

**Home Connection**

In Dimensions 2B and 3B, students were introduced to two-place decimal representations informally through calculations with money. In 4<sup>th</sup> grade, decimals are formally introduced.

Just as there are places to the left of ones in a place value chart, there are places to the right. We separate numbers to the right of the ones place with a decimal point.

In the pictures below, it is shown that to the left of the decimal, each place value increases by 10 times its original value, while numbers to the right of the decimal decrease by one tenth the value each time.

Hundreds	Tens	Ones	Tenths	Hundredths

A place value chart with five columns: Hundreds (orange), Tens (red), Ones (grey), Tenths (tan), and Hundredths (green). The chart is empty. Pink arrows point from right to left between adjacent columns, each labeled with  $\times 10$ . The arrows are: from Hundredths to Tenths, from Tenths to Ones, from Ones to Tens, from Tens to Hundreds, from Hundredths to Ones, from Ones to Tens, and from Tenths to Hundreds.

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A place value chart with five columns: Hundreds (orange), Tens (red), Ones (grey), Tenths (tan), and Hundredths (green). The chart is empty. Pink arrows point from left to right between adjacent columns, each labeled with  $\div 10$ . The arrows are: from Hundreds to Tens, from Tens to Ones, from Ones to Tenths, from Tenths to Hundredths, from Hundreds to Tenths, from Tens to Hundredths, and from Ones to Hundredths.

Decimals less than one will always have the zero in the ones place for clarity.

**Reading Decimal Numbers**

There are two forms of reading decimals.

0.3 may be read as “three tenths”. When we read emphasizing the place value (three tenths) this is a great way to connect decimals and fractions. They can recognize that we read both 0.3 and  $\frac{3}{10}$  as “three tenths”.

The second way to read 0.3 is “zero point three”. This method will come in handy when students need to read longer decimals numbers.

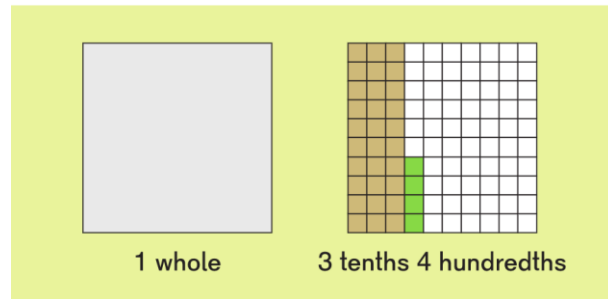
## Representing Decimals

Decimals can be visually represented in a variety of ways; hundredths grid, place-value charts, and number lines.

Example: 1.34

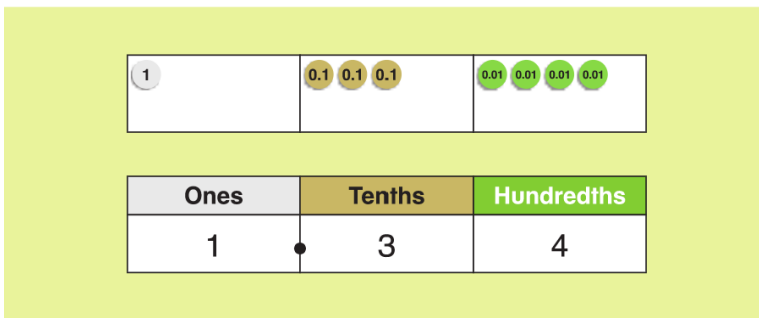
Using hundredths grids, students can easily see

$$1.34 = 1 + \frac{3}{10} + \frac{4}{100}$$

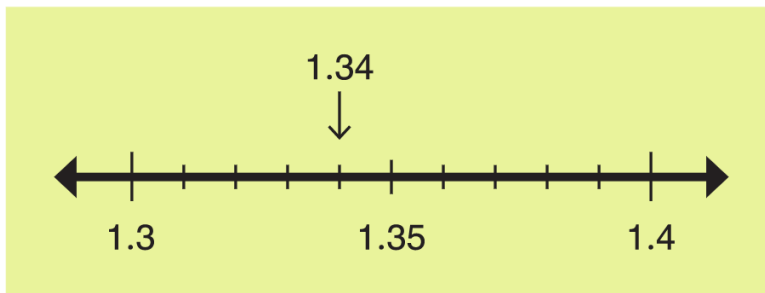


that:

Place value representations will also be used. These are more abstract than the hundredths chart.



Decimals can also be represented on a number line. This allows them to see the decimal number in relation to other decimal numbers and whole numbers.



## Understanding Decimals as Fractions with Denominators of 10 or 100

Students will learn to express decimals as equivalent fractions with denominators of 10 and vice versa. They will also express improper fractions and mixed numbers with denominators of 10 as decimals.

Expanded form will be used in this chapter to show the place values of each digit:

$$\text{Example: } 3.78 = 3 + \frac{7}{10} + \frac{8}{100}$$

Students will also learn how to express decimals as fractions in tenths or hundredths and then simplify. All denominators at this level will be factors of 100: 1, 2, 4, 5, 10, 20, 25, 50, 100.

Example:

$$0.8 = \frac{8}{10} = \frac{4}{5}$$

$\div 2$

$$\frac{4}{25} = \frac{16}{100} = 0.16$$

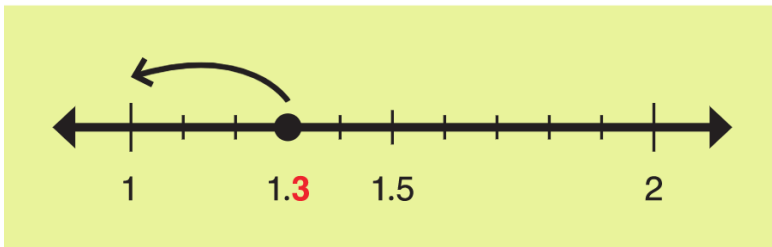
$\times 4$

### Comparing and Rounding

In 3<sup>rd</sup> grade students learned to round whole numbers to specific place values by looking at the digit one place to the right. They know that if that digit is 5 or greater, they round up, and if it's less than 5, they round down. Students will round decimal numbers the same way. To round to the nearest whole number, they will look at the digit in the tenths place, and to round to the nearest tenth, they will look at the digit in the hundredths place.

Example:

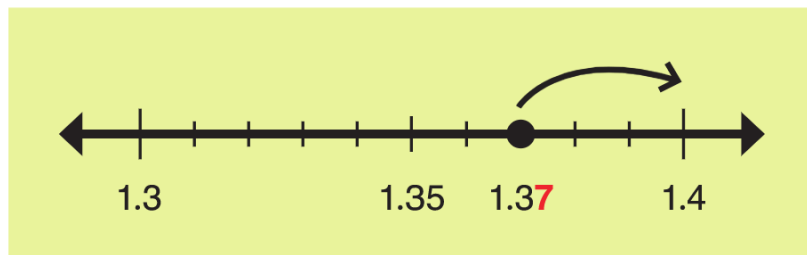
Round 1.3 to the nearest whole number.



We can see that 1.3 is between the whole numbers of 1 and 2. Because 1.5 is halfway between 1 and 2, and 1.3 is less than 1.5, we will round down to 1.

Example:

Round 1.37 to the nearest tenth.



We can see that 1.37 is between 1.3 and 1.4 (tip: it may be easier for a student to write 1.30 and 1.40 because they already know that 37 is between 30 and 40). Because the digit 7 in the hundredths place is greater than 5, we will round up to 1.4.

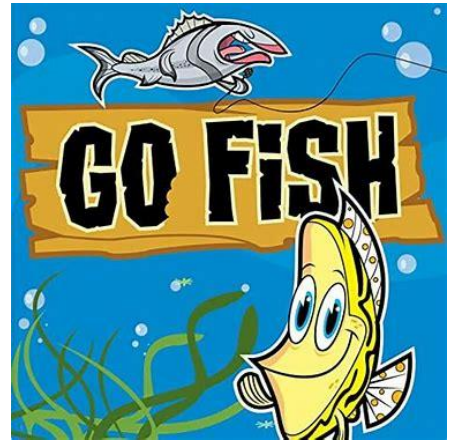
## What Can We Do At Home?

### Go Fish For 1 Game

#### Materials:

Printable game cards: You can print the game cards at the end of this lesson, or you can make your own set at home by using index cards. Write 0.1 on six cards, 0.2 on six cards, 0.3 on six cards, and so on up until 0.9. So you will have a stack of 54 cards in total.

The game works best with 3 or 4 players. Shuffle and deal each player six cards and place the remaining cards face down in draw pile.



Players take turns asking for a number that, when paired with a card they are holding, makes 1.

When player 1 has a pair of cards that make 1, he lays them down. If Player 1 asks for a card and the opponent asked does not have it, the opponent says, “go fish” and Player 1 draws a card from the draw pile. Play continues clockwise. The first player to pair all of their cards is the winner.

0.1

0.2

0.1

0.2

0.1

0.2

0.1

0.2

0.1

0.2

0.1

0.2

0.3

0.4

0.3

0.4

0.3

0.4

0.3

0.4

0.3

0.4

0.3

0.4



0.5

0.5

0.5

0.5

0.5

0.5

0.6

0.7

0.6

0.7

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0.7

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0.7

0.6

0.7

0.8

0.9

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0.8

0.9