

# Reasoning and Problem Solving

## Step 2: Multiplying 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 (Reasoning)

**Developing** Identify and replicate a sequence by multiplying a 1-digit or 2-digit number with up to 2 decimal places by 10, 100 and 1,000 (no zeros).

**Expected** Identify and replicate a sequence by multiplying up to 3 digit numbers with up to 3 decimal places by 10, 100 and 1,000 (including zeros).

**Greater Depth** Identify and replicate a sequence by multiplying up to 3 digit numbers with up to 3 decimal using known multiplication facts and commutativity.

Questions 2, 5 and 8 (Reasoning)

**Developing** Explain why a statement regarding a 2-digit number with up to 2 decimal places being multiplied by 10, 100 or 1,000 is incorrect (no zeros).

**Expected** Explain why a statement regarding a 3-digit number with up to 3 decimal places being multiplied by 10, 100 or 1,000 is incorrect (including zeros).

**Greater Depth** Explain why a statement regarding a 3-digit number with up to 3 decimal places being multiplied by known multiplication facts and commutativity.

Questions 3, 6 and 9 (Problem Solving)

**Developing** Predict and prove which calculation has the highest value based on multiplying a 2-digit number with up to 2 decimal places by 10, 100 and 1,000 (no zeros).

**Expected** Predict and prove which calculation has the highest value based on multiplying up to 3-digit numbers with up to 3 decimal places by 10, 100 and 1,000 (including zeros).

**Greater Depth** Predict and prove which calculation has the highest value based on multiplying up to 3-digits number with up to 3 decimal places using known multiplication facts and commutativity.

[More resources](#) which follow the same small steps as White Rose.

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## Multiplying by 10, 100 and 1,000

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1a. Look at the following number sequences.

10, 100, 1,000

7.6, 76, 760

81.54, 815.4, 8,154

Create your own 3 number sequence following this pattern. Explain what the pattern is.



R

1b. Look at the following number sequences.

20, 200, 2,000

9.3, 93, 9,300

57.24, 572.4, 5,724

Create your own 3 number sequence following this pattern. Explain what the pattern is.



R

2a. Joe and Faith are multiplying numbers by 100.



If I multiply the number 2.15 by 100 I get 2.1500

You are incorrect. The answer would be 215.



Is either of them correct? Explain your answer.



R

2b. Nathan and Diyaa are multiplying numbers by 10.

If I multiply the number 8.32 by 10 I get 8.320.



You are incorrect. The answer would be 83.2.

Is either of them correct? Explain your answer.



R

3a. Predict which sum will give the largest number. Prove it.

A  $5.61 \times 10 =$

B  $19.42 \times 100 =$

C  $17.9 \times 1,000 =$



PS

3b. Predict which sum will give the largest number. Prove it.

A  $92.56 \times 10 =$

B  $81.4 \times 100 =$

C  $46.77 \times 1,000 =$



PS

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4a. Look at the following number sequences.

15, 150, 1,500

76.1, 761, 7,610

2.446, 24.46, 244.6

Create your own 3 number sequence following this pattern. Explain what the pattern is.



R

4b. Look at the following number sequences.

26.25, 262.5, 2,625

6.874, 68.73, 687.4

94.65, 946.5, 9,465

Create your own 3 number sequence following this pattern. Explain what the pattern is.



R

5a. Colin and Amali are multiplying numbers by 100.



If I multiply the number 297.50 by 100 I get 297.500.

You are incorrect. The answer would be 29,750.



Is either of them correct? Explain your answer.



R

5b. Rudy and Tiffany are multiplying numbers by 1,000.

If I multiply the number 73.503 by 1,000 I get 73.503000.



You are incorrect. The answer would be 73,503.

Is either of them correct? Explain your answer.



R

6a. Predict which sum will give the largest number. Prove it.

A  $563.06 \times 10 =$

B  $51.94 \times 100 =$

C  $0.490 \times 1,000 =$



PS

6b. Predict which sum will give the largest number. Prove it.

A  $22.56 \times 10 =$

B  $921.42 \times 100 =$

C  $6.730 \times 1,000 =$



PS

## Multiplying by 10, 100 and 1,000

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7a. Look at the following number sequences.

2.348, 23.48, 234.8

59.27, 592.7, 5,927

875.30, 8,753, 87,530

Create your own 3 number sequence following this pattern. Explain what the pattern is.



R

7b. Look at the following number sequences.

7.754, 77.54, 775.4

33.64, 336.4, 3,364

276.22, 2,762.2, 27,622

Create your own 3 number sequence following this pattern. Explain what the pattern is.



R

8a. Isabella and Saif are multiplying numbers by 100.



If I multiply the number 432.780 by 10 x 10 I get 432.7800.

You are incorrect. The answer would be 432,780.



Is either of them correct? Explain your answer.



R

8b. Robert and Angel are multiplying numbers by 100.

If I multiply the number 923.932 by 100 I get 923.93200.



You are incorrect. The answer would be 92,393.2.

Is either of them correct? Explain your answer.



R

9a. Predict which sum will give the largest number. Prove it.

A  $81.006 \times 20 =$

B  $302.413 \times 10 \times 10 =$

C  $76.202 \times 1,000 =$



PS

9b. Predict which sum will give the largest number. Prove it.

A  $762.127 \times 30 =$

B  $45.721 \times 100 =$

C  $53.375 \times 100 \times 10 =$



PS

## Reasoning and Problem Solving Multiplying by 10, 100 and 1,000

### Developing

- 1a. Various possible answers which follow the pattern of multiplying the first number by 10 and then multiplying by 10 again.
- 2a. Faith is correct because Joe has only added 2 zeros to his number and not multiplied by 100.
- 3a.  $A = 56.1$ ,  $B = 1,942$ ,  $C = 17,900$  so C is the largest number.

### Expected

- 4a. Various possible answers which follow the pattern of multiplying the first number by 10 and then multiplying by 10 again.
- 5a. Amali is correct because Colin has only added 2 zeros onto his number and not multiplied it by 100.
- 6a.  $A = 5,630.6$ ,  $B = 5,194$ ,  $C = 490$  so A is the largest number.

### Greater Depth

- 7a. Various possible answers which follow the pattern of multiplying the first number by 10 and then multiplying by 10 again.
- 8a. Both children are incorrect. Isabella has only added on 2 zeros onto her number and not multiplied by 100 and Saif has multiplied by 1,000.
- 9a.  $A = 1,620.12$ ,  $B = 30,241.3$ ,  $C = 76,202$  so C is the largest number.

## Reasoning and Problem Solving Multiplying by 10, 100 and 1,000

### Developing

- 1b. Various possible answers which follow the pattern of multiplying the first number by 10 and then multiplying by 10 again.
- 2b. Diyaa is correct because Nathan has only added on one zero to his number and not multiplied by 10.
- 3b.  $A = 926$ ,  $B = 8,140$ ,  $C = 46,770$  so C is the largest number.

### Expected

- 4b. Various possible answers which follow the pattern of multiplying the first number by 10 and then multiplying by 10 again.
- 5b. Tiffany is correct because Rudy has only added 3 zeros onto his number and not multiplied by 1,000.
- 6b.  $A = 225.6$ ,  $B = 92,142$ ,  $C = 6,730$  so B is the largest number.

### Greater Depth

- 7b. Various possible answers which follow the pattern of multiplying the first number by 10 and then multiplying by 10 again.
- 8b. Angel is correct because Robert has only added 2 zeros onto his number and not multiplied by 100.
- 9b.  $A = 22,863.81$ ,  $B = 4,572.1$ ,  $C = 53,375$  so C is the largest number.