



Core Focus

- Reviewing decimal fractions (tenths and hundredths)
- Representing, reading, and writing decimal fractions (to thousandths)
- Locating decimal fractions on a number line and writing them in expanded notation
- Comparing, ordering, and rounding decimal fractions
- Investigating number patterns (using equations and input-output tables to describe patterns)

Decimal Fractions

- Students review how decimals involving tenths and hundredths are written, and how they can be represented on a numeral expander, on a number line, and by shading portions of a unit square divided into 100 parts.
- Students visualize how place value in our number system moves smaller and smaller (always by a factor of one-tenth) as we move to the right in writing numbers, and larger and larger (always by a factor of ten) as we move left in writing numbers.

Step In **Reviewing Decimal Fractions (Tenths and Hundredths)**

What do you know about common fractions and decimal fractions? How are they similar? How are they different?

This large square represents one whole. Color parts to match the number on the expander below.

0 ones 4 tenths 0 hundredths

0 ones 4 tenths 0 hundredths

What common fractions could you write to match 0.4? How do you know? Color more parts to show a total of 0.75 shaded. What common fraction could you write to match?

On this number line, the distance between each whole number is one whole.

In this lesson, students use familiar models, such as the number line, numeral expanders, and the hundred grid, to work with decimal fractions.

Step In **Writing Decimal Fractions Using Expanded Notation**

How do you say the decimal fraction on this closed expander? **3.805**

What mixed number could you write to match?

How would you describe the value of each digit?

Cathy wrote the decimal fraction with expanded notation. She wrote the expanded notation in two different ways.

Method A $(3 \times 1) + (8 \times 0.1) + (5 \times 0.001)$ **Method B** $(3 \times 1) + (8 \times \frac{1}{10}) + (5 \times \frac{1}{1000})$

Does each method give you the same sum? How do you know? Why are the hundredths not expanded?

Anoki knew another way to write the decimal fractions with expanded notation. He wrote the decimal fraction like this.

Method C $3(1) + 8(0.1) + 5(0.001)$

Which method do you prefer? Why? How could you use Anoki's method with common fractions?

In this lesson, students explore different ways to decompose decimal fractions involving thousandths.

Ideas for Home

- Talk about the price of items when shopping. Our monetary system gives your child real-world connections to decimal fractions with tenths and hundredths.
- Look up the batting averages of your child's favorite baseball team and compare the averages for players. Practice reading the averages out loud. An average of 0.314 is read as "three hundred fourteen thousandths".

Glossary

- This table shows the different representations for **decimal fractions**.

Fraction Words	Ones	Tenths	Hundredths	Thousandths	Decimal Fraction	Common Fraction
one-tenth	0	1	0	0	0.1	$\frac{1}{10}$
one-hundredth	0	0	1	0	0.01	$\frac{1}{100}$
one-thousandth	0	0	0	1	0.001	$\frac{1}{1000}$

- A **numeral expander** names the value of each digit in a decimal fraction (tenths, hundredths, thousandths).

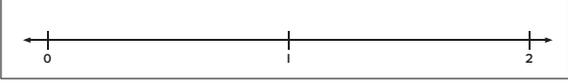


- Students compare and order decimal fractions with up to three decimal places (tenths, hundredths, and thousandths), just like they earlier learned to compare and order whole numbers.
- Thinking about where the decimal fractions would be on a number line helps when comparing, as does imagining a picture (a square divided into tenths and hundredths).
- Students pay attention to place value to compare like quantities. Comparing 0.6 and 0.583 as thousandths (i.e. 0.600 and 0.583) helps students see that 0.6 is greater than 0.583.

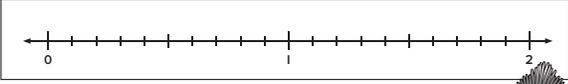
Step In **Rounding Thousandths**

On this number line, the distance between each whole number is one whole. Where would you show this decimal fraction on the number line?

1.391



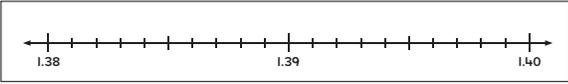
What is the nearest whole number? How do you know?
Mark the same decimal fraction on this number line. Be as accurate as possible.



What is the nearest tenth? How do you know?

1.391 is very close to 1.4.

The number line below shows thousandths. What numbers are between 1.39 and 1.40?



In this lesson, students round decimal fractions with three decimal places to the nearest whole number, tenth, or hundredth.

Algebraic Thinking

- In the earlier grades, students were introduced to number patterns using pictures, tables, number sentences, and word rules.
- Students will extend their skills to include representing number patterns and equations in the study of algebra.

Step In **Working with Algebraic Expressions**

Noah plans to buy some packs of nails. There are 125 nails in each pack. If he buys 3 packs, how many nails will he have?



What equation would you write to figure out the total number of nails for any number of packs?

I would write it as:
125 × number of packs = total nails
or
total nails = 125 × number of packs

When letters are used to represent numbers, the multiplication symbol can be left out so it is not mistaken for the letter X.

If **P** means **Number of Packs** and **N** means **Number of Nails**, these equations could be used to figure out the total number of nails for any number of packs.

125P = N
or
N = 125P

If the number of packs is 4, then $N = 125 \times 4$.
If the number of packs is 8, then $N = 125 \times 8$.

If the number of packs is 20, then what will N equal?

N = ×

In this lesson, students write an equation using letters to represent numbers.

Ideas for Home

- Use situations such as baking for fairs or parties to identify a pattern that grows from one item to the next, and ask what the next two will look like. E.g. 1 jar of jelly needs 8 strawberries, 2 jars need 16 strawberries. Ask your child to continue the pattern to 10 jars of jelly.
- Use craft situations to write equations — e.g. buying beads to make a necklace. 1 **P**ack has 100 **B**eads. You need to buy 5 packs to make 10 necklaces. Ask your child to write an equation to figure out the total number of beads needed for 10 necklaces. $100P = B$ so for 5 packs $B = 100 \times 5$.
- Race results from your local high school's swim and track meets are reported in decimal fractions. Ask your child to read and compare the athletes' times.

Glossary

- When letters are used to represent numbers, the multiplication symbol can be left out so it is not mistaken for the letter X.
- Inputs** are your starting numbers. **Outputs** are the result of a change to the inputs. The relationship between an input and output can be described as a **process** or a **rule**.