Unit 10: Decimals (1)

Lesson 1: Tenths (1)

➜ pages 120–122

1. a) This shows $\frac{2}{10}$ or 0·2.
b) This shows $\frac{4}{10}$ or 0·4.
c) The white cubes represent $\frac{7}{10}$ or 0·7.
The grey cubes represent $\frac{3}{10}$ or 0·3.
d) The white beads represent $\frac{4}{10}$ or 0·4.
The grey beads represent $\frac{6}{10}$ or 0·6.

2. a) 3 tenths counters in the tenths (Tth) column.
b) 1 counter in 8 squares of the ten frame (8 counters in total).

3. Missing numbers:
a) 0·1 c) $\frac{7}{10}$
b) $\frac{3}{10}$ d) 0·6

4. 0·2, 0·3, … , 0·5, 0·6, … , 0·9, 1·0

5. Emma is incorrect because $\frac{1}{10}$ as a decimal is 0·1 (the digit 1 written in the tenths column).

6. Alex is thinking of 0·8.

Reflect

Various representations are possible including 6 tenths counters in a place value grid, 6 counters in a ten frame, a fraction strip divided into 10 with 6 sections shaded and as a fraction $\frac{6}{10}$.

Lesson 2: Tenths (2)

➜ pages 123–125

1. a) The number 4·3 has 4 ones and 3 tenths.
b) The number 2·6 has 2 ones and 6 tenths.
c) 4 tens counters and 6 tenths counters in the place value grid; the number 40·6 has 4 tens, 0 ones and 6 tenths.
d) 7 tens counters, 5 tens counters and 1 tenth counters in the place value grid; the number 75·1 has 7 tens, 5 ones and 1 tenth.

2. a) The shaded parts represent $\frac{13}{10}$ or 1·3.
b) 23 tenths shaded (2 wholes and 3 tenths).

3. Statements matched:
This number has 7 tenths ➜ 0·7
The digit in the tenths column is 1 more than the digit in the ones column ➜ 74·5
There are more ones than tenths ➜ 7·6
This number has 15 tenths ➜ 1·5

4. 1·0

5. a) The largest number that could be made is 8·7.
b) The smallest number that could be made is 2·6.
c) 82 < 82·6 < 83 82 < 82·7 < 83

Reflect

Max is incorrect. The one is in the tens column, not the tenths column. The value of each digit is 1 ten, 2 ones and 3 tenths.

Lesson 3: Tenths (3)

➜ pages 126–128

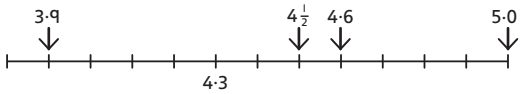
1. a) The worm is 1·2 cm long.
b) The ladybird is 0·8 cm long.

2. a) The container holds 9·5 ml of water.
b) The container holds 15·9 ml of water.

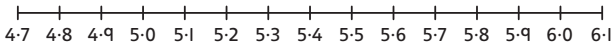
3. a) The grasshopper is 9·6 cm long.
b) The second grasshopper is 8·9 cm long.

4. 3·9, 4, 4·1, 4·2, 4·3, 4·4, …, 4·6, 4·7, 4·8, 4·9, …, 5·1, 5·2

5. Arrows drawn to correct mark on number line:



6. Explanations may vary but should reference the following:
The number '4·10' has been incorrectly written. This number is one tenth (0·1) more than 4·9 and so is 5.



Reflect

It is true. Both numbers have 5 wholes. $\frac{4}{10}$ is 4 tenths, which is written as a decimal as 0·4. So, $5\frac{4}{10} = 5{\cdot}4$

Lesson 4: Dividing by 10 (1)

➜ pages 129–131

1. a) 2 ones = 20 tenths
20 tenths ÷ 10 = 2 tenths
2 ÷ 10 = 0·2
b) 8 ones = 80 tenths
80 tenths ÷ 10 = 8 tenths
So 8 ÷ 10 = 0·8
c) 7 ÷ 10 = 0·7

2. Each section in the bar model represents 0·5;
5 ÷ 10 = 0·5

3. Explanations may vary but should reference the following:
1 ones counter is equal to 10 tenths counters. However, Max is dividing by 10 and so dividing 1 whole (or 10 tenths) by 10 gives 1 tenth, i.e. 1 ÷ 10 = $\frac{1}{10}$ or 0·1.

4. a) 6 ÷ 10 = 0·6 e) 4 ÷ 10 = 0·4
b) 8 ÷ 10 = 0·8 f) 0·5 = 5 ÷ 10
c) 1 ÷ 10 = 0·1 g) 0·3 = 3 ÷ 10
d) 0 ÷ 10 = 0 h) 10 ÷ 10 = 1

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5. I disagree because 5 ÷ 10 = 0·5 or $\frac{5}{10}$. Explanations may vary; for example: using a place value grid and exchange shows that 5 is equal to 50 tenths. Dividing 50 tenths by 10 gives 5 tenths or 0·5.

6. Explanations of patterns may vary; for example, when a single-digit number is divided by 10 the answer will have the digit in the tenths column and 0 in the ones column.
The pattern will continue: 4 ÷ 10 = 0·4; 5 ÷ 10 = 0·5, …

Reflect

Methods will vary but children could include using a place value grid and exchange to convert the ones into tenths and then divide these by 10. Answers should show that when a single-digit number is divided by 10 the answer will have the digit in the tenths column and 0 in the ones column.

Lesson 5: Dividing by 10 (2)

➜ pages 132–134

1. a) 2 tens = 20 ones
20 ones ÷ 10 = 2 ones
4 ones = 40 tenths
40 tenths ÷ 10 = 4 tenths
So, 24 ÷ 10 = 2 ones and 4 tenths = 2·4
b) 4 tens = 40 ones
40 ones ÷ 10 = 4 ones
5 ones = 50 tenths
50 tenths ÷ 10 = 5 tenths
So, 45 ÷ 10 = 4 ones and 5 tenths = 4·5
c) 51 ÷ 10 = 5·1

2. 28 ÷ 10 = 2·8

3. Explanations may vary; for example:
The 4 tens are equal to 40 ones, the 7 ones are equal to 70 tenths. 40 ones ÷ 10 = 4 ones and 70 tenths ÷ 10 = 7 tenths. 4 ones + 7 tenths = 4·7.
The digits stay the same but their positions in the place value grid change as they move one column to the right.

4. False
False
True
True

5. a) 46 ÷ 10 = 4·6
b) 18 ÷ 10 = 1·8
c) 72 ÷ 10 = 7·2
d) 3·9 = 39 ÷ 10
e) 39 ÷ 10 = 3·9
f) 6·5 = 65 ÷ 10

6. Sometimes true; if the 2-digit number has the digits 1 to 9 in the ones column then dividing by 10 will give an answer with a digit in the tenths column. However, if the 2-digit number has a 0 in the ones column, then dividing by 10 will give a 0 in the tenths column, which does not need to be written in. For example: 12 ÷ 10 = 1·2 but 10 ÷ 10 = 1.

7. The missing number could be 78, 77, 76, 75 or 74.
5 ways.

Reflect

Answers will vary; for example:

Same: Both are being divided by 10. The digits stay the same but their positions in the place value grid change; they will move one place to the right. The digit in the ones column will become the digit in the tenths column. Answers to both will have no digit in the tens column.

Different: The answer when dividing the 2-digit number by 10 will have a (non-zero) digit in the ones column, whereas the answer when dividing the 1-digit number by 10 will have zero in the ones column. Dividing the 2-digit number by 10 could make a whole number (if the 2-digit number was a multiple of 10) but dividing the 1-digit number by 10 will always produce a decimal.

Lesson 6: Hundredths (1)

➜ pages 135–137

1. a) 2 squares shaded in the hundredths grid $\frac{2}{100}$ 0·02
b) 14 squares shaded in the hundredths grid $\frac{14}{100}$ 0·14
c) 5 squares shaded in the hundredths grid $\frac{5}{100}$ 0·05

2. $\frac{10}{100}$ or 0·1

3.

Fraction	$\frac{16}{100}$	$\frac{18}{100}$	$\frac{20}{100}$	$\frac{22}{100}$	Any fraction
Decimal	0·16	0·18	0·2 (or 0·20)	0·22	Decimal equivalent

4. a) $\frac{32}{100}$ = 0·32
b) 0·27 = $\frac{27}{100}$
c) 0·39 = $\frac{39}{100}$
d) Nineteen hundredths = 0·19
e) 0·46 = 46 hundredths
f) $\frac{52}{100}$ = 0·52
g) 0·59 = $\frac{59}{100}$
h) $\frac{93}{100}$ = 0·93
i) Ninety hundredths = 0·90 (or 0·9)
j) 0·03 = 3 hundredths

5. Jamie is correct. Explanations may vary; for example:
There are 20 squares shaded, which is $\frac{20}{100}$ or 0·20. This could also be written as 0·2.
2 columns are shaded. Each column is 1 tenth, which as a fraction is $\frac{2}{10}$ and as a decimal is 0·2.

Reflect

Explanations will vary, but children should reference that, when placed in a place value grid, the 7 in 0·07 would be in the hundredths column, meaning it is $\frac{70}{100}$.

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Lesson 7: Hundredths (2)

➜ pages 138–140

1. a) 44 squares shaded in hundredths grid $\frac{44}{100}$ 0·44
b) 14 hundredths counters $\frac{14}{100}$ 0·14
c) 15 squares shaded in hundredths grid $\frac{15}{100}$ 0·15

2. Mo has $\frac{23}{100}$, or 0·23
Isla has $\frac{45}{100}$, or 0·45
Zac has $\frac{32}{100}$, or 0·32

3. 0·5 + 0·5 = 1

4. $\frac{83}{100}$ 0·83

5. I disagree because 5 squares are shaded; this is 5 hundredths or $\frac{5}{100}$, which written as a decimal is 0·05.

6. 0·40 is 4 tenths, which is equivalent to 40 hundredths; Ebo should shade 40 squares on the hundredths grid.

Reflect

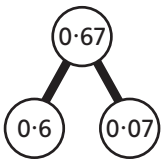
0·31, 0·32, 0·33, 0·34, 0·35, 0·36, 0·37, 0·38, 0·39. There are 9 ways of completing the number sentence using decimals with 2 digits after the decimal point.

Lesson 8: Hundredths (3)

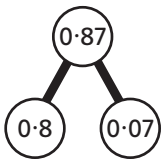
➜ pages 141–143

1. a) The 3 tenth counters represent 0·3.
The 5 hundredth counters represent 0·05.
3 tenths and 5 hundredths make 0·35.
b) The 5 tenth counters represent 0·5.
The 3 hundredth counters represent 0·03.
5 tenths and 3 hundredths make 0·53.
c) The 4 tenth counters represent 0·4.
The 5 hundredth counters represent 0·05.
4 tenths and 5 hundredths make 0·45.

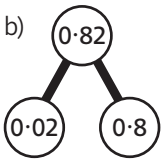
2. a)



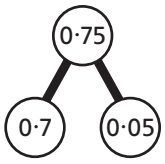
c)



b)



d)



3. Missing numbers:
a) 7 c) 27
b) 17 d) 37

4. a) 0·47 = 0·4 and 0·07
b) 0·3 and 0·05 = 0·35
c) 0·4 and 0·06 = 0·46
d) 0·51 = 0·5 and 0·01
e) 0·09 and 0·3 = 0·39
f) 0·37 = 0·3 and 0·07

5. Disagree. Luis has six 0·01 (hundredths) counters and three 0·1 (tenths) counters. This makes 0·36.

6. 0·1, 0·2, 0·3, 0·31, 0·32, 0·42, 0·43, 0·44, 0·45, 0·46, 0·47, 0·48, 0·58, 0·59, 0·6

Reflect

Explanations may vary; for example:
Since 10 hundredths are equal to 1 tenth, 57 hundredths can be represented by:

5 tenths and 7 hundredths; 4 tenths and 17 hundredths; 3 tenths and 27 hundredths; 2 tenths and 37 hundredths; 1 tenth and 47 hundredths.

Lesson 9: Dividing by 100

➜ pages 144–146

1. a) 5 ones = 500 hundredths
500 hundredths ÷ 100 = 5 hundredths
So, 5 ÷ 100 = 0·05
b) 10 squares split into 10 parts means there are 100 tenths.
100 tenths ÷ 100 = 1 tenth
1 square split into 100 pieces means there are 100 hundredths.
100 hundredths ÷ 100 = 1 hundredth
11 ÷ 100 = 0·11

2. The digits move 2 columns to the right; for example:
15 ÷ 100 = 0·15

3. a) 0·08 c) 0·14 e) 0·55
b) 0·09 d) 0·15 f) 0·65

4. False
False
True
True

5. a) 0·54 d) 0·32 g) 50
b) 63 e) 0·35 h) 0·23
c) 5 f) 36

6. a) The value of the digit 5 in the answer is $\frac{5}{100}$ (5 hundredths).
b) The value of the digit 9 in the answer is $\frac{9}{100}$ (9 hundredths).

Reflect

Explanations may vary; for example:
$\frac{12}{100}$ is the same as 12 ÷ 100, so if you know that $\frac{12}{100}$ = 0·12 then you know 12 ÷ 100 = 0·12.

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Lesson 10: Dividing by 10 and 100

➜ pages 147–149

1. a) The mass of each box is 4·5 kg.
b) The mass of each bowl is 0·3 kg.

2. 83 ÷ 10 = 8·3

3. Circled: 3 hundredths

4. a) 5·6, 0·56 c) 7·2, 0·72
b) 34, 34 d) 10, 100

5. a) 6·8 d) 10
b) 0·46 e) 97
c) 0·18 f) 0

6. a) Danny would get the answer 0·96.
96 ÷ 10 = 96 so Danny started with the number 96.
96 ÷ 100 = 0·96
b) Bella would get the answer 0·7.
7 ÷ 100 = 0·07 so Bella started with the number 7.
7 ÷ 10 = 0·7

7. $\frac{1}{10}$ of 7 is 0·7
$\frac{1}{100}$ of 70 is 0·7
So $\frac{1}{10}$ of 7 is equal to $\frac{1}{100}$ of 70.

Reflect

Explanations may vary; for example:

The values of the digits change but the order of the digits remains the same. The digits move one column to the right when dividing by 10 and 2 columns to the right when dividing by 100.

So, (answer when you divide a number by 100) = (answer when you divide a number by 10) ÷ 10

End of unit check

➜ pages 150–151

My journal

1. 1·34, 1·43, 3·14, 3·41, 4·13, 4·31, 13·4, 14·3, 31·4, 34·1, 41·3, 43·1

2. Different answers possible. Look for children confidently identifying the values of the digits. Pictorial representations could include place value grids, hundredths grids and part-whole models.

Power play

Check that children can understand the game and play it correctly.

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