CHAPTER

11

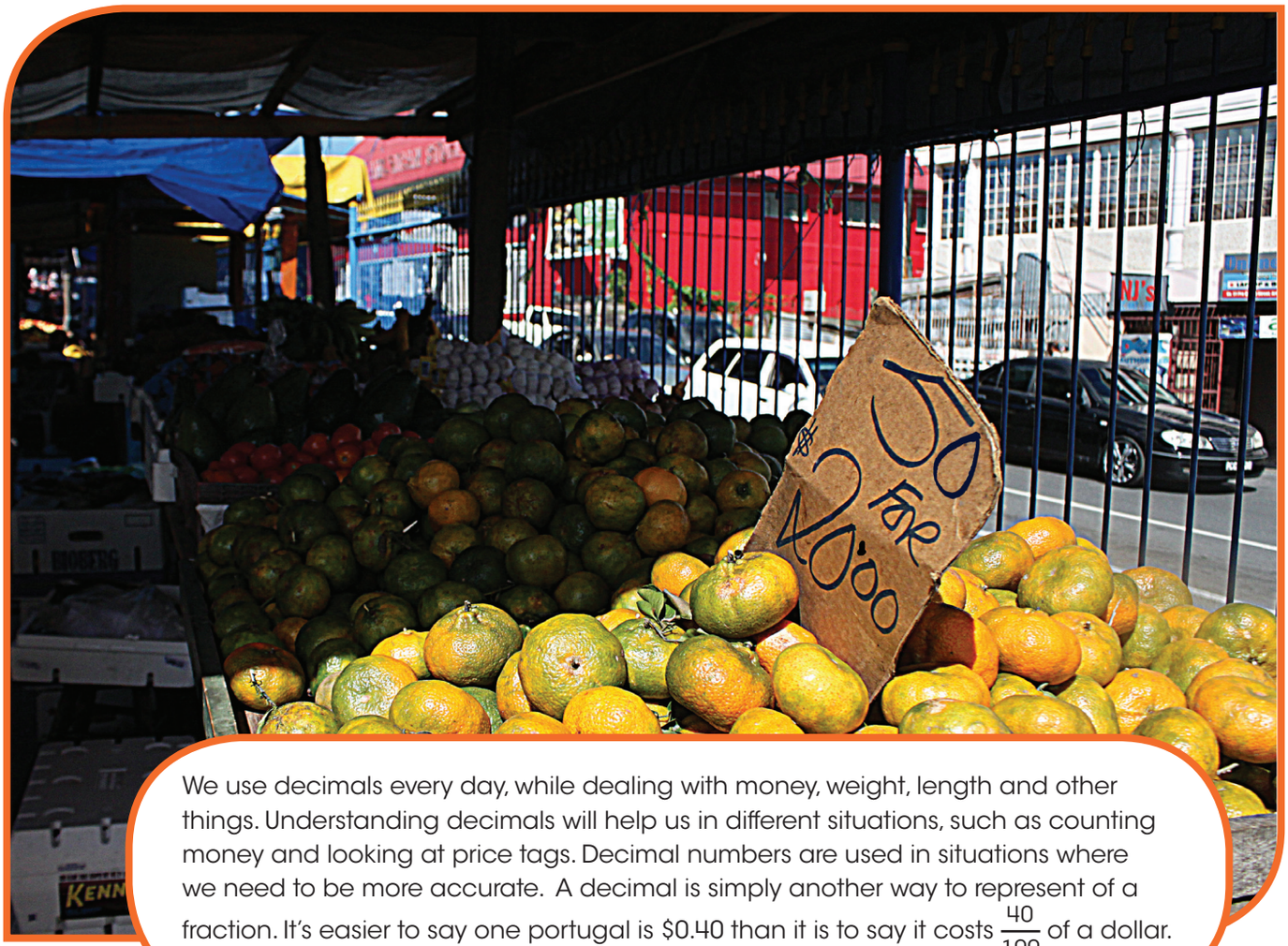
Understanding Decimals

Vocabulary:

decimal
decimal point •
tenths
hundredths

Chapter Outcomes:

- Demonstrate an understanding of decimals up to hundredths.
- Develop an understanding of the comparison of decimals.
- Develop an understanding of rounding to whole numbers and tenths.

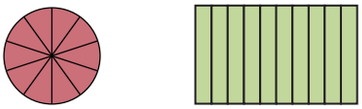


We use decimals every day, while dealing with money, weight, length and other things. Understanding decimals will help us in different situations, such as counting money and looking at price tags. Decimal numbers are used in situations where we need to be more accurate. A decimal is simply another way to represent of a fraction. It's easier to say one portugal is $0.40 than it is to say it costs $\frac{40}{100}$ of a dollar.

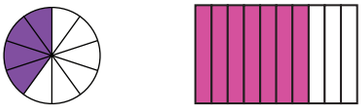
Getting Ready for Chapter 11

Compare. Write >, < or =.

1. 1 808 ◯ 1 880
2. 21 367 ◯ 21 376
3. Name the equal parts of each whole.



4. What fraction of each whole is shaded?



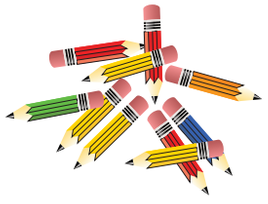
5. Write 120 046 in expanded notation form.
6. Show the number 2 301 in a place value chart.
7. One thousand is equal to ____ hundreds.

Fractions and Decimals - Tenths

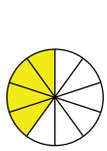
Teaching Point 1:

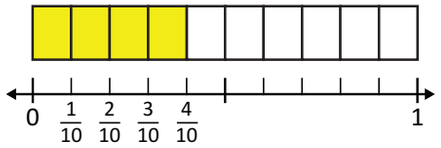
How are fractions and decimals related?

Maya has ten pencils. Four of the pencils are yellow. What fraction of the pencils are yellow?



$\frac{4}{10}$ of the pencils are yellow.





Four parts out of 10 is $\frac{4}{10}$ or four tenths.

Write $\frac{4}{10}$ as 0.4 in **decimal form**.

Tenths can be written as a fraction or a decimal.

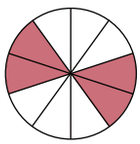
0.4
↑
decimal point
Read 0.4 as four tenths. Its value is 4 tenths.

A **decimal point** (.) is a dot that is used to separate ones from tenths in a number.

A decimal is a number with a decimal point, and digits to the **right** of the decimal point.

Activity 1:

Write the fraction of the shaded and un-shaded parts of each in words and symbols.

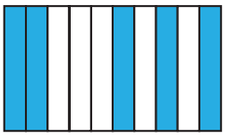
1. 

shaded part: four tenths, $\frac{4}{10}$ or 0.4
un-shaded part: six tenths, $\frac{6}{10}$ or 0.6

2. 

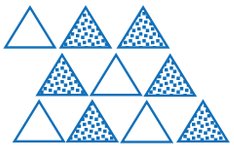
shaded part:
un-shaded part:

3.



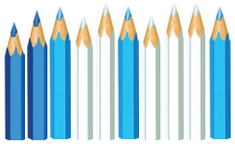
shaded part:
un-shaded part:

4.



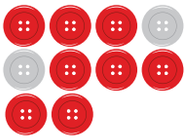
shaded part:
un-shaded part:

5.



shaded part:
un-shaded part:

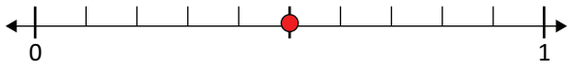
6.



shaded part:
un-shaded part:

Write the decimal that names each point on the number lines.

7.



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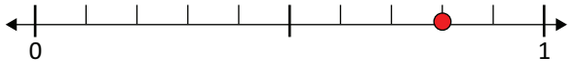

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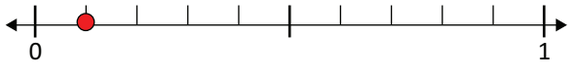

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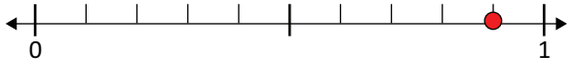
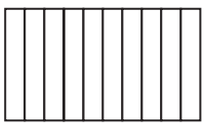


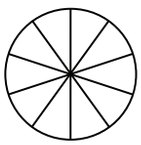
Represent each decimal on the model.

11.



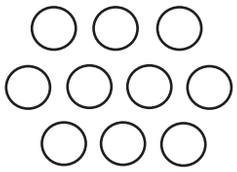
0.7

12.



0.5

13.

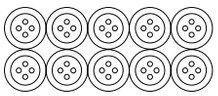


0.6

14.

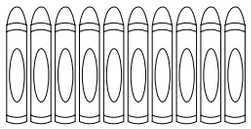
0.1

15.



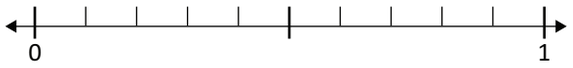
0.8

16.

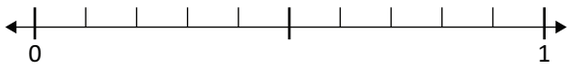


0.2

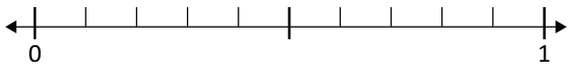
17. 0.4



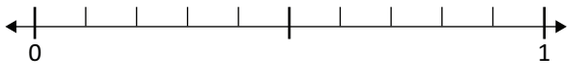
18. 0.7



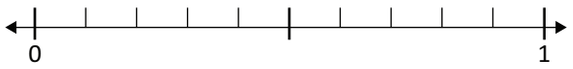
19. 0.5



20. 0.9



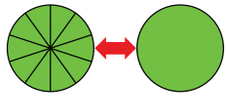
21. 0.8



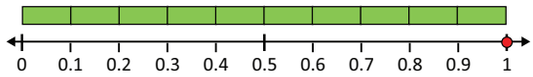
Teaching Point 2:

How can you relate fractions and decimals?

Equivalent tenths and ones



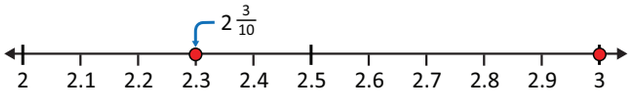
$\frac{10}{10}$ = 1 whole



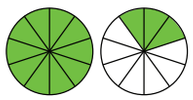
Mixed numbers as decimals

$1 + 1 + \frac{3}{10} = 2\frac{3}{10}$

$2\frac{3}{10}$ = 2 ones and 3 tenths = 2.3



Improper fractions as decimals



$\frac{10}{10} + \frac{3}{10} = \frac{13}{10}$

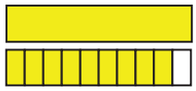
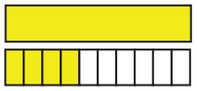
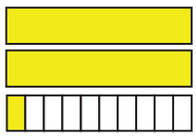
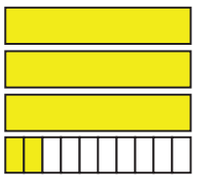
$\frac{13}{10}$ = 13 tenths

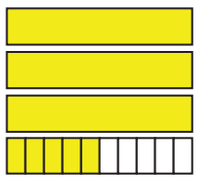
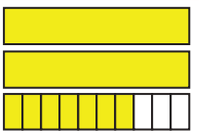
$\frac{13}{10}$ = 1 one and 3 tenths = 1.3

Decimals are another way of writing fractions and mixed numbers.

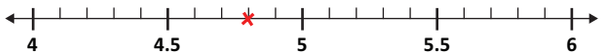
Activity 2:

Write the decimals that the shaded parts represent.

1. 	2. 
3. 	4. 

5. 	6. 

Write the decimal that each point (✗) represents.

7. 

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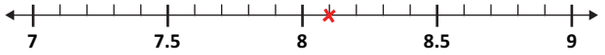
9. 

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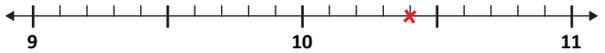
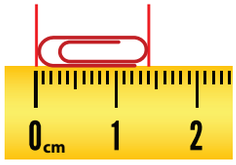
11. 

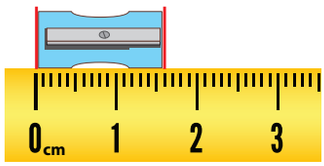
12. 

Express each of these as decimals.

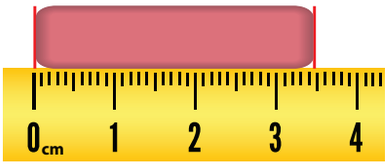
13. 14 tenths =	14. 3 ones 5 tenths =
15. 25 tenths =	16. $2\frac{6}{10}$ =
17. $3\frac{8}{10}$ =	18. $\frac{26}{10}$ =
19. $\frac{11}{10}$ =	20. 9 ones 1 tenth =

Express the length of each object as a mixed number and as a decimal.

21. 

22. 

23.



Express the amount of liquid as a mixed number and as a decimal.

24.

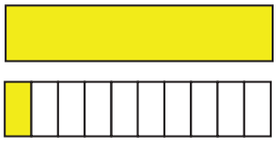
___L

25.

___L

26. Mark rode his bicycle $1\frac{6}{10}$ kilometre. What decimal describes how far he rode his bicycle?

27. Use the model below to explain how 1 is more than 0.1.



Decimal Place Value - Tenths

Teaching Point 2:

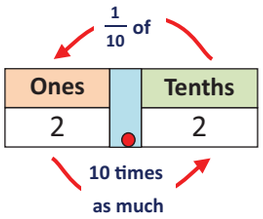
How can you find the value of a digit using its place-value position?

The weight of a 1-cent coin is about 2.2 grams.

Word form

two and two tenths

Place Value Chart



Expanded form

2 + 0.2

Expanded notation form

$(2 \times 1) + \left(2 \times \frac{1}{10}\right)$

Activity 1:

Write each number in a place value chart and write it in words.

1. 4.9	**2.** 14.1	**3.** 20.5
4. 11.2	**5.** 17.8	**6.** 127.4
7. 6 780.3	**8.** 308.6	**9.** 93.7
10. 12 678.2	**11.** 75.6	**12.** 1 000.1
13. 3.7	**14.** 45.4	**15.** 368.5

Write the missing numbers.

1. 0.7 = ☐ tenths

2. 4.8 = ☐ ones + ☐ tenths

3. 19.6 = ☐ tens + ☐ ones + ☐ tenths

4. 30.1 = ☐ tens + ☐ ones + ☐ tenths

5. 129.3 = ☐ hundred + ☐ tens + ☐ ones + ☐ tenths

6. $2.8 = 2 + \frac{\square}{10}$

7. $34.7 = \square + 4 + \frac{\square}{\square}$

8. $506.4 = 500 + \square + \square + \frac{4}{10}$

Write each decimal fraction in expanded notation form.

9. 7.1	10. 5.5	11. 32.3
12. 16.2	13. 210.8	14. 109.4
15. 600.3	16. 269.7	17. 42.9

Convert each expanded notation to its decimal fraction.

18. $(2 \times 1) + \left(2 \times \frac{1}{10}\right)$

19. $(3 \times 10) + (4 \times 1) + \left(5 \times \frac{1}{10}\right)$

20. $(6 \times 10) + (0 \times 1) + \left(1 \times \frac{1}{10}\right)$

21. $(1 \times 100) + (6 \times 10) + (1 \times 1) + \left(8 \times \frac{1}{10}\right)$

22. $(7 \times 100) + (0 \times 10) + (0 \times 1) + \left(9 \times \frac{1}{10}\right)$

23. $\left(7 \times \frac{1}{10}\right) + (2 \times 10) + (4 \times 1)$

Activity 2:

Write the value of each underlined digit in each decimal fraction.

1. 3.9	2. 25.6	3. 39.7
4. 102.8	5. 90.2	6. 421.3
7. 2 350.5	8. 830.1	9. 45.4

What is the place value of the 2 in each decimal fraction.

10. 12.6	11. 2.7	12. 7.2
13. 351.2	14. 20.1	15. 207.5
16. 620.5	17. 89.2	18. 2 491.3

19. Write a decimal fraction that has 3 in the tenths place and 6 in the ones place.

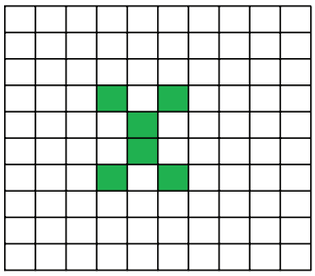
20. In July 2016, Trinidad and Tobago received 25.4 cm of rain. What is the value of the digit 4 in 25.4?

Fractions and Decimals - Hundredths

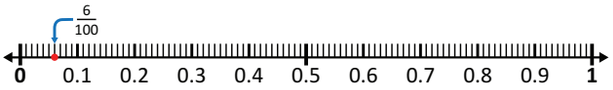
Teaching Point 1:

How are fractions and decimals related?

There are 100 tiles on the floor of a room. 6 of those tiles are green. What fraction of the tiles are green?



$\frac{6}{100}$ of the tiles are green.



Both the number line and the square have 100 equal parts.

Each part is $\frac{1}{100}$ or one hundredth.

Six parts out of 100 is $\frac{6}{100}$ or six hundredths.

Hundredths can be written as a fraction or a decimal.

Write $\frac{6}{100}$ as 0.06 in **decimal form**.

Read 0.06 as six hundredths.

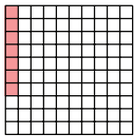
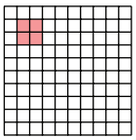
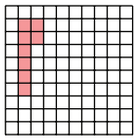
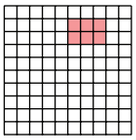
Its value is 6 hundredths.

Activity 1:

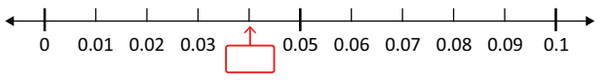
Express each of these as a decimal fraction.

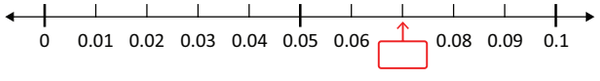
1. $\frac{4}{100}$ metre =	2. $\frac{6}{100}$ metre =
3. $\frac{7}{100}$ =	4. $\frac{9}{100}$ =
5. 9 hundredths =	6. 3 hundredths =

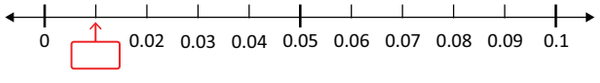
Write the decimal fraction that each shaded part represents.

7. 	8. 
9. 	10. 

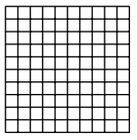
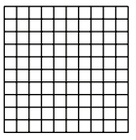
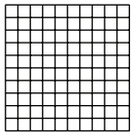
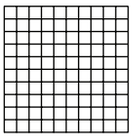
Write the decimal fraction for each point on the number line.

11. 

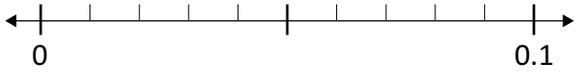
12. 

13. 

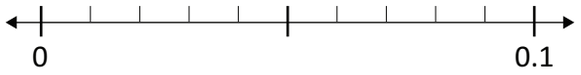
Represent each decimal on the model.

14.  0.06	15.  0.05
16.  0.01	17.  0.04

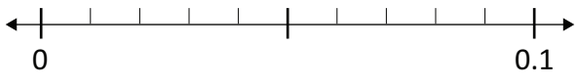
18. 0.09



19. 0.02



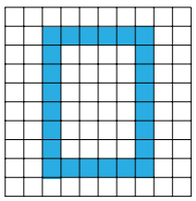
20. 0.08



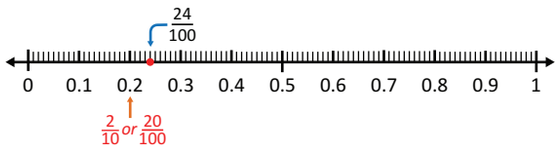
Teaching Point 3:

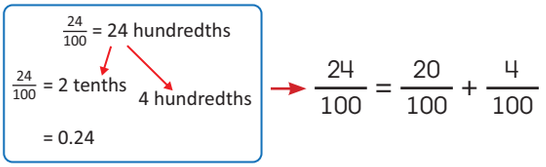
How can you relate fractions and decimals?

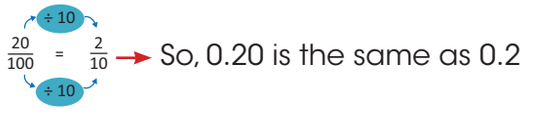
Kevin has 100 tiles. He tiles the room with the tiles. What fraction of the tiles are blue?



$\frac{24}{100}$ of the tiles are blue.





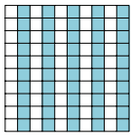
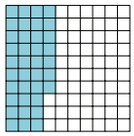
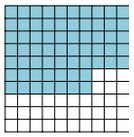
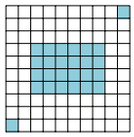
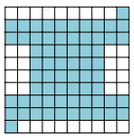
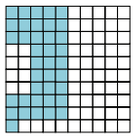


2 tenths + 4 hundredths = 0.24

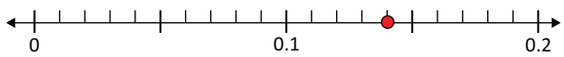
0.24 is twenty-four hundredths

Activity 1:

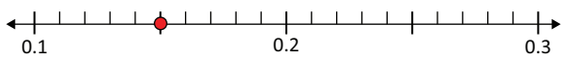
Write the decimal of each shaded part.

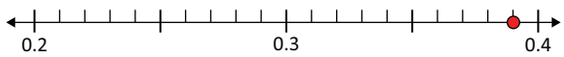
1. 	**2.** 
3. 	**4.** 
5. 	**6.** 

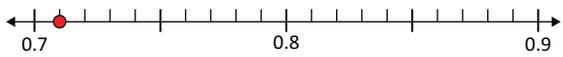
Write the decimal fraction for the point on each number line below.

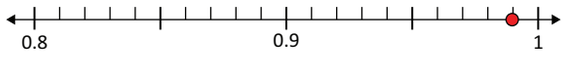
7. 

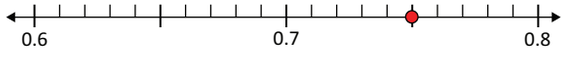
8. 

9. 

10. 

11. 

12. 

13. 

Express each as a decimal fraction.

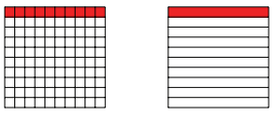
14. $\frac{16}{100}$	**15.** $\frac{32}{100}$	**16.** $\frac{25}{100}$
17. 11 hundredths =		

18. 30 hundredths =		
19. 5 tenths 8 hundredths =		
20. $\frac{16}{100}$	**21.** $\frac{32}{100}$	**22.** $\frac{40}{100}$
23. $\frac{59}{100}$	**24.** $\frac{25}{100}$	**25.** $\frac{98}{100}$

Teaching Point 3:

How can you relate fractions and decimals?

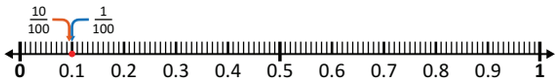
Equivalent tenths and hundredths



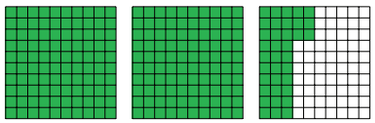
$\frac{10}{100} = \frac{1}{10}$

10 hundredths = 1 tenth

$\frac{10}{100} = \frac{1}{10}$ or 0.1

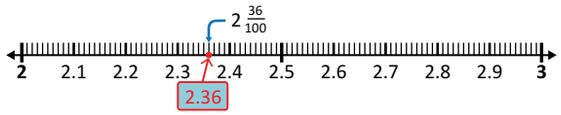


Mixed numbers as decimals

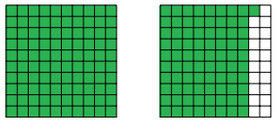


$1 + 1 + \frac{36}{100} = 2\frac{36}{100}$

$2\frac{36}{100}$ = 2 ones and 36 hundredths or 2.36



Improper fractions as decimals



$\frac{100}{100} + \frac{81}{100} = \frac{181}{100}$

$\frac{181}{100}$ = 181 hundredths

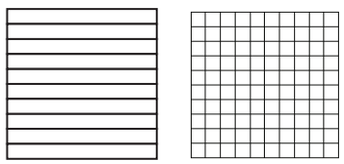
$\frac{181}{100}$ = 1 one and 81 hundredths

1 one and 81 hundredths = 1.81

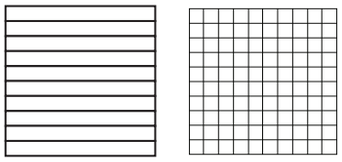
Activity 2:

Write each fraction as an equivalent fraction. Shade the models to show that the fractions are equivalent. Write each fraction as a decimal fraction.

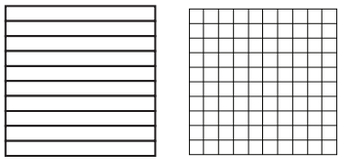
1. $\frac{4}{10} = \frac{\square}{100}$



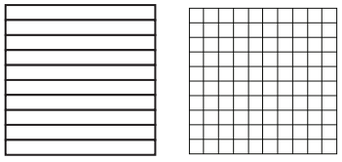
2. $\frac{2}{10} = \frac{\square}{100}$



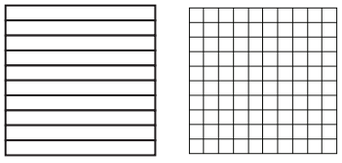
3. $\frac{9}{10} = \frac{\square}{100}$



4. $\frac{3}{10} = \frac{\square}{100}$



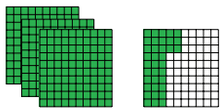
5. $\frac{6}{10} = \frac{\square}{100}$

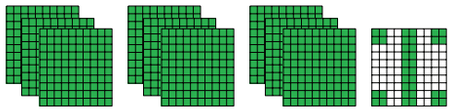


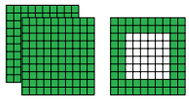
6. Three children are walking from school to the playground. Keisha walked 8 hundredths of the distance, Lee walked 2 hundredths of the distance and Alex walked 9 hundredths of the distance. Write the decimal fractions to show the distance each child walked.

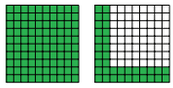
Activity 3:

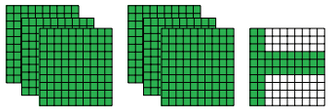
Write the decimal fraction that the shaded parts represent.

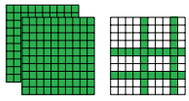
1. 

2. 

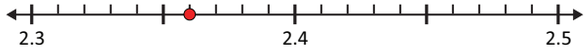
3. 

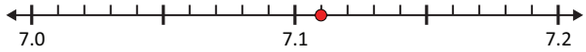
4. 

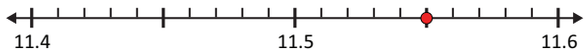
5. 

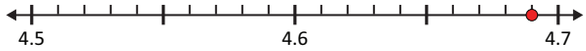
6. 

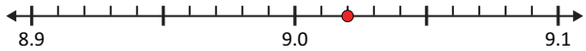
Write the decimal fraction for each point (●) on each number line.

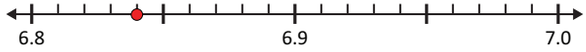
7. 

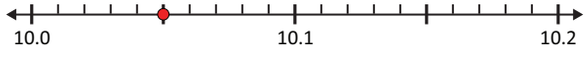
8. 

9. 

10. 

11. 

12. 

13. 

Express each mixed number as a decimal fraction.

14. $3\frac{13}{100}$	**15.** $1\frac{4}{100}$	**16.** $9\frac{7}{100}$
17. $7\frac{54}{100}$	**18.** $10\frac{3}{100}$	**19.** $26\frac{59}{100}$
20. $2\frac{5}{100}$	**21.** $40\frac{1}{100}$	**22.** $8\frac{10}{100}$

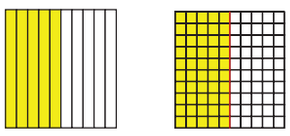
Express each as a decimal fraction.

23. $\frac{126}{100}$ =	**24.** 345 hundredths =
25. $\frac{234}{100}$ km = ___km	**26.** $\frac{103}{100}$ =

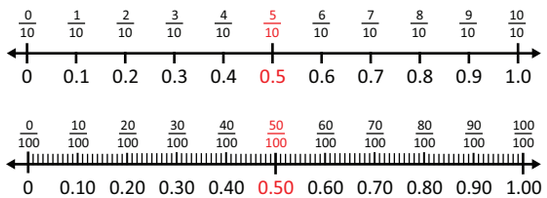
Common Fractions and Decimal Equivalents

Teaching Point 1:

How can you express common fractions as decimals?



$0.5 = \frac{5}{10} = \frac{1}{2}$ or $0.50 = \frac{50}{100} = \frac{1}{2}$



What fraction and decimal describes the shaded part?

$\frac{1}{5} = \frac{1 \times 2}{5 \times 2} = \frac{2}{10}$ ← Change fifths to tenths.

$\frac{2}{10} = 0.2$

So, $\frac{1}{5}$ and 0.2 describes the shaded part.

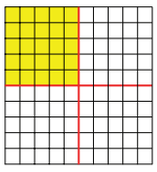
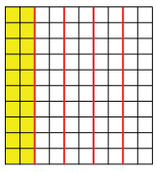
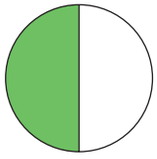
To find a decimal that is equivalent to a fraction, write the fraction with a denominator of 10 or 100.

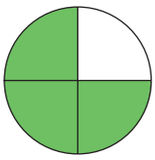
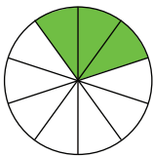
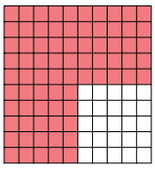
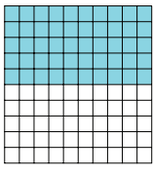
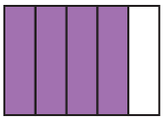
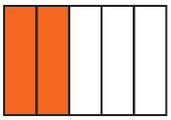
Some other common fractions and decimal equivalents are:

$\frac{1}{2} = 0.5$, $\frac{1}{4} = 0.25$, $\frac{2}{4} = 0.50$, $\frac{3}{4} = 0.75$

Activity 4:

Write a common fraction and decimal to describe the shaded part of each model.

1. 	**2.** 
3. 	**4.** 

5. 	6. 
7. 	8. 
9. 	10. 

Write each fraction as a decimal.

11. $\frac{3}{5}$	12. $\frac{6}{10}$	13. $\frac{1}{5}$
14. $\frac{50}{100}$	15. $\frac{7}{10}$	16. $\frac{2}{4}$
17. $\frac{2}{25}$	18. $\frac{5}{20}$	19. $\frac{4}{50}$

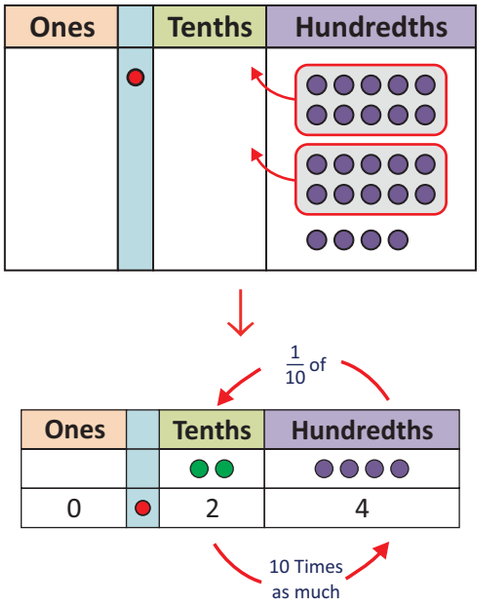
Decimal Place Value - Hundredths

Teaching Point 1:

How can you represent decimals in different ways?

How many ways can you represent 0.24?

Regroup hundredths as **tenths** and **hundredths** in a **Place Value Chart**.



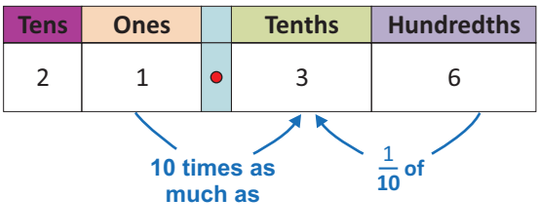
Word Form: twenty four hundredths

Expanded Form: 0.2 + 0.04

Expanded Notation Form:

$$\left(2 \times \frac{1}{10}\right) + \left(4 \times \frac{1}{100}\right)$$

What are some ways to represent 21.36?



Word Form:
twenty-one and thirty-six hundredths

Expanded Form: 20 + 1 + 0.3 + 0.06

Expanded Notation Form:

$$(2 \times 10) + (1 \times 1) + \left(3 \times \frac{1}{10}\right) + \left(6 \times \frac{1}{100}\right)$$

Activity 1:

Express each of the following as a decimal fraction.

1.

Ones		Tenths	Hundredths
		○○○○ ○○	○○○

2.

Ones		Tenths	Hundredths
○○○○ ○			○○○○○ ○○○○

3.

Ones		Tenths	Hundredths
		○	○

4.

Ones		Tenths	Hundredths
○○○○ ○○		○○○ ○○○	○○○○○

5.

Tens	Ones		Tenths	Hundredths
○○○○ ○	○○○○ ○		○○○	○○○○

6.

Tens	Ones		Tenths	Hundredths
○○				○○○○○ ○○○○

7.

Hundreds	Tens	Ones		Tenths	Hundredths
5	0	0		0	7

Represent each decimal on a place value chart.

8. 0.47	**9.** 8.03	**10.** 10.90
11. 72.81	**12.** 20.06	**13.** 103.51
14. 135.01	**15.** 300.09	**16.** 2 305.04

Use a place value chart to complete the table below.

Decimal	10 times as much as	$\frac{1}{10}$ of
17. 0.3	3	0.03
18. 0.4		
19. 0.1		
20. 5.0		

Activity 2:

Write each decimal fraction in words.

1. 0.12	**2.** 0.06	**3.** 0.66
4. 0.41	**5.** 0.15	**6.** 0.70
7. 6.08	**8.** 7.12	**9.** 9.99
10. 12.67	**11.** 203.60	**12.** 310.09
13. 4 012.02	**14.** 50.03	**15.** 775.25

Write the decimals for the words below.

16. sixty-seven hundredths.

17. twelve hundredths.

18. fifty-five hundredths.

19. ninety-two hundredths.

20. six hundredths.

21. one hundredths.

22. seven and twelve hundredths.

23. sixty and nine hundredths.

24. two hundred and fifty and eighty-one hundredths.

25. one thousand and five and three hundredths.

26. Seven hundred and forty-seven and fifty hundredths.

Activity 3:

Write the missing numbers to complete each number sentence.

1. 0.49 = ☐ tenths + ☐ hundredths

2. $0.58 = \frac{\square}{10} + \frac{8}{100}$

3. $0.16 = \frac{1}{\square} + \frac{6}{\square}$

4. $\frac{27}{100} = 0.2 + \square$

5. $\frac{34}{100} = \square + 0.04$

6. 0.25 = ☐ + 0.05

7. 0.10 = 0.1 + ☐

8. 2.51 = ☐ ones + ☐ tenths + ☐ hundredths

9. 41.08 = ☐ + 1 + ☐ + ☐

10. $10.27 = 10 + \square + \frac{2}{10} + \square$

11. 305.02 = ☐ + 5 + ☐

12. 8.91 = ☐ ones + ☐ hundredths

13. 430.71 = ☐ tens + ☐ hundredths

14. $510.01 = \square + \square + \frac{1}{100}$

Express each expanded form as a decimal fraction.

15. 0.2 + 0.06 =	16. 0.1 + 0.01 =
17. 0.6 + 0.04 =	18. 0.9 + 0.03 =
19. 0.8 + 0.02 =	20. 0.1 + 0.05 =
21. 0.4 + 0.06 =	22. 0.7 + 0.07 =
23. 20 + 0.08 =	24. 8 + 0.6 =
25. 20 + 0.03 =	26. 700 + 1 + 0.02 =
27. 90 + 2 + 0.9 + 0.01 =	
28. 3 000 + 2 + 0.4 + 0.08 =	
29. 1 000 + 400 + 0.7 + 0.09 =	

Activity 4:

Write each decimal fraction in expanded notation form.

1. 0.33	2. 0.73	3. 0.56
4. 0.08	5. 0.74	6. 0.39
7. 0.27	8. 0.19	9. 0.98
10. 7.09	11. 20.51	12. 809.4
13. 21.97	14. 600.02	15. 231.67
16. 1 097.11	17. 291.84	18. 0.06
19. 301.04	20. 7.91	21. 400.02

Write the decimal for each expanded notation form.

22. $\left(1 \times \frac{1}{10}\right) + \left(4 \times \frac{1}{100}\right) =$

23. $\left(3 \times \frac{1}{10}\right) + \left(6 \times \frac{1}{100}\right) =$

24. $\left(0 \times \frac{1}{10}\right) + \left(9 \times \frac{1}{100}\right) =$

25. $\left(0 \times \frac{1}{10}\right) + \left(8 \times \frac{1}{100}\right) =$

26. $\left(6 \times \frac{1}{10}\right) + \left(0 \times \frac{1}{100}\right) =$

27. $\left(4 \times \frac{1}{10}\right) + \left(5 \times \frac{1}{100}\right) =$

28. $\left(9 \times \frac{1}{10}\right) + \left(2 \times \frac{1}{100}\right) =$

29. $\left(1 \times 100\right) + \left(5 \times \frac{1}{100}\right) =$

30. $(4 \times 1\,000) + (9 \times 1) + \left(8 \times \frac{1}{10}\right) =$

31. $(7 \times 10) + \left(3 \times \frac{1}{10}\right) + \left(5 \times \frac{1}{100}\right) =$

Activity 5:

What is the VALUE of the underlined digit in each decimal fraction.

1. 0.0<u>7</u>	**2.** 0.<u>2</u>9	**3.** 0.<u>5</u>0
4. 12.0<u>5</u>	**5.** <u>1</u>.92	**6.** <u>3</u>9.11
7. <u>6</u>0.02	**8.** 8.2<u>4</u>	**9.** 921.3<u>5</u>
10. 1 7<u>8</u>0.05	**11.** 2 067.<u>9</u>3	**12.** 101.<u>1</u>6

What is the PLACE VALUE of the underlined digit in each decimal fraction

13. 0.6<u>7</u>	**14.** 0.0<u>1</u>	**15.** 0.<u>1</u>
16. 40.0<u>1</u>	**17.** <u>8</u>0.21	**18.** 431.<u>7</u>
19. 10<u>3</u>.05	**20.** 7.6<u>2</u>	**21.** 4<u>1</u>0.1
22. 37.<u>6</u>0	**23.** 3 090.<u>2</u>	**24.** 910.6<u>8</u>

Activity 6:

Solve the problems below.

1. Usain Bolt won the 2016 Olympic 100m race in 9.81 seconds. What is the value of the digit 8 in 9.81?

2. There are one hundred sticks of chalk in a box. Fifteen sticks of chalk are broken.

   a) What decimal fraction shows the fraction of the chalk that is broken?

   b) What decimal fraction shows the fraction of the chalk that is not broken?

3. Alisha earned eighty-nine out of 100 marks in the Mathematics test. What decimal fraction shows the part of the marks she made?

4. A cafeteria opened a bottle of 100 sweets and sold 48 of them. What decimal fraction shows the part of the sweets that was left?

5. On a video game Isaiah scored 92 out of a possible 100 points. What part of the possible points did he score?

6. The distance between Arun's home and the school is seventy-five hundredths of a kilometre. Write this distance as a decimal fraction.

Use the table below to answer questions 7 and 8.

Distances Mark Walked	
Days	Distances (in Kilometres)
Monday	0.52
Wednesday	0.48
Friday	0.5

7. On which day did Mark walk five tenths of a kilometre?

8. Write in words how far Mark walked on Wednesday?

9. There are 10 questions on a test. Mathias answered 6 of them correctly. Write a decimal fraction to show what part of the test he answered correctly.

10. How many times is 0.2 more than 0.02?

11. In the decimal 2.77, how many times is the value of the 7 in the hundredths place contained in the value of the 7 in the tenths place?

12. Write a number with a 4 in the tens place and a 3 in the hundredths place.

13. Write a decimal that is ten times as much as 0.04.

14. Write a decimal that is $\frac{1}{10}$ of 0.9.

15. Explain how one whole, one tenth, and one hundredth are related.

Relate Decimals and Money

Teaching Point 2:

How are decimals and fractions related to money?

How can you pay for the pack of orange juice?

Remember

1 dollar = 100 cents

You can use the bill and coins below.

5 dollars	25¢	10¢	5¢	1¢
$5 or $5.00	$0.25	$0.10	$0.05	$0.01

$5.36

Ones	Tenths	Hundredths
○○○○○	●	○○○	○○○○○ ○

Think: $5.36 = 5 ones and 36 hundredths

Think: $5.36 → 500¢ + 36¢ = 536¢

is $\frac{25}{100}$ or $\frac{1}{4}$ of a dollar = $0.25

is $\frac{10}{100}$ or $\frac{1}{10}$ of a dollar = $0.10

is $\frac{5}{100}$ or $\frac{1}{20}$ of a dollar = $0.05

is $\frac{1}{100}$ of a dollar = $0.01

Activity 1:

Write each total money amount as a decimal fraction.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Express each amount using a dollar sign and decimal point.

11. 4 dollars and 5 cents.

12. 7 dollars and 40 cents.

13. 48 dollars and 9 cents.

14. 350 dollars and 12 cents.

15. 45 dollars and 6 cents.

16. 103 dollars and 10 cents.

17. Seventeen dollars and twelve cents.

18. 125 cents.

19. 43¢	20. 6¢	21. 20¢
22. 125¢	23. 760¢	24. 1 034¢
25. 2 301¢	26. 507¢	27. 20 158¢

Activity 2:

Solve the problems.

1. Kim spent $\frac{50}{100}$ of a dollar on a snack. Write as a money amount the amount she has left.

The table shows the coins that 3 children have in their Piggy Banks.

Coins in Piggy Banks				
Name	1 CENT	10 CENTS	5 CENTS	25 CENTS
Alex	6	2	3	2
Mark	1	0	3	3
Keva	9	3	1	1

Use the table on the left for questions 2 – 3.

2. Write the total amount of money that Keva has as a decimal in terms of dollars.

3. Mark spent $\frac{40}{100}$ of a dollar on a snack. Write the amount of money he has left as a decimal in terms of dollars.

4. David has $0.68 left after buying lunch at school. Write the money amount as a fraction in terms of dollars?

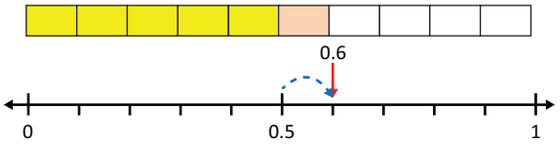
5. Che has $\frac{50}{100}$ of a dollar. He has at least two different types of coins in his pocket. Draw two possible sets of coins that Che could have.

Compare and Order Decimals

Teaching Point 1:

How can you compare and order decimal fractions?

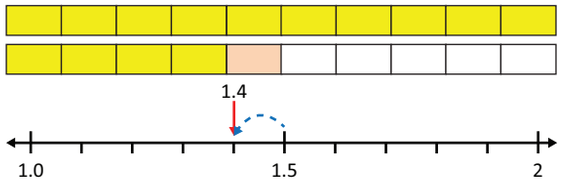
What is **0.1** more than **0.5**?



Each part is 0.1 → 0.5 + 0.1 = 0.6

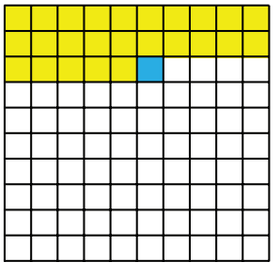
0.6 is 0.1 more than 0.5.

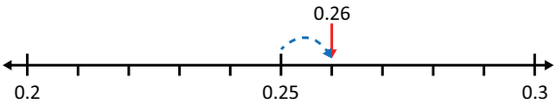
What is **0.1** less than **1.5**?



0.5 – 0.1 = 0.4 → 1.4 is 0.1 less than 1.5

What is **0.01** more than **0.25**?

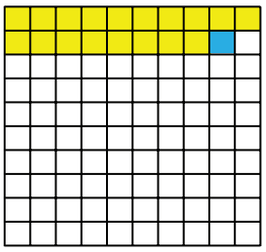


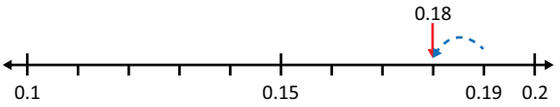


Each part is 0.01 → 0.25 + 0.01 = 0.26

0.01 more than 0.25 is 0.26.

What is **0.01** less than **0.19**?





0.19 – 0.01 = 0.18 → 0.18 is 0.01 less than 0.19.

Activity 1:

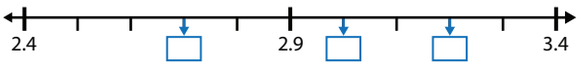
Complete.

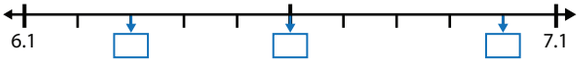
1. What number is 0.1 more than 2.3?
2. 0.2 more than 0.6 is ☐.
3. 0.04 less than 1.38 is ☐.
4. What number is 0.01 less than 5.64?
5. 0.03 more than 3.09 is ☐.

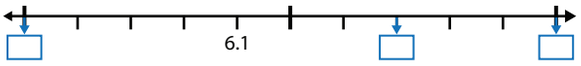
Insert the next 3 decimal numbers in the sequence.

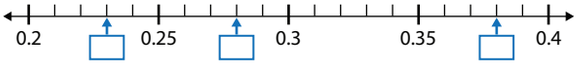
6. 0.1, 0.2, 0.3, _____, _____, _____
7. 0.4, 0.6, 0.8, _____, _____, _____
8. 7.8, 8.0, 8.2, _____, _____, _____
9. 2.09, 2.11, 2.13, _____, _____, _____
10. 4.45, 4.50, 4.55, _____, _____, _____
11. 1.24, 1.30, 1.36, _____, _____, _____

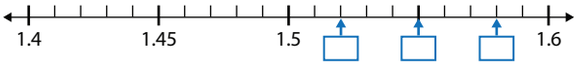
Write the missing decimals on each number line.

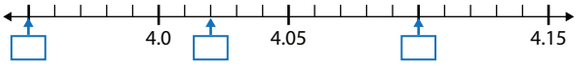
12. 

13. 

14. 

15. 

16. 

17. 

Teaching Point 2:

How can you compare and order decimal fractions?

A paperclip is about 1.06g, a push pin is about 1.2g and a toothpick is about 0.84g. Which object has the greatest mass?

Use a place value chart.

	Ones		Tenths	Hundredths
1.06 =	●	●		●●●●● ●
1.2 =	●		●●	
0.84 =			●●●●● ●●●	●●●●

First, compare **ones** because it's the digit with the greatest value. There is 0 ones in 0.84 and 1 one in both 1.06 and 1.2.

So, 0.84 is the smallest number.

Next, compare the **tenths**.

2 **tenths** is greater than 0 **tenths**.

1.2 > 1.06.

The masses written in order from **least to greatest** are: 0.84g, 1.06g, 1.2g.

The masses written in order from **greatest to least** are: 1.2g, 1.06g, 0.84g.

So, the push pin has the **greatest** mass.

Activity 2:

Compare. Use < or >.

1. 0.54 ◯ 0.8	**2.** 1.54 ◯ 1.45
3. 1.0 ◯ 0.1	**4.** 0.01 ◯ 0.1
5. 1.5 ◯ 0.51	**6.** 0.3 ◯ 0.13
7. 2.5 ◯ 0.52	**8.** 3.5 ◯ 5.3
9. 2.52 ◯ 2.25	**10.** 0.75 ◯ 1.01

Order these decimal fractions from least to greatest.

11. 0.2, 0.8, 0.5, 0.3

12. 1.4, 1.8, 1.2, 1.7

13. 4.2, 4.5, 4.9, 4.3

14. 7.1, 7.7, 7.6, 7.3

15. 0.8, 1.7, 0.31, 0.71

16. 1.04, 0.04, 0.14, 1.4

17. 0.20, 2.02, 2.2, 0.22

Order these decimal fractions from greatest to least.

18. 1.5, 5.1, 0.15, 0.51

19. 0.83, 8.3, 0.8, 0.38

20. 0.25, 0.2, 0.24, 0.21

21. 0.49, 0.4, 0.53, 0.35

22. 2.8, 2.08, 2.28, 2.88

23. 4.32, 4.23, 3.24, 3.43

24. Order the amounts of money below, from least to greatest.
$4.88, $5.19, $4.83, $5.02

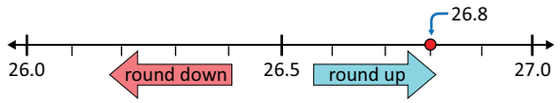
Round Decimals

Teaching Point 2:

How can you round decimals?

Round to the nearest whole number.

A bunch of plantains has a mass of 26.8 kilograms. Round 26.8 to the nearest kilogram.

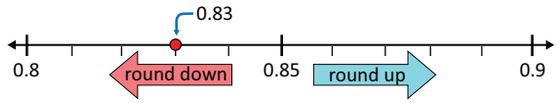


26.5 is halfway between 26 and 27.
To round to the nearest whole number, look at the **tenths** digit.
Since, the tenths digit is **greater than 5, round up**.

So, 26.8kg rounded to the nearest whole number is 27kg.

Round to the nearest tenth.

Danielle's height is 0.83 metres. Round 0.83 metres to the nearest tenth of a metre.



0.83 = 8 tenths 3 hundredths
0.83 is between 8 tenths and 9 tenths
It is nearer to 8 tenths than 9 tenths.
To round to the nearest tenths, look at the **hundredths** digit.
Since, the hundredths digit is **less than 5, round down**.

So, 0.83m rounded to the nearest tenth is 0.8m.

Activity 1:

Round each to the nearest whole number.

1. 2.3	**2.** 5.7	**3.** 1.5
4. 7.18	**5.** 4.64	**6.** 3.39
7. 8.07	**8.** 0.89	**9.** 0.58
10. 10.09	**11.** 20.41	**12.** 809.6

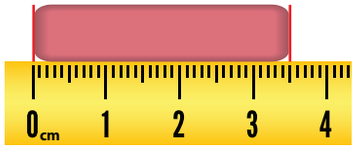
Round each to the nearest tenth.

13. 0.37	**14.** 0.14	**15.** 0.85
16. 1.18	**17.** 3.64	**18.** 7.39
19. 4.13	**20.** 8.35	**21.** 25.94
22. 67.28	**23.** 10.61	**24.** 204.52

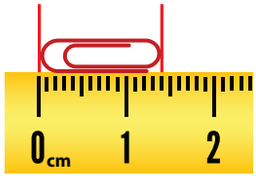
25. What is $35.90 rounded to the nearest dollar?

26. A dinner mint costs 85¢ and a toffee costs 73¢. What is the cost of both sweets rounded to the nearest dollar?

27. What is the length of the eraser rounded to the nearest centimetre?



28. What is the length of the paperclip rounded to the nearest centimetre?



Use the table below to answer questions 29 to 31.

Mr. Johnson's Class

Students	Grade
Alex	92.53
Vanessa	88.27
Alyah	76.81
Kiesha	87.59
Dana	84.53
Rianna	84.49

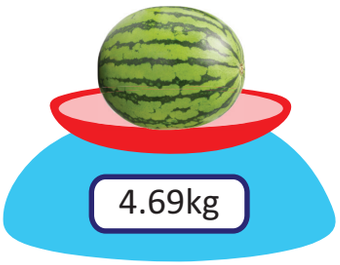
29. Mr. Johnson rounds his students' grades to the nearest whole number. For a student to get an A he or she must achieve 93 or above. Will Alex get an A?

30. To the nearest whole number, which two students earned the same grade?

31. To the nearest whole number, who earned a higher score, Dana or Rianna?

32. Mr. Charles wants to buy a hose that costs $195.25. About how much does the hose cost to the nearest dollar?

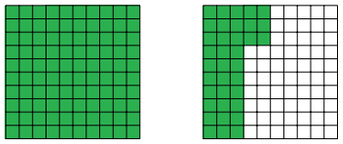
33. What is the mass of the watermelon rounded to the nearest tenth of a kilogram?



Chapter Review

Solve the problems below.

1. What decimal is shown on the model below?



2. Express 120.07 in words.

3. Write the value of the underlined digit in the number 8.9<u>1</u>

4. Which of the following has 9 in the hundredths place?

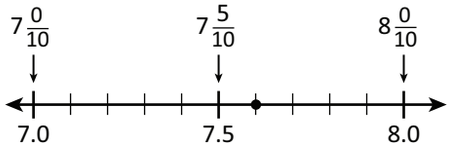
65.91, 28.79, 19.88, 926.7

5. Write each mixed number as a decimal.

a) $4\frac{5}{10}$

b) $16\frac{6}{100}$

6. Look at the number line.



Which decimal represents the point shown on the number line?

7. Express as a decimal:

$(4 \times 1\,000) + (9 \times 1) + \left(8 \times \frac{1}{10}\right) + \left(1 \times \frac{1}{100}\right) =$

8. What is 0.04 more than 2.19?

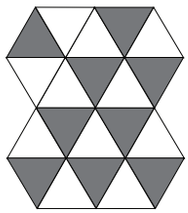
Use the table to answer questions 9 and 10.

Distances Mark Walked	
Days	**Distances (In Kilometres)**
Monday	1.5
Wednesday	5.4
Friday	0.5

9. On which day did Mark walk five tenths of a kilometre?

10. Write in words how far Mark walked on Wednesday?

11. State as a decimal the portion of the diagram that is shaded.



12. Write 3.49 to the nearest tenth.

13. Write 0.75 as a common fraction.

14. Write the following numbers in order of size, starting with the LARGEST.

0.20, 0.12, 0.21

15. On Sports Day, Mike runs 100 metres in 13.89 seconds and Neal runs the same distance in 13.01 seconds. Who is the FASTER runner?

16. Write the following numbers in ASCENDING order (smallest first):

0.25, 0.16, 0.09

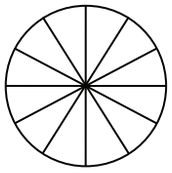
17. Isaiah has 12 coins. One half are 1 cent coins. One third are 5 cent coins. The rest are 25 cent coins. Write the value of Isaiah coins as a decimal in terms of a dollar.

18. Which number below is greater than 7.23 and less than 7.55?

7.59 7.17 7.6 7.3

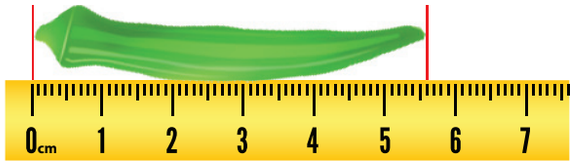
19. Mother gave Alyssa, Allyann, and Aleena the same allowance. Alyssa saved $\frac{2}{5}$ of her allowance. Allyann saved 0.35 of hers. Alyssa saved 0.3 of hers. Who saved the most money?

20. A pizza is cut into 12 equal slices as shown below.



Shade 0.25 of the pizza.

21. The length of an ochro is measured below.



What is its length to the nearest centimetre?

22. A baker uses 2.37 kilograms of flour for muffins. Which amount is closest to 2.37 kilograms?

a) 2.3 kg

b) 2.42 kg

c) 3.32 kg

d) 2.4 kg

23. Sharon has 4 coins on her desk. They have a total value $0.50. Two of the coins are shown in the diagram below.

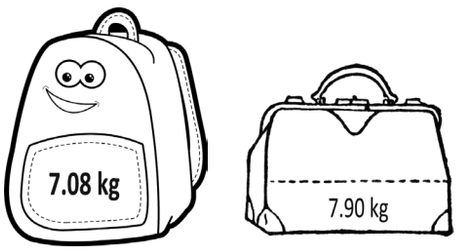
Write the correct value on EACH of the other 2 coins.

24. Mickell has a total of $8.00 in his piggy bank. If he only saves 10¢ coins and 25¢ coins, what possible combination of coins can he have?

25. A fruit vendor has 160 fruits in his stall. Of these 40 of them are apples and the rest are oranges. Express the number of oranges as a DECIMAL fraction.

26. A video lasts 6.44 minutes. About how long does the video last, rounded to the nearest minute?

27. At the airport check-in counter, Alisha checked in the bag with the greater mass, shown below.



What was the mass of the bag that she checked in?

28. Avinash saves 15 coins. All the coins have the same value. He exchanged the coins for an equivalent of $0.75. What is the value of each coin?

29. Maria has a seven10-cent coins and twice as many 25-cent coins. Express the amount of money she has with a dollar sign and a decimal point.

30. Which one has the same value as $1 + \frac{4}{25}$?

a) 1.04

b) 1.16

c) 1.25

d) 1.4

31. Mia has three quarters of dollar. She has two different types of coins. Draw the coins that Mia has.

32. Harry's pencil is 6 cm when rounded to the nearest whole number. What could be the actual length of his pencil?