write the decimal that represents the shaded models on the line.**

Wait 3-5 seconds for students to work. Check students' work.

**Say:** **How many wholes shaded?** *(2)*

**In the partially shaded model, how many tenths?** *(seven-tenths)*

**What is the decimal for the shaded model?** *(two and seven-tenths)*

**Write the decimal 2.7 on the first line in the number sentence.**

Write "2.7" on the line as students do so. Check students' work.

**Say:** **2 is in the ones place and 7 is in the tenths place.**

**What are we subtracting from 2.7?** *(one and four-tenths)*

**We are subtracting 1.4 from 2.7.**

**Now we will take away 1.4 by crossing out 1 whole and 4 of the tenths from the shaded model.**

**We will start with the tenths. How many tenths will we cross out?** *(four-tenths)*

**Cross out four-tenths.**

Cross out four-tenths as students do so. Check students' work.

**Say:**   **How many wholes will we cross out?** *(1)*

**Cross out 1 whole.**

Cross out 1 whole. Check students' work.

**Say:**   **To find the difference, count what is left. Ready, count: 1 whole, one-tenth, two-tenths, three-tenths. What is the difference?** *(one and three-tenths)*

**The difference is 1.3. Write the difference after the equal sign.**

Write "1.3" on the line. Check students' work.

**Say:**   **Read the equation.** *(2.7 – 1.4 = 1.3)*

## Practice                                      Time: 8 min

Activity 1: Students will add and subtract 2 decimals involving tenths. Have students turn to the *Practice Sheet* on page 129. Students will work with a math partner to complete the activity.

**Say:**   **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- What are you solving for in this problem? *(the distance Gilbert drove)*

- Will you add or subtract? Why? *(add to find the total distance Gilbert drove)*

- Explain how you found the total distance Gilbert drove. *(add 1.3 kilometer + 1.5 kilometer)*
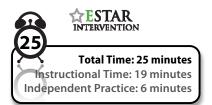
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- What is the total distance? *(2.5 kilometer)*

Activity 2: Have students turn to the *Practice Sheet* on page 130. In pairs, students will read each problem, discuss, and solve the word problems involving decimals.

## Independent Practice                                      Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

   **Say:**   **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

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**Module: Fraction and Decimal Relationships**
Lesson 19

# Adding and Subtracting Decimals Involving Hundredths with No Regrouping

| Lesson Objectives | • The student will read and write decimals involving hundredths.<br>• The student will add and subtract decimals involving hundredths.<br>• The student will use vocabulary related to decimals to add and subtract decimals involving hundredths. |
|---|---|
| **Vocabulary** | **No new words are introduced.** |
| **Reviewed Vocabulary** | decimal number, difference, hundredths, sum, tenths |

| Instructional Materials | **Teacher** | **Student** |
|---|---|---|
| | • Teacher Masters (pp.269 – 282) | • Student Booklet (pp. 135 – 141)<br>• Hundredths Mat<br>• Dry erase marker |

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## Preview

**Say:** **Today we will add and subtract decimals involving hundredths.**

## Engage Prior/Informal Knowledge          Time: 3 min

Have students review modeling, writing, and reading decimals greater than 1. Use the *Hundredths Mat* and dry erase marker. Have students shade decimals such as 1.27, 1.48, and 1.66.

Ask questions and give directions such as:

- How many parts are in the whole? *(one hundred)*

- What is the fractional name of each part? *(one-hundredth)*

- How many hundredths are in 1 whole? *(one hundred-hundredths)*

- Describe the shaded model. How many shaded wholes? How many shaded hundredths?

- Write a decimal for the shaded model.

- Read the decimal.

- Explain how to write the decimal.

## Modeled Practice          Time: 8 min

1. Students will add 2 decimals involving hundredths. Use the *Modeled Practice Sheet.*

**Say:** **We will use models to help us add decimals, just like in the previous lesson.**

**Look at the shaded models to the left of the addition symbol.**

**What do you notice about the shaded models?** *(there are two, one is completely shaded and the other is partially shaded)*

Point to the completely shaded 1 whole.

**Say:** **What does this represent?** *(1 whole)*

**This represents 1 whole. How many hundredths are equivalent to 1 whole?** *(one hundred-hundredths)*

**The other model is partially shaded. Count the shaded hundredths.**

Wait 3-5 seconds for students to work.

**Say:** **How many shaded hundredths?** *(thirteen-hundredths)*

**What is the decimal for the shaded models?** *(one and thirteen-hundredths)*

**Write the 1.13 on the line.**

Write "1.13" on the line as students do so. Wait 3-5 seconds for students to work. Check students' work.

**Say:** **Read the decimal.** *(one and thirteen-hundredths)*

**Now look at the shaded models to the right of the addition symbol.**

**How many shaded wholes?** *(1 whole)*

**How many shaded hundredths?** *(twenty-one hundredths)*

**What is the decimal for the shaded models?** *(one and twenty-one hundredths)*

**Write 1.21 on the line.**

Write "1.21" on the line. Wait 3-5 seconds for students to work. Check students' work.

**Say:** **Read the decimal.** *(one and twenty-one hundredths)*

**To add 2 decimals, add the hundredths together and add the wholes together.**

**Count the hundredths from the partially shaded models.**

Wait 3-5 seconds for students to work.

**Say:**      **How many hundredths in all?** *(thirty-four hundredths)*

        **There are 0.34.**

        **Now we add the shaded wholes. What does 1 whole plus 1 whole equal?** *(2)*

        **1 + 1 = 2.**

        **What does 2 wholes plus 0.34 equal?** *(two and thirty-four hundredths)*

        **2 + 0.34 = 2.34.**

        **Write the sum on the line.**

Write "2.34" on the line. Check students' work.

**Say:**      **These decimals can also be added together like money. Write a dollar sign in front of all 3 decimals.**

        **If we added $1.13 + $1.21, then what is the sum?** *($2.34)*

2. Students will subtract 2 decimals involving hundredths. Continue to use the *Modeled Practice Sheet.*

**Say:**      **In this problem, do we add or subtract?** *(subtract)*

        **Look at the shaded models. Write the decimal that represents the shaded models on the line.**

Wait 3-5 seconds for students to work. Check students' work.

**Say:**      **How many wholes shaded?** *(1)*

        **In the partially shaded model, how many hundredths?** *(seventy-eight hundredths)*

        **What is the decimal for the shaded model?** *(one and seventy-eight hundredths)*

        **Write 1.78 on the first line.**

**What do we subtract from 1.78?** *(0.22)*

**Subtract twenty-two hundredths from the shaded model by crossing it out.**

**We will cross out the hundredths by columns of 10 since we know that 10 hundredths are in each column.**

**Count the hundredths as you cross them out. Ready, count: Ten-hundredths, twenty-hundredths, twenty-one hundredths, twenty-two hundredths.**

Cross out the hundredths. Check students' work. Make sure students are crossing out columns of 10.

**Say:**     **How do we find the difference?** *(count what is left)*

**Count what is left. Ready, count: 1 and ten-hundredths, twenty-hundredths...fifty-hundredths, fifty-one hundredths…fifty-six hundredths.**

**What is the difference?** *(one and fifty-six hundredths)*

**The difference is 1.56. Write it on the last line.**

Write "1.56" on the line.

**Say:**     **Read the equation** *(1.78 - 0.22 = 1.56)*

**This equation could also represent money. I had $1.78 and spent $0.22. How much money do I have left?** *($1.56)*

## Practice                                                    Time: 8 min

Activity 1: Students will add and subtract 2 decimals involving hundredths. Have students turn to the *Practice Sheet* on page 136. Students will work with a math partner to complete the activity.

**Say:**     **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions and give directions such as:

- What are you solving for in this problem? *(the amount of lemonade remaining)*

- Will you add or subtract? Why? *(subtract to find how much lemonade is left)*

- Describe how to shade the decimals.

- Explain how you found the amount of lemonade remaining. *(crossed out 1.3 from 2.58)*

- What is the amount of lemonade left? *(1.28 liters)*

Activity 2: Have students turn to the *Practice Sheet* on pages 137. In pairs, students will read each problem, discuss, and solve the word problems involving decimals.
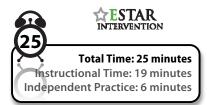
## Independent Practice                                              Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:** **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

**☆ESTAR**
**INTERVENTION**

**25**

**Total Time: 25 minutes**
Instructional Time: 19 minutes
Independent Practice: 6 minutes

## Module: Fraction and Decimal Relationships
### Lesson 20

# Solving Decimal Word Problems

| Lesson Objectives | • The student will solve decimal word problems involving addition and subtraction. <br> • The student will read and write decimals involving tenths and hundredths. <br> • The student will use vocabulary related to decimals to add and subtract decimal numbers involving tenths and hundredths. | |
|---|---|---|
| **Vocabulary** | **No new words are introduced.** | |
| **Reviewed Vocabulary** | decimal, difference, hundredths, sum, tenths | |
| **Instructional Materials** | **Teacher** | **Student** |
| | • Teacher Masters (pp. 283 – 296) <br> • Hundredths Mat <br> • Dry erase marker | • Student Booklet (pp. 142 – 148) <br> • Hundredths Mat <br> • Dry erase marker |

## Preview

**Say:** **Today we will solve word problems involving decimals.**

## Engage Prior/Informal Knowledge                    Time: 3 min

Have students review adding and subtracting decimals such as 0.24 + 0.52 and 0.75 - 0.53. Use the *Hundredths Mat* and dry erase marker.

Ask questions and give directions such as:

- Shade the models. How many shaded tenths? Hundredths?

- Count the sum/difference.

- What is the sum/difference? (0.76/0.22)

- When you subtract, how many tenths/hundredths did you cross out?

- How do you use the models to add/subtract?

## Modeled Practice                    Time: 8 min

1. Students will solve an addition word problem involving decimals. Use *Modeled Practice Sheet #1.*

**Say:** **We will read word problems together and determine whether to add or subtract before using models to help solve.**

**Read the first problem together. Ready, read: The blue rain barrel collected 2.6 liters of water and the red rain barrel collected 3.3 liters of water. How much water was collected in the two rain barrels?**

**What are we solving for in this problem?** *(how much water was collected in the rain barrels)*

**To find the total amount of rain collected, do we add or subtract?** *(add)*

**We add the amounts of water from the blue and red barrels to find the total amount of water collected.**

**What 2 amounts do we add?** *(2.6 liters and 3.3 liters)*

**Write an expression to represent the word problem.**

Complete the steps as students work. Wait 3-5 seconds for students to work. Check students' work.

**Say:** **Read the problem.** *(2.6 + 3.3 = )*

**Now shade the models to help us solve the word problem.**

**For 2.6 liters of water, how many wholes or liters do we shade?** *(2 wholes or 2 liters)* **Shade it.**

**How many tenths of a liter?** *(six-tenths of a liter)* **Shade it.**

**For 3.3 liters, how many wholes or liters do we shade?** *(3 wholes or 3 liters)* **Shade it.**

**How many tenths of a liter?** *(three-tenths of a liter)* **Shade it.**

**To find the total amount of water collected from the rain barrels, first count the tenths. Ready, count: One-tenth, two-tenths … nine-tenths. How many shaded tenths?** *(nine-tenths)*

**Count the shaded wholes. Ready, count. One, two … five. How many shaded wholes?** *(5)*

**What is the total amount of water collected from both rain barrels?** *(5.9 liters)* **How do you write 5.9?** *(write a 5 in the ones place and a 9 in the tenths place to the right of the decimal)* **Write it.**

**How much water was collected in the two rain barrels?** *(5.9 liters of water)*

2. Students will solve a subtraction word problem involving decimals. Use *Modeled Practice Sheet #2.*

**Say:** **Read the next problem. Ready, read: Gabriel has $4.55. He spent $3.50 on his lunch. How much money does Gabriel have after buying his lunch?**

**ESTAR**
**INTERVENTION**

**What are we solving for in this problem?** *(how much money Gabriel has left)*

**The decimals in this problem represent money. The whole numbers represent dollars and the hundredths represent cents.**

**How many cents in 1 dollar?** *(100 cents)*

**There are 100 cents in 1 dollar just like there are one hundred-hundredths in 1 whole.**

**We are solving to find how much money Gabriel has left after buying his lunch.**

**To find how much money he has left, do we add or subtract?** *(subtract)*

**We subtract to find the difference or amount of money left after he buys his lunch.**

**How much money did Gabriel have before buying lunch?** *($4.55)*

**How much was his lunch?** *($3.50)*

**Write an expression to represent the problem.**

Complete the steps as students work. Wait 3-5 seconds for students to work. Check students' work.

**Say:**   **Read the number sentence.** *($4.55 - $3.50 = )*

**When we subtract using models we only shade the greatest decimal and then subtract from it. Shade the model to represent $4.55.**

Wait 30 seconds for students to work. Check their work.

**Say:**   **How many wholes or dollars did you shade?** *(4 wholes or 4 dollars)*

**How many hundredths or cents did you shade?** *(fifty-five hundredths or 55 cents)*

**What do we subtract from the shaded model of $4.55?** *($3.50)*

**We will start subtracting by crossing out the hundredths or cents. How many hundredths or cents will be crossed out?** *(50 hundredths or 50 cents)*

**What is an efficient way to cross out fifty-hundredths?** *(cross out 5 columns of 10)* **Cross out 5 columns.**

**How many hundredths or cents are left?** *(five-hundredths or 5 cents)*

**How many wholes or dollars will we subtract** *(3 dollars)* **Cross it out.**

**How do we find the difference or how much money he has left?** *(count what is left)*

**To find the difference, count what is left. Ready, count: 1 dollar, one cent, two cents … five cents. How much does Gabriel have left after buying his lunch?** *($1.05)*

**Gabriel has $1.05 after buying his lunch. What do we write in the ones place or how many dollars left?** *(1)* **How many cents left?** *(5)* **Do we write 5 in the tenths or hundredths place?** *(hundredths place)* **Why?** *(there are five cents left, not fifty cents)* **What do we write in the tenths place then?** *(0)* **Write how much money Gabriel has after buying his lunch.**

Check students' work.

**Say:** **How do you read $1.05 as a decimal number?** *(one and five-hundredths)*

## Practice

**Time: 8 min**

Activity 1: Students will solve addition and subtraction decimal word problems, write an expression and then solve using the models. Have students turn to the *Practice Sheet* on page 144. Students will work with a math partner to complete the rest of the activity.

**Say:** **Solve the first problem on your own. After we discuss the answer, you will work with your math partner to solve the rest of the problems.**

Monitor students' work and provide corrective feedback when necessary. Allow students to explain how they solved the problem.

Ask questions such as:

- What are you solving for in this problem? *(the total amount of money Rosa earned)*

- Will you add or subtract? Why? *(add because you are finding how much money she earned in all)*

- Describe how to shade the decimal numbers. *(shade 2 wholes and 50 hundredths and then shade 2 wholes and 25 hundredths)*

- Explain how you used the models to solve the problem. *(count the hundredths first and then the wholes)*

- What is the total amount of money Rosa earned? *($4.75)*

Activity 2: Have students turn to the *Practice Sheet* on page 145. Students will read the problem, discuss, and write expressions to solve word problems involving decimals.

## Independent Practice                                    Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and tell students to complete as many items as possible.

**Say:** **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.