LESSON 4

Number and Operations in Base Ten

Add and Subtract Decimals I

Objective

Add and subtract decimals.

Common Core State Standards

- **5.NBT.7** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Students should be introduced to a variety of strategies for solving decimal problems, including models, pictures, estimation, and paper-and-pencil computing. The focus of adding and subtracting decimals should be on students' understanding of number sense and operations, rather than a specific computational process. Students use their knowledge of the base ten number system to regroup decimals into whole numbers when adding.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- Explain that the first place to the right of the decimal is "tenths." Write *1.2* on the board. **Ask:** *How do we read this number? How much is the* 2 *worth? How much is the* 1 *worth?*
- **Ask:** *In what situations would it be important to understand decimals? When might you need to add or subtract decimals?*
- **Ask:** *How are adding and subtracting decimals similar to adding and subtracting whole numbers? How are they different?*

Solve It

With students, reread the problem. Have students draw models of Makayla's two pieces of yarn and mark off each tenth. Then have students write a sentence to explain how they added the numbers together to get the total.

More Ideas

For other ways to teach about adding and subtracting decimals—

- Have students practice adding tenths using Two-Color Counters. Direct students to model two addends with the counters yellow-side up. As students count the tenths, they should flip the counters over to the red side and set them aside as a group every time they reach 10.
- Have students use a Place-Value Chart (BLM 10) and Centimeter Cubes to add decimals. Relabel the charts to show ones, tenths, and hundredths. Provide story problem scenarios, and have students model each addend on the chart. Tell students to model the sum in the bottom row of the chart, reminding them to regroup the tenths into whole ones, if necessary.

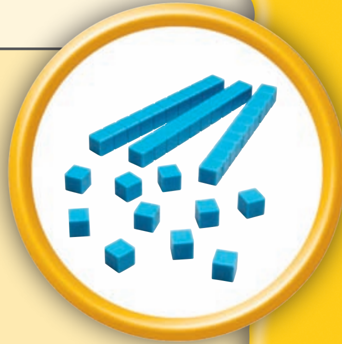
Formative Assessment

Have students try the following problem.

Riana and Jake take turns feeding the class hamster. One week Jake gives the pet 0.7 cups of food, and the next week Riana gives him 0.8 cups of food. How much food in total did the hamster get during the two weeks?

A. 1.3 cups **B.** 1.5 cups **C.** 1.7 cups **D.** 1.9 cups

Try It! 25 minutes | Pairs



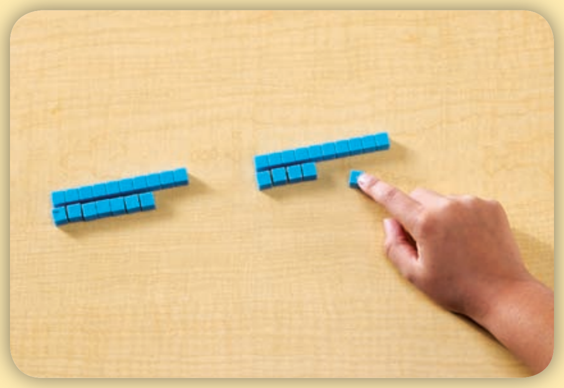
Here is a problem about adding and subtracting decimals.

The art teacher, Mr. Davis, asked students to cut two different lengths of yarn to use in an art project. Makayla cut one piece of yarn that was 0.7 meters long and another that was 0.5 meters long. How much yarn did Makayla cut altogether?

Introduce the problem. Then have students do the activity to solve the problem. Distribute Base Ten Blocks to students.

Materials

- Base Ten Blocks (3 rods and 15 units per pair)



1. Say: *We want to add 0.7 and 0.5. Let's say that for this activity, a rod equals 1 and a unit equals 0.1.* Have students model 0.7 and 0.5 with the blocks.

2. Have students count the units. Then have students regroup the blocks to end up with 1 rod and 2 units. **Ask:** *What number do the blocks add up to?*

3. Ask: *What if we wanted to find the difference between 0.7 and 0.5?* Guide students to model 0.7 – 0.5 with the units. Remind them that they are using 1 rod to represent 1 whole.

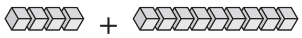
Look Out!

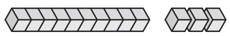
Watch out for students who express a sum greater than 1 in tenths or hundredths. Use Fraction Tower® Equivalency Cubes to reinforce the idea that a sum with 10 or more tenths must be regrouped into a whole number. For example, 0.5 + 0.9 = 1.4, not 0.14.

Answer Key

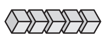
Use Base Ten Blocks to model each decimal. Let a rod equal 1 and a unit block equal 0.1. Fill in the blanks with decimals. Find the sum or difference.

(Check students' work.)

1.  0.4 + 0.9 = 13 unit block

 1.3

2.  0.9 – 0.4 = 5 unit block

 0.5

Using Base Ten Blocks, model each pair of decimals using a rod to equal 1. Then sketch the models. Find the sum or difference.

(Check students' models.)

3. 0.3 + 1.2

1.5

4. 1.3 – 0.6

0.7

Find each sum or difference.

5. 0.8 + 0.3

1.1

6. 0.8 – 0.4

0.4

7. 1.7 – 0.2

1.5

8. 0.3 + 0.8 + 0.5

1.6

9. 0.8 – 0.7

0.1

10. 1.6 – 0.9

0.7

Answer Key

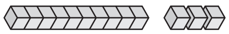
Challenge! Show a different model for Problem 5 that uses the same numbers and has the same sum. What property does your model demonstrate? Can you apply this property to Problem 10? Explain your answer.

Challenge: (Sample) 0.3 + 0.8 = 1.1; Commutative Property of Addition; No; There is no Commutative Property of Subtraction because subtraction is not commutative.

Name ________________________________

Use Base Ten Blocks to model each decimal. Let a rod equal 1 and a unit block equal 0.1. Fill in the blanks with decimals. Find the sum or difference.

1.  +  __________ + ____________ = _______ unit block

 ____________

2.  –  _________ – ____________ = _______ unit block

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Using Base Ten Blocks, model each pair of decimals using a rod to equal 1. Then sketch the models. Find the sum or difference.

3. 0.3 + 1.2

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4. 1.3 – 0.6

____

Find each sum or difference.

5. 0.8 + 0.3

____

6. 0.8 – 0.4

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7. 1.7 – 0.2

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8. 0.3 + 0.8 + 0.5

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9. 0.8 – 0.7

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10. 1.6 – 0.9

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Name ______________________________

Challenge! Show a different model for Problem 5 that uses the same numbers and has the same sum. What property does your model demonstrate? Can you apply this property to Problem 10? Explain your answer.