



# Working with Fractions and Decimals

## Content Goals

- Students will express a fraction with a denominator of 10 as an equivalent fraction with denominator 100 and add two fractions.
- Students will write decimals for fractions with denominators of 10 and 100.
- Students will use the symbols  $>$ ,  $<$ , or  $=$  to compare decimals to hundredths.

### Manipulatives

- magnetic manipulatives (*teacher only*)
- $\frac{1}{10}$  fraction pieces (*8 per student*)

### Materials

- copies of the *Fraction Grids Activity Board* (page 81)
- copies of the *Blank Grids* sheet (page 82)
- copies of the *Terrific Trees* activity sheet (page 83)
- copies of the *Fractions and Decimals, Naturally* assessment (page 84)



## Let's Talk!

**Step 1:** Get students talking about nature. Ask them to talk about their favorite things in nature. Take students outside the classroom or on the playground. Have students sit quietly for a few minutes to listen and observe nature. Return to the classroom and ask students to share what they saw and heard.

**Step 2:** Ask students, "What plants do you see in nature? What are some of your favorite plants?" Allow time for students to share their ideas.

**Step 3:** Remind students that plants need sunlight, air, soil, and water to grow. Ask students, "How much do you think plants grow in a year?" Have them share their ideas. Then say, "Tree A grows  $\frac{4}{10}$  of a foot in a year. Tree B grows  $\frac{50}{100}$  of a foot in a year. How much do the trees grow in all?"

**Step 4:** Ask students the essential questions. Write them on the board. Tell the class they are going to use their tools to find equivalent fractions for fractions with denominators of 10 and 100. Tell students they will also write fractions as decimals and compare two decimals.

## Essential Questions

How can we add fractions with different denominators? How can we write fractions as decimals?

## Rules Reminder

Remind students that they must follow the rules when working with manipulatives. Read the rules aloud before distributing the manipulatives.



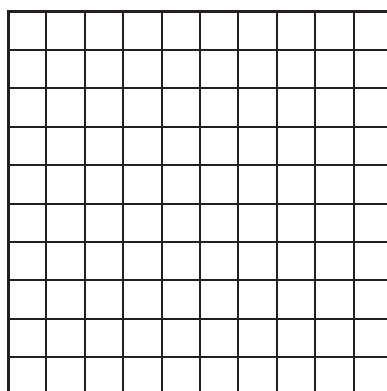
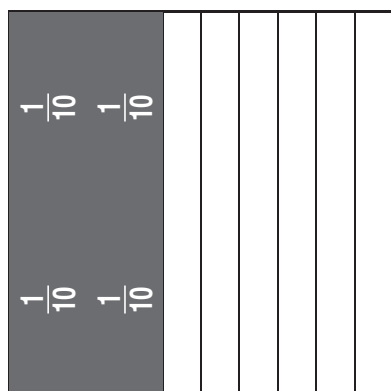


# All Together Now!

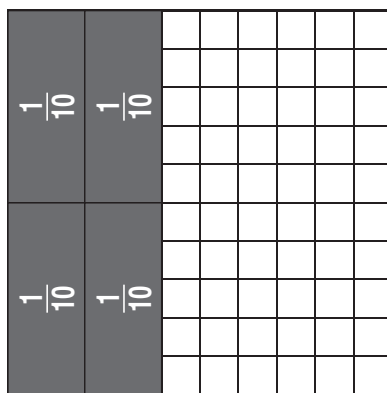
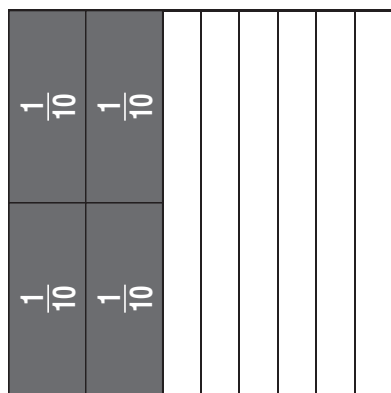
**Step 1:** Distribute copies of the *Fraction Grids Activity Board* (page 81) to students. Give each student the fraction pieces. Have students place their tools above their activity boards. Tell students not to touch them again until you say that they can.

**Step 2:** Recreate the activity board on the classroom board. Point out that the first grid represents tenths and the second grid represents hundredths. Say, "Let's revisit the problem from earlier." Write the following problem on the board: *Tree A grows  $\frac{4}{10}$  of a foot in a year. Tree B grows  $\frac{50}{100}$  of a foot in a year. How much do the trees grow in all?*

**Step 3:** Say to students, "One fraction uses tenths and the other fraction uses hundredths. In order to add these fractions, we need to find an equivalent fraction for  $\frac{4}{10}$  using hundredths. First, I will represent  $\frac{4}{10}$  on the tenths grid." Using the magnetic manipulatives, place  $\frac{4}{10}$  on the tenths grid. Have students do the same thing with their tools.



**Step 4:** Say, "Notice that  $\frac{4}{10}$  covers four parts out of ten parts on the grid. Now we need to decide how many hundredths are equivalent to  $\frac{4}{10}$ . We do not have fraction pieces to represent hundredths, but we can use the tenths fraction pieces to cover the same amount of space on the hundredths grid." Use the magnetic manipulatives to place four  $\frac{1}{10}$  pieces on the hundredths grid. Have students do the same thing with their tools.





# All Together Now! (cont.)

**Step 5:** Say to students, "Remember that equivalent fractions take up the same part of the whole. The same amount of area is covered on both grids. On the tenths grid, four columns represent the fraction  $\frac{4}{10}$ . On the hundredths grid, four columns are also covered. However, each column is broken into ten squares. So, there are actually 40 squares covered. This means that  $\frac{40}{100}$  is equivalent to  $\frac{4}{10}$ ."

**Step 6:** Revisit the problem written on the board. "Now that we have an equivalent fraction for  $\frac{4}{10}$ , we can find the total amount that Trees A and B grew in a year. Tree A grows  $\frac{40}{100}$  of a foot. Tree B grows  $\frac{50}{100}$  of a foot. How much do they grow in all?" ( $\frac{90}{100}$  of a foot) "How do you know?" ( $\frac{40}{100} + \frac{50}{100} = \frac{90}{100}$ )

$$\frac{40}{100} + \frac{50}{100} = \frac{90}{100}$$

**Step 7:** Say, "We can also write these fractions as decimals." On the board, recreate the following place value chart.

Hundreds	Tens	Ones		Tenths	Hundredths
			.		

**Step 8:** Point out the decimal point on the chart. Say, "The places to the right of the decimal point represent less than one whole. These are fractions of a whole. The numbers to the left of the decimal point are whole numbers." Under the equation on the board, write the decimal representation for each fraction. Say, "These are two ways to write the same thing. One is written as a fraction, and one is written as a decimal. Both represent the same exact amount that the trees grow in all."

$$\frac{40}{100} + \frac{50}{100} = \frac{90}{100} \text{ of a foot}$$

$$0.40 + 0.50 = 0.90 \text{ of a foot}$$

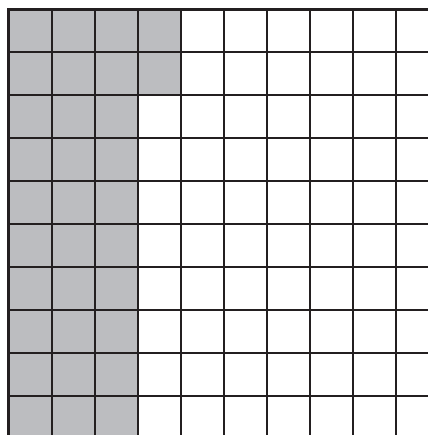
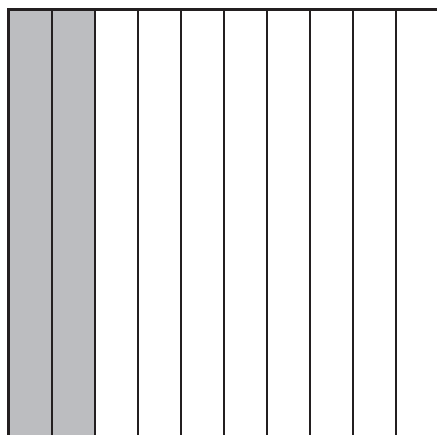
**Step 9:** Distribute copies of the *Blank Grids* sheet (page 82) to students. Say, "We can use these blank grids to find equivalent fractions between tenths and hundredths. Instead of using fraction pieces, we can simply shade in the fractions. We can also use two hundredths grids to compare two decimals to hundredths."





# All Together Now! *(cont.)*

**Step 10:** Say to students, "Let's compare 0.2 and 0.32." Write  $0.2 \bigcirc 0.32$  on the board. Say, "We will use the first row of blank grids to shade the tenths grid to show 0.2, which is the same as the fraction for  $\frac{2}{10}$ ." Shade in  $\frac{2}{10}$  on the tenths grid. "The next decimal is 0.32." Then, shade in 0.32, or  $\frac{32}{100}$  on the  $10 \times 10$  grid. Have students do the same thing on their sheets.



**Step 11:** Ask students, "Which decimal is larger?" (0.32) "How do you know?" ( $\frac{2}{10}$  takes up less area than  $\frac{32}{100}$ ) "So, we know that 0.2 is less than 0.32."

$$0.2 < 0.32$$

**Step 12:** Repeat steps 10 and 11 with additional decimals.





# Teamwork Time!

**Step 1:** Review the *Working as a Team* (page 154) rules sheet with students. Place students in small groups. Have students place their tools above their activity boards.

**Step 2:** On the board, write  $\frac{3}{10} + \frac{40}{100} = \underline{\hspace{2cm}}$ . Say, "Work with your groups to add these fractions. Remember to find an equivalent fraction for  $\frac{3}{10}$  using hundredths before you can add. Use your grid and tools to help you." Allow groups time to find the answer. ( $\frac{70}{100}$ ) Ask one group to come to the board and use the magnetic manipulatives to show and explain how they found an equivalent fraction for  $\frac{3}{10}$ . Then have a group add the fractions.

**Step 3:** On the board write  $0.45 \bigcirc 0.39$ . Allow groups time to find the answer. Ask one group to come to the board and use grids to show and explain how they found the answer. Write the answer on the board. (>)



## You Can Do It!

**Step 1:** Distribute copies of the *Terrific Trees* activity sheet (page 83) to students. Tell students they can use their grids to help them if they need them. Have students complete the activity sheet independently.

**Step 2:** When students have finished, go over the answers as a class. Ask students if they were able to find the answers without using manipulatives. If so, how did they do it? Discuss as a class how visualization and drawings can help students if they do not have manipulatives to use.



## Show What You Know!

Distribute copies of the *Fractions and Decimals, Naturally* assessment (page 84) to students. Tell students they can visualize or draw on scratch paper if necessary.

### Put It in Words!

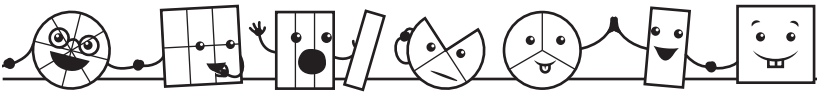
Write the prompt on the board.

*A blue bird flies 0.62 miles to find food. A red bird flies  $\frac{3}{10}$  miles to find food. Which bird flew more? How do you know?*

Have a class discussion about how to write the fraction as a decimal and then compare decimals. Have students find the answer. Then have students explain in their journals how fractions and decimals are related.

Answer to prompt: The blue bird flew more;  $0.62 > 0.30$



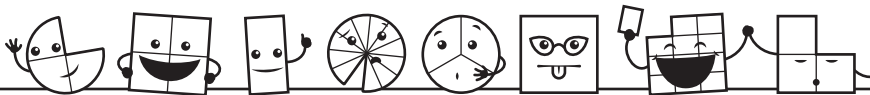


Name: \_\_\_\_\_

# Fraction Grids Activity Board

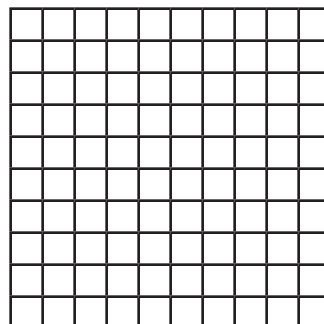
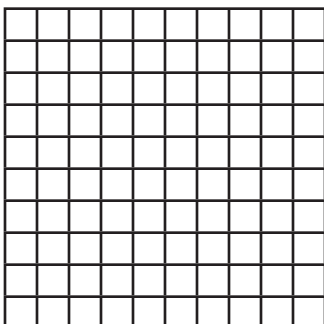
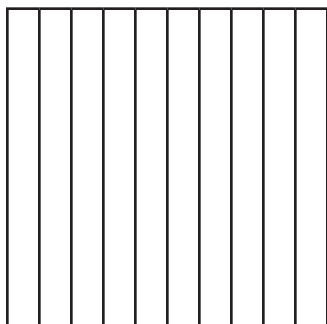
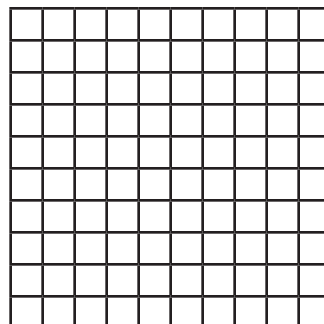
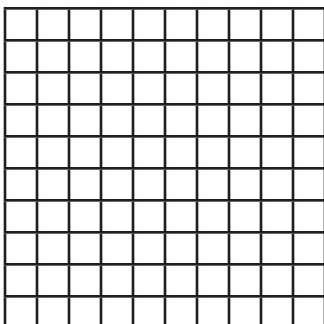
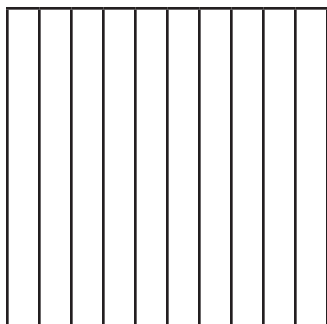
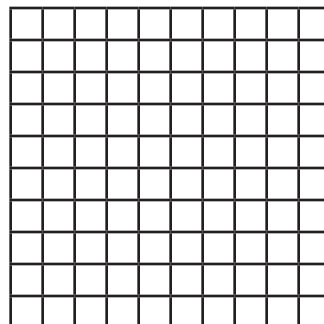
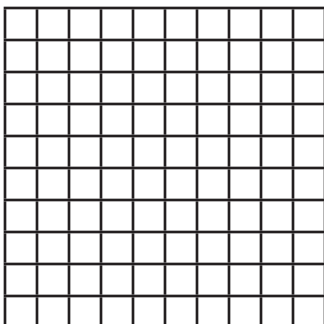
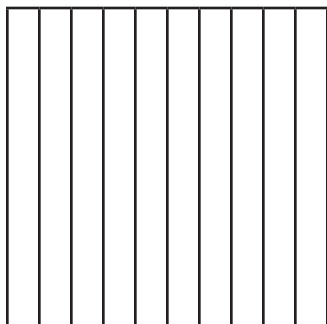
**Hundredths**


**Tenths**

Name: \_\_\_\_\_

## Blank Grids





Name: \_\_\_\_\_

# Terrific Trees

**Directions:** Circle the tree with the correct answer.

**1**  $\frac{3}{10} + \frac{65}{100}$



**2**  $\frac{15}{100} + \frac{2}{10}$



**3**  $\frac{7}{10} + \frac{10}{100}$



.....

**Directions:** Write each fraction as a decimal.

**4**  $\frac{6}{10}$  \_\_\_\_\_

**5**  $\frac{47}{100}$  \_\_\_\_\_

**6**  $\frac{81}{100}$  \_\_\_\_\_

**7**  $\frac{1}{10}$  \_\_\_\_\_

.....

**Directions:** Write >, <, or = to compare the decimals.

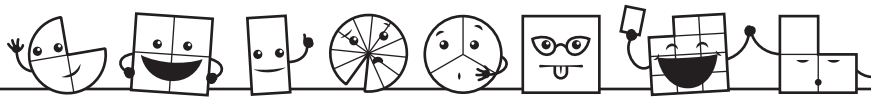
**8** 0.07  0.70

**9** 0.15  0.51

**10** 0.45  0.25

**11** 0.09  0.9



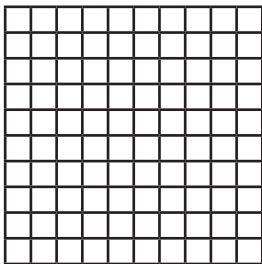
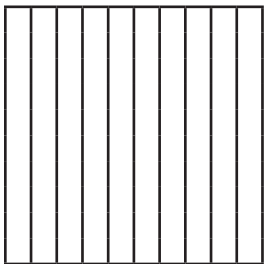


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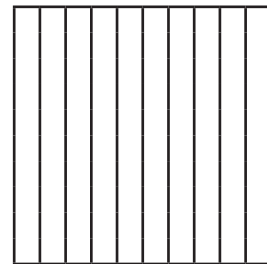
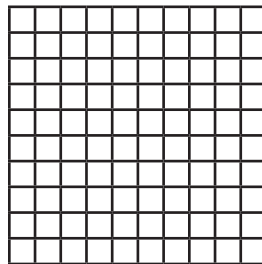
# Fractions and Decimals, Naturally

**Directions:** Add the fractions.

**1**  $\frac{5}{10} + \frac{32}{100} =$  \_\_\_\_\_



**2**  $\frac{75}{100} + \frac{2}{10} =$  \_\_\_\_\_



**Directions:** Write each fraction as a decimal.

**3**  $\frac{45}{100}$  \_\_\_\_\_

**4**  $\frac{25}{100}$  \_\_\_\_\_

**5**  $\frac{5}{10}$  \_\_\_\_\_

**6**  $\frac{7}{10}$  \_\_\_\_\_

**Directions:** Write >, <, or = to compare the decimals.

**7**  $0.45 \bigcirc 0.75$

**8**  $0.20 \bigcirc 0.15$

**9**  $0.4 \bigcirc 0.04$

**10**  $0.28 \bigcirc 0.88$

