

Mrs. Sanford's 5th Grade Decimal Study Guide

I highly recommend that you create a username and password for Learn Zillion. It is free and there are video lessons to help with every math standard. I link to those videos throughout this webpage.

Place Value

Place Value Vocabulary		
place value - the position of a digit in a number (ex. In 4.345, the 5 is in the thousandths place.) Place value is a word.	value - what an individual digit is worth in a number (ex. in 4.345, the value of the 3 is 0.3, or $\frac{3}{10}$.) Value is a number.	digit - a symbol used to make a numeral (ex. 8 is a digit that makes up the number 568.) Just as letters make words, digits make numbers.
standard form - the most common way to write a number (ex. 435,678)	expanded form - writing a number to show the value of each digit (ex. $4.345 = (4 \times 1) + (3 \times 0.1) + (4 \times 0.01) + (5 \times 0.001)$)	word form - A number written out in words (ex. 4.345 = four and three hundred forty five thousandths)
model - showing a number using base ten blocks, number lines, or another method.	decimal - a point between a whole number and a decimal fraction	compare - tell whether a number is greater than, less than, or equal to another number
tenths - one part in ten equal parts (ex. $\frac{1}{10}$, 0.1)	hundredths - one part in one hundred equal parts (ex. $\frac{1}{100}$, 0.01)	thousandths - one part in one thousand equal parts (ex. $\frac{1}{1000}$, 0.001)
greater than - $>$ (ex. 5.5 is greater than 5.4; $5.5 > 5.4$)	less than - $<$ (ex. 5.4 is less than 5.5; $5.4 < 5.5$)	equal to - $=$ (ex. 5.50 is equal to 5.5; $5.50 = 5.5$)

Concepts:

Decimal Place Value (position) and Value (worth)

Ones	Decimal (and)	tenths	hundredths	thousandths
4	●	3	2	5

The 4 is in the ones place. The value of the 4 is 4. The 3 is in the tenths place. The value of the 3 is 0.3.

The 2 is in the hundredths place. The value of the 2 is 0.02. The 5 is in the thousandths place. The value of the 5 is 0.005.

Video Lesson for place value of decimals: <http://studyjams.scholastic.com/studyjams/jams/math/decimals-percents/place-value-decimals.htm>

Game to practice decimal place value:

- Paper Boy Place Value: http://www.sheppardsoftware.com/mathgames/decimals/scooter_QUESTDecimal.htm
- Pirate Place Value: <http://mrmussbaum.com/placevaluepirates1/>

Video Lesson for reading decimals:

<https://learnzillion.com/lessons/428-name-decimals-through-the-thousandths-place>

Game for practice with reading decimals:

- Decimals of the Caribbean: <http://mrmussbaum.com/docrb1/>

Standard form, word form, and expanded form:

Standard Form	Expanded Form	Word Form
0.034	$(3 \times 0.01) + (4 \times 0.001)$	Thirty-four thousandths
5.67	$(5 \times 1) + (6 \times 0.1) + (7 \times 0.01)$	Five and sixty-seven hundredths

8.9	$(8 \times 1) + (9 \times 0.1)$	Eight and nine tenths
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Writing Decimals in standard form: Standard form is the common way we write numbers. For example, five and twenty-three hundredths is

5.23 in standard form.

Writing Decimals in Expanded Form: In the past grades, expanded form has been simpler. For 456, you would write $400 + 50 + 6$. In fifth grade, the complexity of expanded form changes. Each written value is broken down even further, adding in a multiplication component.

Now, 456 would look like this: $(4 \times 100) + (5 \times 10) + (6 \times 1)$ Let's look at a decimal number in 5th grade expanded form. For instance, 4.567 in expanded form could look like this:

$$(4 \times 1) + (5 \times 0.1) + (6 \times 0.01) + (7 \times 0.001)$$

$$\text{or this: } (4 \times 1) + (5 \times \underline{\quad}) + (6 \times \underline{\quad}) + (7 \times \underline{\quad})$$

- Video Lesson for expanded form: <https://learnzillion.com/lessons/429-write-decimals-in-expanded-notation>

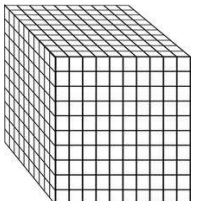
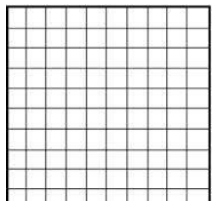
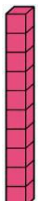


Writing Decimals in Word Form: When you write a decimal number in word form you simply read the decimal and write what you say. For example, if I see the decimal 5.673, I would read the decimal to myself, remembering that I say "and" when I come to the decimal point, and write what I say. 5.673 in word form would be five and six hundred seventy-three thousandths.

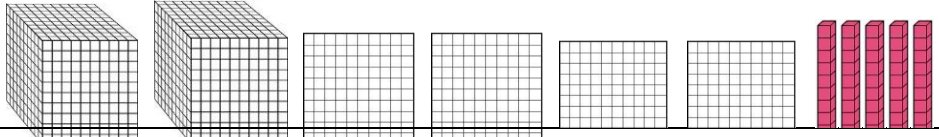
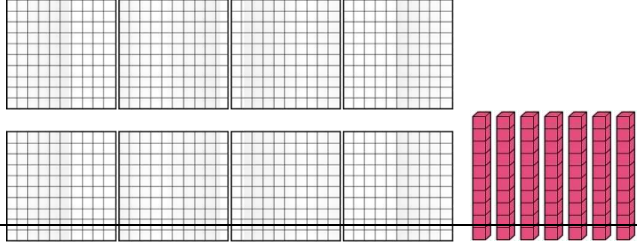
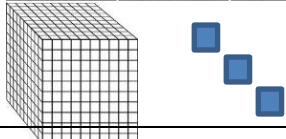
123.456	
4.009	
35.301	
793.210	

Modeling Decimals with Base-ten Blocks:

You can model decimals using base-ten blocks. Here is how:

If we are modeling a decimal that goes to the thousandths place, the base ten blocks would represent different values. To represent one whole, we would use the large cube as one whole, the "flat" as one tenth, the "long" as one hundredth, and the small cube as one thousandth.

<p>Large Cube:</p>  <p style="text-align: center;">1 whole 1</p>	<p>Flat:</p>  <p style="text-align: center;">1 tenth 0.1 or 1/10</p>	<p>Long:</p>  <p style="text-align: center;">1 hundredth 0.01 or 1/100</p>	<p>Small Cube:</p>   <p style="text-align: center;">1 thousandth 0.001 or 1/1000</p>
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2.456	
0.870	
1.003	

- Video Lesson for Decimal Models: <https://learnzillion.com/lessons/3776-read-and-write-decimals-using-base-ten-blocks>
- Games/Practice for practicing decimal models:
 - Decimals to Tenths Place: <http://www.sheppardsoftware.com/mathgames/decimals/DecimalModels10.htm>
 - Decimals to Hundredths Place: <http://www.sheppardsoftware.com/mathgames/decimals/DecimalModels.htm>
 - Decimals to Thousandths Place:

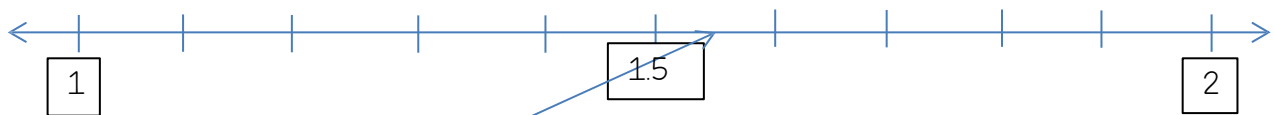
Model the following decimals using base ten blocks on paper: 6.678

1.340

2.522

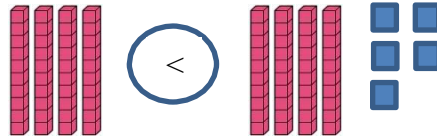
Showing Decimals on a Number Line:

Decimals can be placed on a number line just like whole numbers. For example, 1.5 would fall here on the number line:



1.55 would fall here:

- Video lesson for placing decimals on a number line:
<http://studyjams.scholastic.com/studyjams/jams/math/decimals-percents/place-decimal-number-line.htm>
- Game for placing decimals on number line:
http://www.sheppardsoftware.com/mathgames/decimals/mathm_an_decimal_numberline.htm



- Video Lesson for Comparing Decimals with Models: <https://learnzillion.com/lessons/564-compare-decimals-using-base-ten-blocks>

4. Tricks for quickly comparing decimals: Now that you have an understanding of the strategies you can use to compare decimals, here are some quick ways:

- "Balancing out" the numbers - It can look difficult when having to compare decimals that go to different place values. For example, you might be asked to compare 1.45 and 1.451. To easily compare these decimals, you can make them look similar by adding a zero to the end of the decimal with fewer places.

$$1.450 < 1.451$$

Adding a zero will not change the value of the decimal because $45/100$ is the same amount as $450/1000$.

Now both decimals look similar, and you can easily tell that four hundred fifty thousandths is less than four hundred fifty-one thousandths.

- "Cross-out Method" - this method can be useful when comparing decimals or whole numbers. In this method, you examine each place value carefully and cross out the place values that match from left to right. For example, let's compare 0.009 and 0.09.

$$\cancel{0.0}09 < \cancel{0.0}9$$



If we cross out the matching place values first, we would cross out the ones place on both numbers because they are both zero, and the tens place on both numbers because they are both zero. Now we are looking at a zero in the hundredths place of the first number, and a nine in the hundredths place of the second number. Since zero hundredths is less than nine hundredths, 0.009 is less than 0.09.

- Game for Comparing Decimals: <http://www.sheppardsoftware.com/mathgames/decimals/CompareDecimals.htm>

Ordering Decimals:

Once you have learned how to compare decimals, you can put them in order from least to greatest or from greatest to least as well. Watch the following videos to see how to order decimals:

<https://learnzillion.com/lessons/34-compare-and-order-simple-decimals>

<https://learnzillion.com/lessons/35-compare-and-order-decimals-to-the-thousandths-place>

Rounding Decimals to Any Place:

You may be asked to round a decimal number to the nearest whole number, to the nearest tenth, to the nearest hundredth, or to the nearest thousandth.

You can round decimal numbers by using a number line.

Click on the following links to see how to round decimals using a number line:

- Round decimals to the nearest whole number: <https://learnzillion.com/lessons/3430-round-decimals-to-the-nearest-whole-number>
- Round decimals to the nearest tenth: <https://learnzillion.com/lessons/3432-round-decimals-to-the-nearest-tenth>
- Round decimals to the nearest hundredth: <https://learnzillion.com/lessons/3322-round-decimals-to-the-nearest-hundredth>
- Round decimals to the nearest thousandth, or any other place:
<https://learnzillion.com/lessons/3522-round-decimals-to-any-place>

You may also use another strategy to round decimals. For example, let's round 3.456 to the nearest tenth.

Step one: Underline the place you are rounding to

3.456

Step two: Circle the place to the right of the underlined place

3.456

Step three: If the circled number is 4 or less, then the underlined number stays the same. If the circled number is 5 or more, then the underlined number increases by one.

3.456
↑
0

Step four: The numbers to the right of the underlined number change to zeros, and the numbers to the left of the underlined number stay the same. Answer: 3.500 or 3.5

Games for Rounding Decimals:

http://www.sheppardsoftware.com/mathgames/decimals/scooter_QuestDecRound.htm

<http://www.math-play.com/rounding-decimals-game-1/rounding-decimals-game.html>