

## Improving Teacher Quality Program

*Mathematics Within: Algebraic Processes and Its Connections to Geometry*

Dennis Whalton

### Context of the lesson:

- 1. To help me understand the context of the lesson, please explain where this lesson occurs within a unit or series of lessons. Describe what led up to this lesson and what will follow.**

The students have experienced place value using ones, tens and hundreds. Now we are exploring decimal place to represent  $1/10$  and  $1/100$  of the whole. Following this lesson will be the addition and subtraction of decimal numbers.

- 2. What is the purpose of this lesson?**

To have students understand parts of a whole (tenths, hundredths) in terms of decimal places.

- 3. What do you anticipate talking place?**

To have students discover the relationship of one, tens and hundreds, and the corresponding relationship of tenths, hundredths.

- 4. What strategies or techniques will you use to monitor learning?**

Students will work with an area model of a whole divided into tenths, then hundredths. Students will see the relationship of silver dollar, ten dimes and 100 pennies.

- 5. How will you know if students have achieved the objective?**

Students will demonstrate the relationship between hundreds, tens, ones, tenths and hundredths as a multiple of 10 of the place to the right or  $1/10$  of the place to the left.

Students will be able to represent decimal values in pennies, a combination of dimes and pennies and a combination of dollars, dimes and pennies.

Students will be able to show equivalent decimal values.

Students will be able to order decimal values.

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**Broad Topic:** Place Value

**Subtopic:** Tenths, Hundredths

**Grade Level:** 5

**Time Frame:** 30 minutes

**Aim:** Understanding fractions in terms of decimal places

### Specific Objectives:

- Students will be able to explain why we do not have a zeroes place.
- Students will be able to explain why we do not have a oneths place.
- Students will be able to show with an area model a value in tenths and its equivalent in hundredths.
- Students will be able to show decimal place value using a silver dollar, ten dimes and one hundred pennies.
- Students will understand that the definition of the whole unit (ones unit) is crucial to accurate representation of decimal values.

### Materials/Supplies:

- Large square for each group.
- Bag for each team containing one cup with a silver dollar, one cup with ten dimes and one cup with one hundred pennies.

**Special Vocabulary:** decimal, decimal point, whole unit, part of a whole unit, equivalent value, tenths, hundredths

**References:** Scott Foresman - Addison Wesley

### Introduction

- Ask about the point of origin of a number line and xy axis. Does that mean we have zero as the point of origin in the place value system? Why or why not?
- Since we have a ones place, surely we have a corresponding oneths place. No? Why not?

### Body

- Using the area model, how would you show 0.1?
- Using the area model, how would you show 0.1 in hundredths?

- We are now going to explore place value using coins. If the silver dollar is the ones unit, what is the tenth unit? The hundredth unit?
- On the area model, tenths was the largest fractional unit, and hundredths  $1/10$  the size of tenths. What do you observe about the physical size of the coins? If not the physical size, what property of the coins are we using to show ones, tenths and hundredths?
- What if the silver dollar is a large old style rather than a small new style?
- What happens if I exchange a paper dollar for a silver dollar? What effect does that have on my tenths (dimes) and hundredths (pennies)?
- Now I would like you to show me, using the coins, a representation of 0.37. How did you arrange your coins? Most had 3 dimes and 7 pennies or 37 pennies. Could you also have had 2 dimes and 17 pennies? Why or why not?

### **Close**

- As we move to the right of the decimal point, what happens to the value of the place value unit?
- What have you discovered about the relationship of hundreds, tens, ones, tenths and hundredths?
- Why is it important to define the value of our whole, or ones, unit?

### **Enrichment**

- Tell students that instead of a base 10 monetary system, we are converting to base 5. The quarter is our ones unit. What will our first place to the right of the decimal point be called? How about two places to the right of the decimal point?
- What coin will represent our fifth place? What coin will represent our twenty-fifth place?
- What symbols used in Base 10 cannot be used in Base 5?
- Using the coins we established for Base 5, show how you would represent 2.34.

### **Assessment**

- 4) Students will demonstrate understanding of the relationship of hundreds, tens, ones, tenths and hundredths.

Students will be able to show decimal values in pennies, a combination of dimes and pennies, and a combination of dollars, dimes and pennies.

Students will be able to find equivalent decimal values.

Students will be able to order a series of decimal values.

- 3) Students will demonstrate understanding of the relationship of hundreds, tens, ones, tenths and hundredths.

Students will be able to show decimal values in pennies, a combination of dimes and pennies, and a combination of dollars, dimes and pennies.

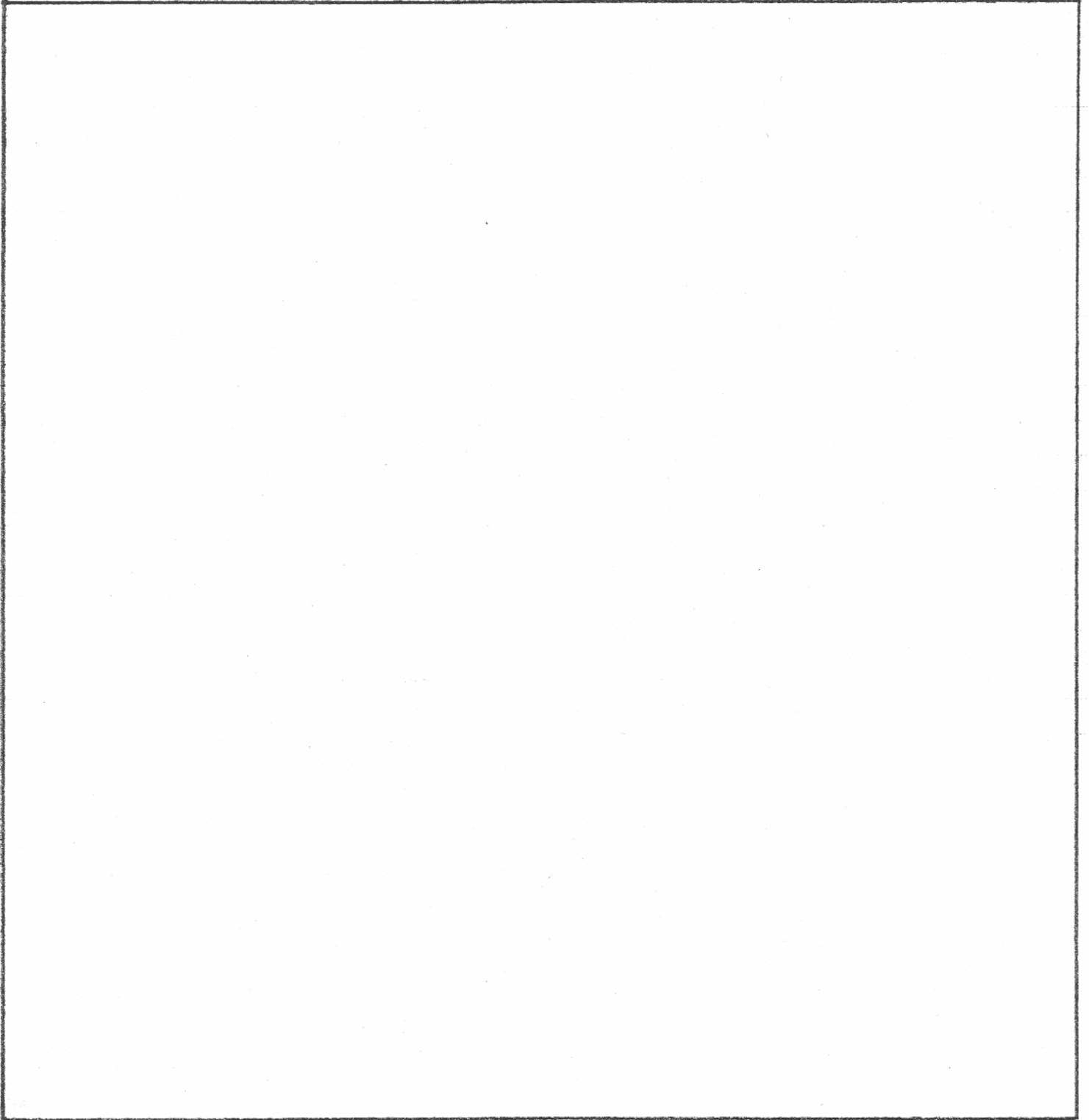
Students will be able to find equivalent decimal values.

- 2) Students will demonstrate understanding of the relationship of hundreds, tens, ones, tenths and hundredths.

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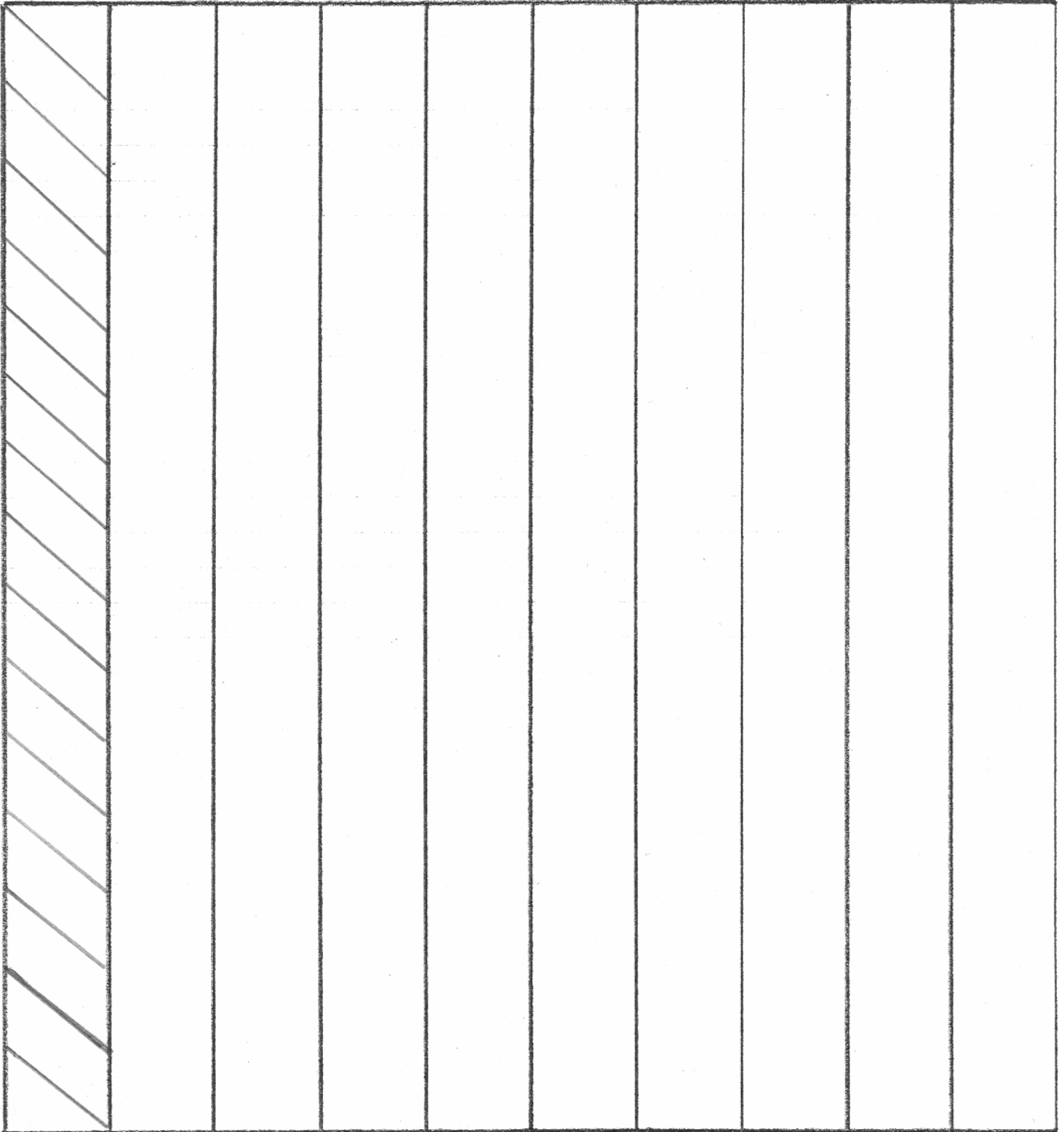
- 1) Students will demonstrate understanding of the relationship of hundreds, tens, ones, tenths and hundredths.

# Whole Unit



# Whole Unit Divided into Tenths

$\frac{1}{10}$  or 0.1



# Whole Unit Divided into Hundredths

$10/100$  or  $0.10$

