Deciphering Decimals

Fifth Grade | Math | 45 minutes | Standards: 5.NBT.A.1, 5.NBT.A.3

by Amanda Clarkson | July 17, 2015

In this tactile lesson, students will understand how decimals relate to a whole number by using base 10 blocks in a whole new way!

Learning Objectives

Students will be able to represent a given decimal with base 10 blocks. Students will also be able to correctly pronounce names of decimals and fractions.

Materials and Preparation

- Sets of base 10 blocks per group of 3-4 students
- Graph paper for each student

Lesson

Introduction (5 minutes)

- Show students the flat, rod, and cube from the base 10 block set. Ask students what they think the flat, rod, and cube stand for. Answer: 100, 10, 1.
- Now tell students that for this lesson, the flat equals 1 and stands for the ones place. Ask students to consider what this means the rod and cube would equal. Give students time to discuss this with a partner.
- Have students share their answers. Explain that the rod is equal to one-tenth (1/10) and show how 10 rods fit into a whole. Explain that the cube is equal to one-hundredth (1/100) and show how 100 of them fit into one whole.
- Write a "key" on the board to remind students of the new value of each base 10 block.

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Explicit Instruction/Teacher Modeling *(10 minutes)*

- Draw a place value chart on the board that shows the ones place, tenths place, and hundredths place. Make sure to include a space for the decimal point. Write in the decimal 1.7 in the place value chart. Ask students how they would pronounce this number. Students will be tempted to say the number as a decimal, *one point seven*, but encourage them to say it as a fraction, *one and seven tenths*.
- Show them how you came to this fraction using the place value chart.
- Next, write the decimal 2.05. Again, ask students what number this is. Show students using the chart how to determine that this number is *two and five hundredths*.
- Lastly, write the decimal 0.68. Ask students what number this is. Once again, show students using the place value chart that this number is *sixty-eight hundredths*.
- Now, go back to each decimal. Show students what each one would look like using the base 10 blocks. *For example, 1.7 would be one flat and seven rods.*

Guided Practice/Interactive Modeling *(15 minutes)*

- Divide the class into groups of three to four students.
- Hand out base 10 blocks to groups of students, as well as a piece of graph paper for each student.
- Explain that as a group, students will be working together to represent various decimals using the base 10 blocks. They will record this on their piece of graph paper. Students will also be writing the name of the decimals next to the visual representation.
- Give students the following decimals to represent: 2.5, 0.9, 1.33, 1.03, 0.07.
- Monitor groups of students as they work. Encourage students to use the key at the front of the room to help them with their representations, as well as the place value chart to help them pronounce each decimal.
- Review each answer as a class. Note where group of students may have struggled, and give additional examples if necessary.

Independent Working Time *(10 minutes)*

- Tell students that they will continue representing decimals with base 10 blocks on their own, without the help of a group. They will also continue to practice saying and writing the names of these decimals.
- Give students the following decimals to represent and pronounce: 4.23, 0.9, 2.08, 3.2.
Extend

Differentiation

- **Enrichment:** Ask students to find equivalent decimals for 1.90, 2.40, and 8.70. Students should represent these decimals using base 10 blocks in the simplest way possible and write the names for each equivalent decimal. *For example: 1.90 is equivalent to one and nine-tenths, and can be represented with one flat and nine rods.*
- **Support:** Have students continue to use base 10 blocks during independent time. Students who continue to struggle could be pulled into a small group for more instruction from the teacher.

Review

Assessment

- Use the students' independent work to assess their understanding. Look to see that students have identified place values correctly. *For example, that they've shown nine rods rather than 9 cubes for 0.9.*
- Also look to see that students can correctly pronounce the decimals. Students should be using place value terms in their pronunciations. *For example, "three and two tenths" rather than "three point two" for 3.2.* Check to make sure students are using the correct place value. *For example, "two and eight hundredths" rather than "two and eight tenths" for 2.08.*
- Look for patterns among student work. If many students are misunderstanding the same concept, it can be retaught in future lessons.

Review and Closing **(5 minutes)**

- Ask students where they see decimals used in every day life. *Examples: money, filling up the gas tank.*
- Write "$1.25" on the board. Remind students about how the base 10 blocks represent different decimal place values. Ask students what represents each place value in money. *Ones place: one dollar, tenths place: one dime, hundredths place: one penny.*
- Challenge students to continue looking for decimals around them throughout the day!