



IT ALL ADDS UP

Subject Matter: Math

Grade Level: 4

Time Allotment: One 50-minute class session

Master Teacher: Merrie Hensley

Overview

This lesson provides students with an introduction to adding with decimals.

Learning Objectives

Students will be able to:

- Add decimals through hundredths, with and without carrying.
- Use manipulatives to understand mathematics concepts.
- See the relationship between monetary values and decimals.

Oregon Standards Available at:

<http://www.ode.state.or.us/cifs>

Mathematics – Calculations and Estimations

Compute fluently and make reasonable estimates.

Computation and Estimation

- Add and subtract decimals to hundredths, including money amounts.

Media Components

Video

Check the link at <http://www.opb.org/edmedia/trs/> to find access to the video(s) from unitedstreaming™ referenced in this lesson plan.

- “Zany World of Basic Math, The, Module 6: Working with Decimals” (15:15)
 - **Clip:** “Addition and Subtraction” (02:27)

Web

- **CYBERCHASE**

There are several math games at CYBERCHASE, including this one where students must use their knowledge of decimals to fill in missing parts of a railroad track.

<http://pbskids.org/cyberchase/games/decimals/decimals.html>

Materials**Per Student:**

- A set of decimal manipulatives. If pre-made ones are not available, you can cut some from graph paper. Use centimeter paper and cut it into 10 columns of 10 squares each. Then cut two of those columns into 10 squares each. You will then have eight tenths (the columns) and 20 hundredths (the squares).
- Decimal Worksheet (located at end of lesson plan)

Per Class and/or Group:

- Computer hooked up to TV or projector with speakers
- Access to a dry erase board or chalkboard

Prep for Teachers

When using media, provide students with a **Focus for Media Interaction**, a specific task to complete and/or information to identify during or after viewing of video, Web sites or other multimedia elements.

Download the video clip listed above. You can obtain a free copy of the Windows Media Player on the Web that will make viewing the downloaded clip much more convenient and versatile. QuickTime Player can also be downloaded and used for viewing most video clips.

If pre-made decimal manipulatives are not available, prepare them as described above in “Materials per Student.”

Introductory Activity

Step 1: Ask students the following question: “If you had 13 cents, and someone gave you 7 more cents, how many cents would you have?” Tell them they are going to check their answers by adding decimal manipulatives.

Step 2: Explain that each small square in their manipulative set is the equivalent of one hundredth and that each column of 10 hundredths is the equivalent of one tenth.

Step 3: Write the decimals to be added on the board: 0.13 and 0.07. Refer to these numbers as 13 hundredths and seven hundredths.

Step 4: Tell students to show you 13 hundredths by setting out one tenth (column) and three hundredths (squares).

Step 5: Tell them to now show you seven hundredths by setting out seven of the little squares.

Step 6: Now have students put the two sets together to show 20 hundredths or two tenths.

Step 7: Show the addition on the board using dollar signs and explain that 20 hundredths is the same as 20 cents.

Step 8: Repeat Steps 3-6 with the numbers 0.29 and 0.36. Ask students how these manipulatives help them understand. Example answer: *I can see what it means to group singles together to form tens when I add decimals.* Set manipulatives aside.

Learning Activities

Step 1: Make sure the video clip, “Addition and Subtraction” (02:27), from the video, “Zany World of Basic Math, The, Module 6: Working with Decimals” (15:15), is ready to play.

Step 2: Before playing the video, provide students with a **Focus for Media Interaction** by having them watch for what they should do with the decimal point when they are adding decimal numbers.

Step 3: **Play** the video. **Pause** the video just after the narrator says, “... carrying when needed ...” (00:29) and ask students to raise their hands if they think they know what to do with decimal points when adding decimals. Call on a student.

Step 4: Give a new **Focus for Media Interaction** by asking students to watch for when it is okay to add or drop zeros when dealing with decimals.

Step 5: **Resume play** and then **pause** after the narrator says, “... to the left of the decimal ...” (01:11). Have a student come to the board and show an example of when zeros can be added to a decimal without changing its value; for example: 15.3(0). Ask a different student to show an example where a zero cannot be added; for example: 23(0).43.

Step 6: Give a final **Focus for Media Interaction** by asking students to watch to learn what to do when you need to carry a number when adding decimals.

Step 7: **Resume play** and at the video’s completion (02:27), ask a volunteer to explain how carrying is handled when adding decimals (just as it is when adding regular integers).

Step 8: Have students now combine their manipulatives with a partner and then repeat Steps 3-6 of the Introductory Activity with the numbers 0.89 and 0.43. Have a student do the problem on the board, making sure the decimals are lined up properly.

Step 9: Have students do several problems with manipulatives, each time having at least one student come to the board to show the algorithm. Students may need to combine several sets of manipulatives for larger numbers.

Culminating Activity

As a class, play an Interactive Web game by showing it over a projector or television. Before going to the Web site, <http://pbskids.org/cyberchase/games/decimals/decimals.html>, give students a **Focus for Media Interaction** by telling them they are going to need to choose pieces of railroad track, labeled with decimals, to repair a track in the game so the train can complete its run. Ask them to look for combinations of decimals they can *add* to fix the railroad track, instead of using solid pieces of track. While playing the game at this Web site, each time the train pauses, call on a new student to give a combination of decimals that could be used to fix the track. Check for comprehension by watching to see if students choose decimals that add up to the correct piece of missing train track. Check for further understanding by assigning a set of problems to complete independently, such as the Decimal Worksheet attached at the end of this lesson plan.

Cross-Curricular Extensions

Physical Education

- Using a stopwatch that shows hundredths of a second, time the students in a relay race. Have them add their individual times to those of their teammates. In addition to practicing adding decimals, they will be practicing adding time.

Science

- During a study of weather and barometric pressure, have the students use their knowledge of adding decimal numbers to find the average barometer reading over a week's time.

Community Connections

- Ask a representative from a bank to come in to talk to the students about the importance of correctly adding amounts deposited or withdrawn from a bank.
- Ask an area meteorologist to visit the class to discuss the role of decimals in weather forecasting.

Decimal Worksheet

Name _____

$$\begin{array}{r} 4.67 \\ + 8.12 \\ \hline \end{array}$$

1)

$$\begin{array}{r} 3.75 \\ + 48.83 \\ \hline \end{array}$$

2)

$$\begin{array}{r} 22.47 \\ + 55.65 \\ \hline \end{array}$$

3)

$$\begin{array}{r} 11.38 \\ + 84.05 \\ \hline \end{array}$$

4)

$$\begin{array}{r} 28.39 \\ + 11.02 \\ \hline \end{array}$$

5)

$$\begin{array}{r} 61.92 \\ + 29.16 \\ \hline \end{array}$$

6)

$$\begin{array}{r} 23.23 \\ + 26.77 \\ \hline \end{array}$$

7)

$$\begin{array}{r} 66.04 \\ + 19.58 \\ \hline \end{array}$$

8)

$$\begin{array}{r} 35.75 \\ + 24.09 \\ \hline \end{array}$$

9)

$$\begin{array}{r} 1.97 \\ + 77.17 \\ \hline \end{array}$$

10)

$$\begin{array}{r} 28.11 \\ + 56.66 \\ \hline \end{array}$$

11)

$$\begin{array}{r} 6.62 \\ + 24.08 \\ \hline \end{array}$$

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