Reasoning and Problem Solving
Step 3: Divide by 10, 100 and 1,000

National Curriculum Objectives:

Mathematics Year 6: (6F9a) Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to three decimal places

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Find the odd one out when dividing numbers with up to 1 decimal place by 10, 100 and 1,000 with some use of zero.
Expected Find the odd one out when dividing numbers with up 2 decimal places by 10, 100 and 1,000 with some use of zero.
Greater Depth Find the odd one out when dividing numbers with up to 2 decimal places by multiples of 10, 100 and 1,000 where numbers include zeros. Some questions include dividing by multiples of these numbers.

Questions 2, 5 and 8 (Reasoning)
Developing Identify the correct statement and explain reasoning. Statements involve dividing numbers with up to 1 decimal place by 10, 100 and 1,000 with some use of zero.
Expected Identify the correct statement and explain reasoning. Statements involve dividing numbers with up 2 decimal places by 10, 100 and 1,000 with some use of zero. Some conversion between units of measure included.
Greater Depth Identify the correct statement and explain reasoning. Statements involve dividing numbers with up to 2 decimal places by multiples of 10, 100 and 1,000 where numbers include zeros. Some questions include dividing by multiples of these numbers.

Questions 3, 6 and 9 (Problem Solving)
Developing Use clues to solve a riddle with only one possible answer. Riddles involve dividing numbers with up to 1 decimal place by 10, 100 and 1,000 with some use of zero.
Expected Solve a riddle with only one possible answer. Riddles involve dividing numbers with up 2 decimal places by 10, 100 and 1,000 with some use of zero.
Greater Depth Solve a riddle with only one possible answer. Riddles involve dividing numbers with up to 2 decimal places by multiples of 10, 100 and 1,000 where numbers include zeros. Some questions include dividing by multiples of these numbers. Conversion between units of measure included.
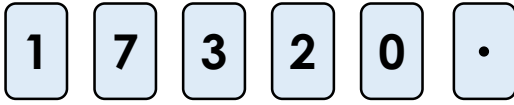
More Year 6 Decimals resources.

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1a. Use the digit cards to create answers to the calculations below. Which calculation cannot be answered? Digit cards can be used more than once.

| 1 | 7 | 3 | 2 | 0 | · |

A. 7,132 ÷ 10 =
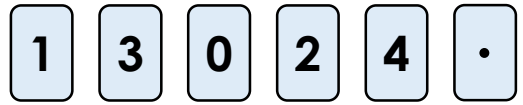
B. 7,140 ÷ 100 =

C. 721 ÷ 10 =

PS

1b. Use the digit cards to create answers to the calculations below. Which calculation cannot be answered? Digit cards can be used more than once.

| 1 | 3 | 0 | 2 | 4 | · |

A. 1,230 ÷ 100 =

B. 4,210 ÷ 10 =

C. 3,150 ÷ 100 =

PS

2a. Hafsa and Sinead are dividing numbers by 10, 100 and 1,000.

Hafsa: I think that 7,452 ÷ 100 = 74.52

Sinead: I think that 7,452 ÷ 100 = 745.2

Who is correct? Give reasons for your answer.

R

2b. Isabel and Gabriel are dividing numbers by 10, 100 and 1,000.

Isabel: I think that 2,750 ÷ 1,000 = 27.5

Gabriel: I think that 2,750 ÷ 1,000 = 2.75

Who is correct? Give reasons for your answer.

R

3a. Solve the riddle.

Flo is thinking of a number.

Flo: When multiplied by 1,000, my number becomes 6,520.

What is Flo's number?

PS

3b. Solve the riddle.

Lucy is thinking of a number.

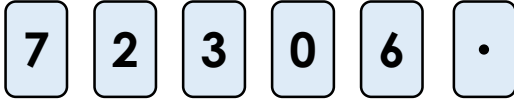**Lucy:** When multiplied by 10 the number becomes 7.6.

What is Lucy's number?

PS

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Divide by 10, 100 and 1,000

4a. Use the digit cards to create answers to the calculations below. Which calculation cannot be answered?
Digit cards can be used more than once.

| 7 | 2 | 3 | 0 | 6 | · |

A. 7,023 ÷ 100 =

B. 623 ÷ 1,000 =

C. 30.8 ÷ 10 =

PS

4b. Use the digit cards to create answers to the calculations below. Which calculation can not be answered?
Digit cards can be used more than once.

| 1 | 2 | 4 | 3 | 5 | · |

A. 5,420 ÷ 100 =

B. 405 ÷ 1,000 =

C. 13,540 ÷ 10 =

PS

5a. Alice and Cian are converting units of measure.

Alice: I think that 3,050m can be converted to 3.05km

Cian: I think that 3,050m can be converted to 30.5km

Who is correct? Give reasons for your answer.

R

5b. Jilly and Chuan are converting units of measure.

Jilly: I think that 5,690g can be converted to 5.609kg

Chuan: I think that 5,690g can be converted to 5.69kg

Who is correct? Give reasons for your answer.

R

6a. Solve the riddle.

Josh is thinking of a number.

Josh: My number is between 10 and 30. When multiplied by 100 the number becomes 2,155.

What is Josh's number?

PS

6b. Solve the riddle.

Maisie is thinking of a number.

Maisie: My number is between 5 and 10. When multiplied by 1,000 the number becomes 7,185.
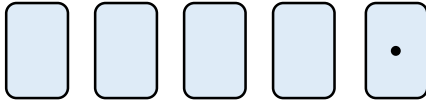
What is Maisie's number?

PS

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Reasoning and Problem Solving – Divide by 10, 100 and 1,000 – Year 6 Expected

7a. Complete the digit cards to create answers to two calculations below. Which calculation can not be answered using your digit cards?

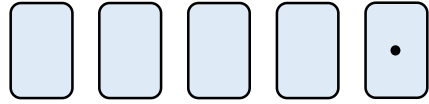▢ ▢ ▢ ▢ ▢·

A. $423.1 ÷ 10 =$ ☐

B. $4,826 ÷ 200 =$ ☐

C. $4,512 ÷ 100 =$ ☐

Change one digit card to answer the odd one out.

PS

7b. Complete the digit cards to create answers to the calculations below. Which calculation can not be answered using your digit cards?

▢ ▢ ▢ ▢ ▢·

A. $6,428 ÷ 20 =$ ☐

B. $162.4 ÷ 10 =$ ☐

C. $4,123 ÷ 100 =$ ☐

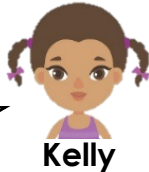Change one digit card to answer the odd one out.

PS

8a. Jacob and Kelly are dividing numbers by 200.

Jacob: When I calculate $2,802 ÷ 200$, I will divide by 100 and double the answer to get 56.04.

Kelly: When I calculate $2,802 ÷ 200$, I will divide by 100 and halve the answer to get 14.01.

Who is correct? Give reasons for your answer.

R

8b. Sean and Ali are dividing numbers by 2,000.

Sean: When I calculate $4,608 ÷ 2,000$, I will divide by 1,000 and halve the answer to get 2.304.

Ali: When I calculate $4,608 ÷ 2,000$, I will divide by 1,000 and double the answer to get 9.216.

Who is correct? Give reasons for your answer.

R

9a. Solve the riddle.

Ian is thinking of a number.

Ian: My number has 3 decimal places and is between 7kg and 8kg. When converted to grams, the hundreds digit is 6 and the tens digit is 9.

What could Ian's number be? Find 3 possible answers. Give your answer in kg.

PS

9b. Solve the riddle.

Dylan is thinking of a number.

Dylan: My number has 3 decimal places and is between 4L and 5L. When converted to millilitres, the tens digit is 2 and the ones digit is 8.

What could Dylan's number be? Find 3 possible answers. Give your answer in L.

PS

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Reasoning and Problem Solving – Divide by 10, 100 and 1,000 – Year 6 Greater Depth

Reasoning and Problem Solving
Divide by 10, 100 and 1,000

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Divide by 10, 100 and 1,000

Developing

1a. A = 713.2; B = 71.4 (it cannot be made using the digit cards); C = 72.1

2a. Hafsa is correct. She has moved the digits 2 places to the right. Sinead has divided by 10.

3a. 6.52

Expected

4a. A = 70.23; B = 0.623; C = 3.08 (it cannot be made using the digit cards)

5a. Alice is correct. She has divided 3,050m by 1,000. Cian is incorrect as he divided by 100.

6a. 21.55

Greater Depth

7a. Digit cards: 1, 2, 3 and 4.
A = 423.1; B = 24.13; C = 45.12 (it is the odd one out)
To answer the odd one out, change the 3 for a 5.

8a. Kelly is correct. The answer is 14.01 as 2,802 ÷ 100 = 28.02 and then halved to equal 14.01.

9a. Various answers, for example: 7.690kg, 7.691kg and 7.692kg

Developing

1b. A = 12.3; B = 421; C = 31.5 (it cannot be made with the digit cards)

2b. Gabriel is correct. He has moved the digits 3 place to the right. Isabel has divided by 100.

3b. 0.76

Expected

4b. A = 54.2; B = 0.405 (it cannot be made using the digit cards); C = 1,354

5b. Chuan is correct. He has divided 5,690g by 1,000. Jilly has also divided by 1,000, but she has done so incorrectly.

6b. 7.185

Greater Depth

7b. Digit cards: 1, 2, 3, and 4.
A = 321.4; B = 16.24 (it is the odd one out)
C = 41.23
To answer the odd one out, change the 3 for a 6.

8b. Sean is correct. The answer is 2.304 as 4,608 ÷ 1,000 = 4.608 and then halved to equal 2.304.

9b. Various answers, for example: 4.728L, 4.828L and 4.928L