



Cumberland County Schools

Objective 1.01b – Place Value of Decimals

Lesson Title: Place Value of Decimals
Curriculum Area: Mathematics
Grade: Fourth
Time: 60 minutes

I. PLAN

A. NCSCS Goal 1:

The learner will read, write, model, and compute with non-negative rational numbers.

B. NCSCS Objective 1.01b:

Build understanding of place value (hundredths through ten thousands).

C. CCS Task Analysis 1.01b:

Build understanding of place value (hundredths through ten thousands).

TLW: Use manipulatives to model hundredths through ten thousands.

TLW: Identify the tenths and hundredths place on a place value chart.

TLW: Read decimals correctly using “and” to denote the decimal point and tenths or hundredths to identify the last place in the number.

TLW: Relate decimal numbers with dollars and cents.

D. CCS Pacing Guide:

Quarter: First

Week(s): 1-4

E. Lesson Background:

Strand: Number and Operations

Marzano Level: Applying

F. Materials:

- Attachment A – two \$1 bills (divided into 10ths)
- Attachment A – one copy per student
- Scissors – one per student
- Attachment B – place value model (to use as transparency)
- Attachment C – place value cards (one set per student pair)
- Base Ten Flat – one hundred (one per student)
- Attachment D – An overhead of several Base Ten flats
- Attachment D – one copy per pair of students
- A set of number cubes for Proficient Learners during Independent practice

G. Prerequisite Skills:

- Understanding of whole number place value – ones, tens, hundreds, thousands, and ten thousands
- Understanding of money value and its equivalence (i.e., 10 dimes = 1 dollar and 100 pennies = 1 dollar)

H. Essential Question(s):

- How can the ability to model decimals (tenths and hundredths) as well as identify decimals on a place value chart help a student read decimals correctly?
- How can relating dollars and cents to decimals help students understand the place value of a decimal?

II. IMPLEMENT

A. Anticipatory Set:

The teacher will begin by telling students that today's math lesson will focus on decimals. "You have been using decimals for a long time and probably haven't even realized it. You have been using decimals ever since you discovered money." The teacher will show the students a one-dollar bill (Attachment A), which has been divided into 10ths. Explain to the students that the dollar bill is a whole. "If I were to divide or cut this dollar bill into parts, I would have less than a whole. If I have less than a whole, I may be using a decimal."

B. Teacher Input:

The teacher defines the terms *decimal* and *decimal point* on the overhead/board by writing the definitions as the students also write the definitions in their journals/notebooks.

- decimal – a number that uses place value and a decimal point to show tenths and hundredths (for emphasis – write the **th** in tenths and hundredths in a different color)
- decimal point – a period separating the ones place and the tenths place in a decimal

"Let's look at what we already know about numbers. We have studied the place value of whole numbers." Show the following diagram on the overhead or board (Attachment B – to use as a transparency). "The numbers to the left of the decimal point are whole numbers. The numbers to the right of the decimal point are numbers that are not a complete whole. We call any number to the right of the decimal point a decimal. A decimal is a number that is less than a whole."

ten thousands	thousands	hundreds	tens	ones	decimal point	tenths	hundredths
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Rehearsal: RallyCoach (Attachment C)

Student Pairs work together to put a set of place value cards (Attachment C) in order.

Students are paired and labeled A or B.

Student A pulls the first place value card from the pile and places it down.

Student B pulls the second card and places it in order according to the first card.

Student A coaches Student B if incorrect and then celebrates.

The process continues until all of the place value cards are in order.

Teacher Input:

"Now let's see how decimals relate to the dollar I showed you earlier." The teacher will hold up the dollar for the students to see while explaining that the dollar represents one whole. "You will notice that the dollar I am holding up has lines through it." The teacher will count to show that the lines create ten sections. "If I have a dollar cut into 10 pieces, I could trade the dollar for 10 dimes. A dime is worth 10 cents. Just as 10 dimes is the same as one dollar and a dollar is the same as 100 cents, ten tenths is the same as 100." Then tell the students that each section represents one tenth. Point to each section and name (i.e., one tenth, two tenths, three tenths, four tenths, five tenths, six tenths, seven tenths, eight tenths, nine tenths, and ten tenths, which is the same as one whole). On the overhead draw a rectangle and divide into ten parts.

one tenth .1	two tenths .2	three tenths .3	four tenths .4	five tenths .5	six tenths .6	seven tenths .7	eight tenths .8	nine tenths .9	ten tenths 1.0
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Label each of the sections on the overhead for the students to see. As the teacher labels each section, he/she will model the correct reading of a decimal (placing emphasis on the **th** sound).

Rehearsal: RallyCoach (Attachment A)

Give each student pair a dollar (Attachment A) and have the students cut the dollar into 10 equal pieces. The students will then take turns labeling the 10 pieces just like the sections previously labeled by the teacher.

Student A labels the first piece and says aloud to his/her partner, "This is one tenth." If Student A is correct, Student B celebrates; if not, Student B coaches and then celebrates. Student B labels the second piece and says aloud to his/her partner, "This is two tenths." If Student B is correct, Student A celebrates; if not, Student A coaches and then celebrates. Continue the process until all pieces are labeled.

Teacher Input:

"We have seen how a dollar can be cut into ten equal pieces to represent a tenth. Let's see how we can use a Base Ten flat to also model tenths." Show the students a Base Ten flat and explain that there are 10 sets of 10 that make up the whole 100. Count by tens to show the students that the total set is 100. "Each 10 that I just counted is the same as a one tenth." The teacher will then count the set of 100 again using decimal form – one tenth, two tenths, etc. On the overhead (Attachment D), show a Base Ten flat and color in two tens to represent two tenths. "I have shaded in two tenths of this Base Ten flat. When I write two tenths, it looks like this--0.2. I have the decimal point. Behind the decimal point is the 0.2, which stands for two tenths."

Rehearsal: RallyCoach (Attachment D)

A pair of students will be given a copy of Attachment D and a red and blue crayon. The teacher will call out a decimal (i.e., 0.3 and 0.8). Student A will shade in three tenths on the Base Ten flat using a red crayon. Student B will coach if necessary and celebrate the correct answer. Student B will then write the decimal using the decimal point. Student A then coaches if needed and celebrates. Student B then shades in eight tenths on the Base Ten flat using a blue crayon. Student A will coach if needed and celebrate the correct answer. Student A will then write the decimal using the decimal point. Student B coaches if necessary and celebrates the correct answer.

C. Guided Practice:

The teacher will show a Base Ten flat on the overhead. The flat will be shaded to represent a decimal. On a white board, the students will then show the written form of the decimal. The teacher will continue with the process until many examples are shown.

D. Closure: Mix-Freeze-Pair

- The teacher says "Mix!" and students shake hands as they move about the room.
- The teacher announces "Freeze" and students stop.
- The teacher says "Pair" and students find a partner (someone the student doesn't usually work with).
- Partners are given time to discuss a teacher-provided topic using RallyRobin or Timed Pair Share.
 - ✓ Topic 1 – Explain to your partner how decimals can be related to a dollar.
 - ✓ Topic 2 – List in order, starting at ten thousand, the place value of numbers through hundredth.
 - ✓ Topic 3 – Describe how 0.4 would it look on a Base Ten flat.
- Students mix, freeze, and pair again as prompted by the teacher after each topic.

E. Independent Practice: Differentiated Assignment

Advanced Learners:

Students work in pairs to illustrate a picture of ten items (i.e., ten children, ten houses, etc.). The students then use the picture to write decimals and record in their journal (one tenth of the houses have cars in the driveway). Each student will then individually write a paragraph describing the picture and the decimals used.

Proficient Learners:

Students work in pairs. Student A rolls a number cube and models the number as a decimal using Base Ten flats and longs. Student B then rolls and models his/her number using the Base Ten flats. The students record both numbers in their math journals and indicate which decimal is larger (i.e., $.4 < .8$). The students continue until time is called. Each student will then individually write a paragraph describing how they knew which decimal represented the larger amount.

Strategic Learners:

The teacher will give each pair of students a bag with ten unifix cubes. The students will take out the ten cubes and in a journal write the decimal representation for each color cube (i.e., two tenths of the cubes are blue). If time allows, the student pair will use another group of 10 items (i.e., pattern blocks – write the decimal based on the shape).

Intensive Learners:

The teacher will display a Base Ten flat and have the student do the same. Tell the students to cover their flat with longs. Acknowledge that ten longs are needed to completely cover one flat. Elicit that if a flat has the value of one whole or 100, then each long has the value of one tenth. Write 0.1 so the students can see it and explain that this is decimal form. Then write 0.3 and have the students use their blocks to show three tenths. Then give the students Attachment D and have them first cover the flat with longs to show the given decimals and then shade in the correct portion to also show the same decimal using the following: 0.1, 0.5, 0.7 and 0.9.

III. ASSESS:

- A. **Products:**
- B. **Diagnostic (see background):**
- C. **Pre-Assessment:**
- D. **Post Assessment (EOG format plus 2 open-ended)**

IV: RESOURCES:

- A. **Websites:**
- B. **Materials:**
- C. **Professional Development Opportunities:**



Ten Thousands	Thousands	Hundreds	Tens	Ones	•	Tenths	Hundredths
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Place Value Cards

ten thousands	thousands	hundreds	tens
ones	decimal point •	tenths	hundredths

ten thousands	thousands	hundreds	tens
ones	decimal point •	tenths	hundredths

