Reasoning and Problem Solving
Step 3: Tenths on a Place Value Grid

National Curriculum Objectives:

Mathematics Year 4: (4F6b) Recognise and write decimal equivalents of any number of tenths or hundredths

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Explain which representation is the odd one out, using fractions and decimals greater than 1 whole. Pictorial support for all questions.
Expected Explain which representation is the odd one out, using fractions and decimals greater than 1 whole.
Greater Depth Explain which representation is the odd one out, using only fractions and decimals greater than 1 whole.

Questions 2, 5 and 8 (Problem Solving)
Developing Use clues to work out a decimal number, using fractions and decimals less than 1 whole.
Expected Use clues to work out a decimal number, using some decimals more than 1.
Greater Depth Use the clues to work out a decimal number, using only fractions and decimals greater than 1 whole.

Questions 3, 6 and 9 (Reasoning)
Developing Explain if a decimal number has been represented correctly on a place value grid, using fractions and decimals less than 1 whole.
Expected Explain if a decimal number has been represented correctly on a place value grid, using some decimals greater than 1 whole.
Greater Depth Explain if a decimal number has been represented correctly on a place value grid, using only fractions and decimals greater than 1 whole.

More Year 4 Decimals resources.

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Tenths on a Place Value Grid

1a. Which is the odd one out?

A.

Ones	Tenths
3	3

B.

Ones	Tenths
1 1 1	0.1 0.1

C.

Ones	Tenths
1 1 1	0.1 0.1 0.1

Explain your answer.

D R

Tenths on a Place Value Grid

1b. Which is the odd one out?

A.

Ones	Tenths
	0.1 0.1 0.1 0.1 0.1

B.

Ones	Tenths
0	5

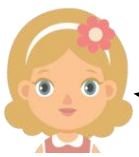
C.

Ones	Tenths
	0.1 0.1 0.1 0.1

Explain your answer.

D R

2a. Meghan spilt paint on her place value grid. She says,



I had fewer than 9 counters. The tenths column has an even number and is less than one whole.

Ones	Tenths

What decimal numbers could Meghan have made?

D PS

2b. Aaron spilt juice on his place value grid. He says,



I had fewer than 10 counters. The tenths column has an odd number and is less than one whole.

Ones	Tenths

What decimal numbers could Aaron have made?

D PS

3a. Michael is using a place value grid to make decimal numbers. He says,



I have made 1.5 using 6 counters.

Ones	Tenths
1	0.1 0.1 0.1 0.1

Is Michael correct? Prove it.

D R

3b. Polly is using a place value grid to make decimal numbers. She says,



I have made 3.7 using 10 counters.

Ones	Tenths
1 1 1 1	0.1 0.1 0.1 0.1 0.1 0.1

Is Polly correct? Prove it.

D R

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Tenths on a Place Value Grid

4a. Which is the odd one out?

A.

Ones	Tenths
3	2

B. two ones and three tenths

C.

Ones	Tenths
● ●	● ● ●

Explain your answer.

E R

Tenths on a Place Value Grid

4b. Which is the odd one out?

A.

Ones	Tenths
3	7

B. three ones and eight tenths

C.

Ones	Tenths
● ● ●	● ● ● ● ● ●

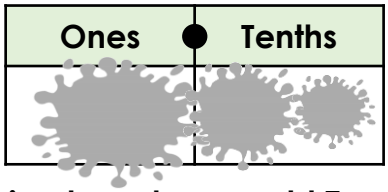
Explain your answer.

E R

5a. Zoe spilt ink on her place value grid. She says,



I used exactly 8 counters. There is an even number in the ones column.



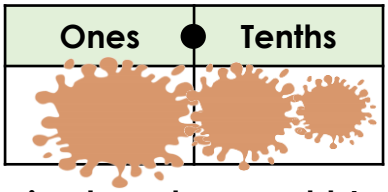
What decimal numbers could Zoe have made?

E PS

5b. Josh spilt ketchup on his place value grid. He says,



I used exactly 9 counters. There is an odd number in the tenths column.



What decimal numbers could Josh have made?

E PS

6a. Jordan is using a place value grid to make decimal numbers. He says,



I have made 3.4 using 6 counters.

Ones	Tenths
● ● ●	● ● ●

Is Jordan correct? Prove it.

E R

6b. Sarah is using a place value grid to make decimal numbers. She says,



I have made 5.7 using 13 counters.

Ones	Tenths
● ● ● ● ● ●	● ● ● ● ● ● ●

Is Sarah correct? Prove it.

E R

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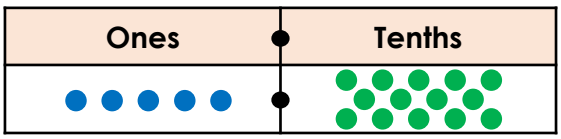
Tenths on a Place Value Grid

7a. Which is the odd one out?

A. five ones and fifteen tenths

B. 6.4

C.



Explain your answer.

GD

R

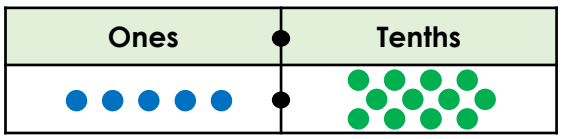
Tenths on a Place Value Grid

7b. Which is the odd one out?

A. $7\frac{2}{10}$

B. six ones and twelve tenths

C.



Explain your answer.

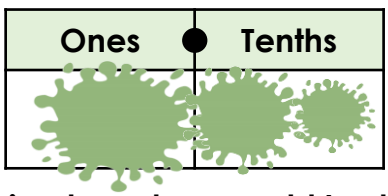
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R

8a. Ivy spilt nail varnish on her place value grid. She says,



I used 23 counters. There is an even number in the ones column and there are more than 10 tenths.



What decimal numbers could Ivy have made?

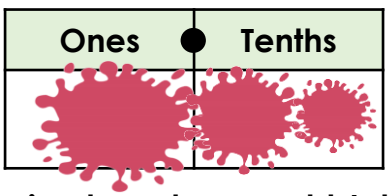
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PS

8b. Jake got soda on his place value grid. He says,



I used 27 counters. There is an odd number in the ones column and there are more than 11 tenths.



What decimal numbers could Jake have made?

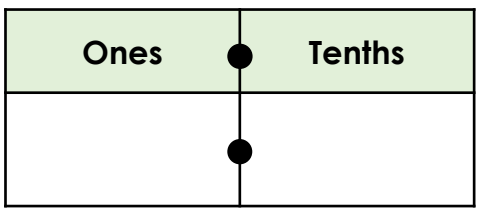
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PS

9a. Joseph is using a place value grid to make decimal numbers. He says,



I have 28 counters. I can use these counters to make 3.7 only two ways.



Is Joseph correct? Prove it.

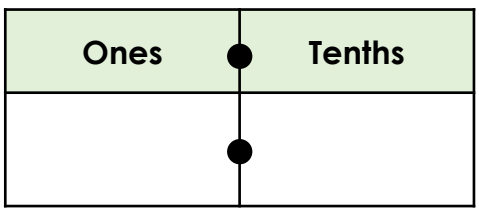
GD

R

9b. Pippa is using a place value grid to make decimal numbers. She says,



I have 35 counters. I cannot make 4.4 using all of my counters.



Is Pippa correct? Prove it.

GD

R

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Reasoning and Problem Solving
Tenths on a Place Value Grid

Developing

1a. B is the odd one out because it shows 3.2 not 3.3.

2a. 0.2, 0.4, 0.6, 0.8

3a. Michael is incorrect. He should have put 5 counters in the tenths column and 1 counter in the ones column. He has only used 5 counters and has made 1.4.

Expected

4a. A is the odd one out because it shows 3.2 not 2.3.

5a. 2.6, 4.4, 6.2, 8.0

6a. Jordan is incorrect. He hasn't got enough counters to make 3.4. He needs one more tenth for his number to be correct.

Greater Depth

7a. A is the odd one out because it shows 5 and four tenths not 6.4.

8a. Various answers, for example: 11.3 (10 ones, 13 tenths); 9.5 (8 ones, 15 tenths); 7.7 (6 ones, 17 tenths)

9a. Joseph is incorrect. He can make 3.7 in 3 different ways: 1 one and 27 tenths, 2 ones and 17 tenths, 3 ones and 7 tenths.

Reasoning and Problem Solving
Tenths on a Place Value Grid

Developing

1b. C is the odd one out because it shows 0.4 not 0.5.

2b. 0.1, 0.3, 0.5, 0.7, 0.9

3b. Polly is incorrect. She put 4 counters in the ones column and 6 in the tenths column. She needs to move 1 counter from the ones column to the tenths.

Expected

4b. B is the odd one out because it shows 3.8 not 3.7.

5b. 0.9, 2.7, 4.5, 6.3, 8.1

6b. Sarah is incorrect. She has made 6.7. She needs to remove one of the counters from the ones column to make 5.7.

Greater Depth

7b. C is the odd one out because it shows 5 ones and 12 tenths which is 6.2 not 7.2.

8b. Various answers, for example: 16.2 (15 ones, 12 tenths); 14.4 (13 ones, 14 tenths); 12.6 (11 ones, 16 tenths); 10.8 (9 ones, 18 tenths)

9b. Pippa is incorrect. She could make 4.4 using 35 counters by putting 1 counter in the ones column and 34 in the tenths.

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