

Grade 4

Unit 3.3	Unit Title Understanding Decimals	Lesson 1 of 2	Day 1-9
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Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
<p>4.NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.⁴ <i>For example, express 3/10 as 30/100, and 3/10 + 4/100 = 34/100.</i>⁴</p> <p>⁴Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.</p> <p>4.NF.6 Use decimal notation for fractions with denominators 10 or 100. <i>For example. Rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i></p>	<ul style="list-style-type: none"> •Express a fraction in tenths as an equivalent fraction in hundredths and visa versa. •Use equivalent fractions to relate tenths and hundredths. •Add two fractions with respective denominators of 10 and 100. •Use decimal notation for fractions with denominators of 10 or 100. 	<p>SMP2 Reason abstractly and quantitatively.</p> <p>SMP6 Attend to precision.</p> <p>SMP7 Look for and make use of structure.</p>	<p>How can you express seven tenths as a fraction with a denominator of 100?</p> <p>How can you add fractions when one of the fractions has a denominator of 10 and the other has a denominator of 100?</p> <p>How can you record tenths and hundredths as fractions and decimals?</p> <p>How can you relate fractions, decimals and money?</p>
5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
<ul style="list-style-type: none"> •Understand place value •Use the relationship $\frac{a}{b} = \frac{(n \times a)}{(n \times b)}$ to generate equivalent fractions. •Record hundredths and tenths as fractions & decimals. •Add fractions with like denominators. •Record tenths and hundredths as fractions & decimals. •Represent and locate fractions on a number line. •Write a fraction to represent a part of a whole that is divided into equal parts. •Know the value of a penny, a nickel, a dime, a quarter, and a \$1 bill. •Understand the relationship among the values of coins and a \$1 bill. •Record tenths and hundredths as fractions and decimals. 	<p>Equivalent fraction Equivalent decimal Decimal Tenth Hundredth</p>	<ul style="list-style-type: none"> •Students often write 0.090 for ninety hundredths instead of 0.90. They confuse whole number place value with decimals thinking hundredths is three places from the decimal point. •When adding decimals, student does not look at place value. (Ex: when adding .3 + .40 will say total is .43 rather than the correct total of .70.) similarly, •When adding fractions will just add numerators (Ex: 3/10 and 40/100 as 43/100) 	<p>OnCore Lessons 70 and 71 Student pp. 139-142 Please Note: Lessons 70 & 71 are said to be standard CC4.NF.5, but they also address CC4.NF.6 decimal equivalents</p> <p>K-5 Math Resources Sums of 1 Equivalent Fractions with a Denominator of 100 Problems</p> <p>OnCore Lessons 72-74 Student pp. 143-148 Investigations Unit 6- Session 3.1 SAB. pp.44, 45, 50, and 51 Decimals in Money Representing Decimals with Base 10 Blocks Decimal Riddles Metric Relationships □</p>

Instruction

9. Instruction Practices (What are the teachers doing)

Teachers will guide children to record tenths and hundredths as fractions and decimals, add fractions when the denominators are 10 or 100, and translate among representations of fractions, decimals, and money following the lesson guidelines in OnCore lessons 70-74 (TM pp.73-77), teachers will:

- Helps students apply their knowledge of place value experiences of grouping 10 ones to make 1 ten and 10 tens to make 1 hundred to writing equivalent fractions and decimals. Review the term equivalent fraction. Remind students that they have learned how to add fractions with a common denominator. Review how to write decimals for tenths and hundredths as fractions and how to write a fraction such as $\frac{3}{10}$ as a number of hundredths. Make sure students understand that they can only add fractions with like denominators and that is why it is necessary to find equivalent fractions. Point out that answers to the problems should be in the same form as the addends, fractions, decimals, or money amounts.
- Review how fractions are used to represent a part of a whole and how to represent a point on a number line. Remind students that a fraction can only be written if the whole is divided into equal parts. Make sure students are aware that they should write a 0 in the ones place for decimals less than 1 (i.e. 0.2).
- Note: In lesson 73 you are asked to check understanding by asking students to give both fraction and decimal names for a model that represents a number greater than 1. (i.e. 1.54 or $1\frac{54}{100}$)
- Check to see that students understand they must write 0 in the tenths place for the fraction $\frac{9}{100}$.
- Review the values of coins, pennies, nickels, dimes, quarters, and a \$1 bill. Ask students to describe some relationships among the coins and the bill, such as 2 nickels =1 dime. Explain that money amounts are related to fractions (part of a dollar- 1 dime is $\frac{1}{10}$ of a dollar) and to decimals (tenths and hundredths – 1 dime is a tenth of a dollar). In both cases the dollar is the whole, and they are learning to represent money amounts as fractional parts of that whole. Discuss that one cent is one hundredth of a dollar (the prefix “cent” means hundred and on the penny coin are the words “one cent”). Remind students to use the dollar sign and decimal point notation when writing a money amount.

(Please note OnCore lessons 70 and 71 include decimal equivalents and coins. These are not part of the standard for 4.NF.5 as stated in the book, but they do address 4.NF.6 which is the other standard being addressed now.)

Teachers will be following lesson activities from Investigations Unit 6 session 3.1 and 3.3 materials. (TM pp. 104-110) and 116-119 In the activities teachers will: Call attention to the word decimal and give students the meaning of decimal as 10 and remind them that our number system is based on tens. Go over everyday uses of fractions and decimals and have students come up with as many examples as they can in 5-10 minutes. For some students referring to a context helps them visualize and talk about decimal fractions. Give students a copy of Decimal Grids and go over how many parts are shaded for different amounts of tenths and hundredths. (Please note that this standard is for 10ths and 100ths only and there is also a grid for 1000ths. You need only refer to the 10ths and 100ths grids.)

•Teachers may use the activities from K-5 Math Resources.

10. Learning Practices (What are the students doing)

In OnCore lessons 70-74 students will:

- Record tenths and hundredths as fractions and decimals.
- Find equivalent fractions and decimals.
- Add fractions when the denominators are 10 and 100.
- Relate tenths and hundredths to decimals.
- Relate fractions, decimals, and money.
- Write money amounts as decimals.
- Use correct dollar sign and decimal notation for money amounts.
- Complete student pp.139-148.

In Investigations Unit 6 Session 3.1 and 3.3 students will:

- List examples of a fraction or decimal that they see at home, at the store or somewhere else.
- Represent decimal numbers on a grid.
- Represent decimal numbers in tenths and hundredths on both Grids A and B to show equivalent decimals (tenths and hundredths).

In K-5 Math Resources students will:

- Use tenths and hundredths number cards to find sums of 1.
- Solving word problems with equivalent fractions having denominators of 10 and 100.
- Counting, recording and comparing amounts of money.
- Represent Decimals with Base 10 Blocks.
- Solve decimal riddles.
- Show metric relationships among centimeter, decimeter, and meter.

Grade 4

Unit 3.3	Unit Title Understanding Decimals	Lesson 2 of 2	Day 10-13
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Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole.	SMP6 Attend to precision.	How can you compare two decimals? How can you use a model to show that one fraction is larger than another? What does the digit in the tenths place mean? What does the digit in the hundredths place mean?
5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
<ul style="list-style-type: none"> • Compare whole numbers. • Use the symbols $<$, $>$, and $=$ to represent comparisons. • Record a decimal in tenths as hundredths. 		<ul style="list-style-type: none"> • Students may compare numerators only without regard for the denominator. 	OnCore Lessons 75 Student pp. 149-150 Investigations Unit 6- Session 3.2 RM 27 -28 and SAB. p. 55 Unit 7-SAB pp.2, 25, 37 K-5 Math Resources —activities for 4.NF.7 Comparing Decimals Decimal Sort

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will guide children to compare decimals to hundredths by reasoning about their size following the lesson guidelines in OnCore lessons 75 (TM p78), teachers will: Review how to use a number line to compare two whole numbers, stressing that the greater number is the number located farther to the right. Also review how to compare two fractions by modeling each as part of the same whole and comparing the sizes of the parts. Explain to the students that they will see how to use these same methods to compare two decimals. Be sure that students are aware that 0.1, 0.2, and 0.3 represent 0.10, 0.20, and 0.30. Also be sure to see that students see it is not possible to just compare 2 and 23 in $\frac{2}{10}$ and $\frac{23}{100}$ because tenths and hundredths are not equal parts. Make sure that students are interpreting the $>$ and $<$ symbols correctly. Teachers will be following lesson activities from Investigations Unit 6 session 3.2 materials. (TM pp. 111-115) In the activities teachers will: Guide students through reasoning about representations and meanings of numbers with the purpose of ordering decimals and justify their ordering. <ul style="list-style-type: none"> • Teachers may use the activities from K-5 Math Resources. 	In OnCore Lesson 75 students will: <ul style="list-style-type: none"> • Use a number line to compare decimals • Correctly use the symbols $>$ and $<$ when comparing decimals. • Decide if the shown inequalities are true or false. • Complete student pp.149-150. In Investigations Unit 6 Session 3.2 students will: <ul style="list-style-type: none"> • Play the game Decimal Compare. • Correctly use the symbols $>$ and $<$ when comparing decimals. • Explain their reasoning for deciding which decimal is greater. • Complete SAB. p. 55 and Unit 7-SAB pp.2, 25, 37 In K-5 Math Resources students will: <ul style="list-style-type: none"> • Compare decimals using base 10 blocks. • Sort decimal as near 0, about $\frac{1}{2}$, and close to 1.