



## **CONSTRUCTING TASK: It All Adds Up**

*Adapted from: Good Questions for Math Teaching*

### **STANDARDS FOR MATHEMATICAL CONTENT**

**MCC5.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.**

### **STANDARDS FOR MATHEMATICAL PRACTICE**

- 1. Make sense of problems and persevere in solving them.**
- 2. Reason abstractly and quantitatively.**
- 3. Construct viable arguments and critique the reasoning of others.**
- 4. Model with mathematics.**
- 5. Use appropriate tools strategically.**
- 6. Attend to precision.**
- 7. Look for and make use of structure.**
- 8. Look for and express regularity in repeated reasoning.**

### **BACKGROUND KNOWLEDGE**

Students should have had prior experiences identifying and representing decimal numbers. Students should be able to read decimal numbers and understand the value of the whole number compared to tenths and hundredths.

Students should have some concept of divisibility and know that even numbers can be divided by two.

Also, students should have an understanding of how to represent addition with decimal numbers.

#### **Common Misconceptions**

Students might compute the sum of decimals by lining up the right-hand digits as they would whole number. For example, in computing the sum of  $15.34 + 12.9$ , students will write the problem in this manner:

$$\begin{array}{r} 15.34 \\ +12.9 \\ \hline 16.63 \end{array}$$

To help students add decimals correctly, have them first estimate the sum. Providing students with a decimal-place value chart will enable them to place the digits in the proper place.

### **ESSENTIAL QUESTIONS**

- How do we determine which decimal number to add?

- How can I test my pattern to see if it works?
- Could there be more than one correct answer? Why?

### **MATERIALS**

- “It All Adds Up” recording sheet
- pencil
- base ten models, number line

### **GROUPING**

Individual/Partner Task

### **TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION**

Students complete a task that requires them to think about patterns of numbers in addition of decimals. There is more than one correct answer which may lead them to the realization of multiple combinations of numbers can result in the same sum. The focus of this activity is addition of decimals and incorporating the Standards for Mathematical Practice throughout the task.

#### **Comments**

To introduce this task, read the scenario on the recording sheet and clarify vocabulary. Don't spend too much time in introducing the task, but allow students to struggle and seek their own strategies for accomplishing the task. They may work with a partner and look for strategies together. Ask questions that will prompt deeper thinking and move them in the right direction.

As students finish, have them present their findings to the class. As they notice that they may have different answers which are all correct, ask them these questions?

- How can all of these answers be correct?
- Can you find any more correct answers?
- Do you notice a pattern?

#### **Materials:**

- “It All Adds Up” task sheet
- Pencil
- Base Ten models
- Number Line

#### **Task Directions:**

Students will read the directions for the activity and decide on the best way to figure out the answer.

It All Adds Up: See if you can solve the mathematician's problem. Use pictures, words, and numbers to represent your thinking.

A mathematician wrote down a sequence of numbers, adding the same number to each to get the next number. The first number was 2.57 and the last number was 3.61. What could the numbers in between be? *NOTE FOR TEACHERS: Correct answers may be found by adding 0.52, 0.26, 0.13, 0.02, 0.04, or 0.08 to the number each time.*

### **FORMATIVE ASSESSMENT QUESTIONS**

Possible questions include:

- What is the difference between the two numbers?
- What do you know about divisibility?
- What do you notice about the difference?

As students finish, have them present their findings to the class. As they notice that they may have different answers which are all correct, ask them these questions?

- How can all of these answers be correct?
- Can you find any more correct answers?
- Do you notice a pattern?

### **DIFFERENTIATION**

#### **Extension**

Ask students to write another problem using different starting and ending numbers. Ask them what they need to do to be sure they can find multiple correct answers?

#### **Intervention**

- Students may work with partners.
- Students may use calculators.

## It All Adds Up



**Directions:** See if you can solve the mathematician's problem. Use pictures, words, and numbers to represent your thinking.

A mathematician wrote down a sequence of numbers, adding the same number to each to get the next number. The first number was 2.57 and the last number was 3.61. What could the numbers in between be? Explain how you got your answers.