Reasoning and Problem Solving
Step 1: Numbers to 10,000

National Curriculum Objectives:

Mathematics Year 5: (5N2) Read, write, order and compare numbers to at least 1 000 000
Mathematics Year 5: (5N3a) Determine the value of each digit in numbers up to 1 000 000

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Explain if the numbers have been represented correctly using numbers up to 10,000. Zero not used as a place holder. Conventional partitioning and numerals used.
Expected Explain if the numbers have been represented correctly using numbers up to 10,000. Zero used as a place holder. Mixed pictorial representations used. Conventional partitioning and numerals used.
Greater Depth Explain if the numbers have been represented correctly using numbers up to 10,000. Zero used as a place holder. Mixed pictorial representations used. Unconventional partitioning, numerals and words used.

Questions 2, 5 and 8 (Reasoning)
Developing Explain the mistake when adding 10, 100 and 1,000. No bridging or exchanging included. No zero as a place holder used. Numerals only.
Expected Explain the mistake when adding or subtracting 10, 100 or 1,000 involving bridging or exchanging. Zero used as a place holder. Numerals only.
Greater Depth Explain the mistake when adding or subtracting 10, 100 or 1,000 involving bridging or exchanging. Zero used as a place holder. Two step problem.

Questions 3, 6 and 9 (Problem Solving)
Developing Solve the clues to complete the place value grid. Three clues presented in order. Clues include adding or subtracting 10, 100 or 1,000 with no bridging or exchanging. Conventional partitioning used.
Expected Solve the clues to complete the place value grid. Three clues presented out of order. Clues include adding or subtracting 10, 100 or 1,000 with bridging or exchanging. Conventional partitioning used.
**Greater Depth** Solve the clues to find the missing digits. Three clues presented out of order. Clues include adding or subtracting 10, 100 or 1,000 with bridging or exchanging. Unconventional partitioning used.

More Year 5 Place Value resources.

Did you like this resource? Don't forget to review it on our website.

1a. Eddie has represented 4,563 in different ways.

A

B

4,563			
4,000	500	60	3

D Is he correct? How do you know?

R
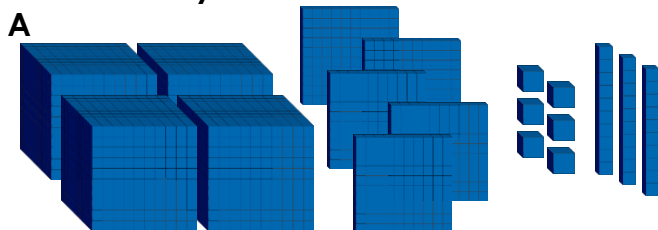
1b. Wren represents 1,252 in different ways.

A

Th	H	T	O
●	● ●	● ● ● ● ●	● ● ●

B
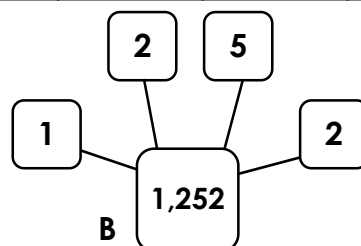
D Is she correct? How do you know?

R

2a. Ahmed says,

> When I add 100 to 2,847 my answer is 2,857.

Explain his mistake.

D

R

2b. Sadie says,

> When I add 1,000 to 3,651 my answer is 4,000.

Explain her mistake.

D

R

3a. Use the clues to find the number. Draw counters and write the number in digits.

Th	H	T	O
	● ● ●		

- The thousands column has three more counters than the hundreds column.
- 4,735 – 10 has the same number of tens as this number.
- The sum of the counters in the tens and ones columns is 8.

D

PS

3b. Use the clues to find the number. Draw counters and write the number in digits.
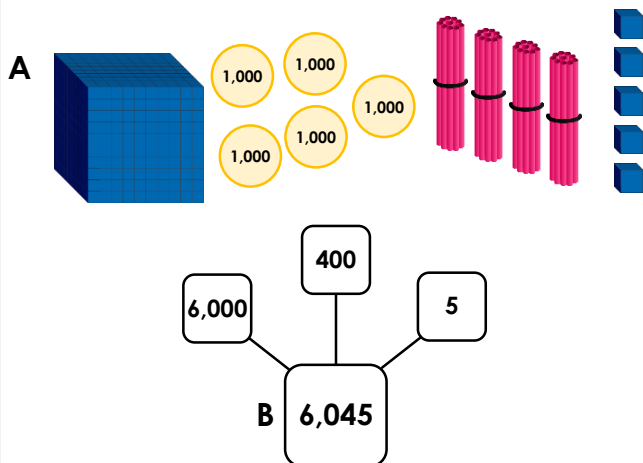
Th	H	T	O
			● ● ● ● ●

- There are five fewer counters in the thousands column than the ones.
- The sum of the counters in the hundreds and ones columns is 8.
- 4,834 – 10 has the same number of tens as this number.

D

PS

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4a. Arlo represents 6,045 in different ways.

A

400

6,000 — 400 — 5

B 6,045

⭐ **E** Is he correct? How do you know?

R

4b. Libby represents 7,230 in different ways.

A 7,230

7,000 ◄————————► 8,000

B

7,230		
7,000	100 100	30
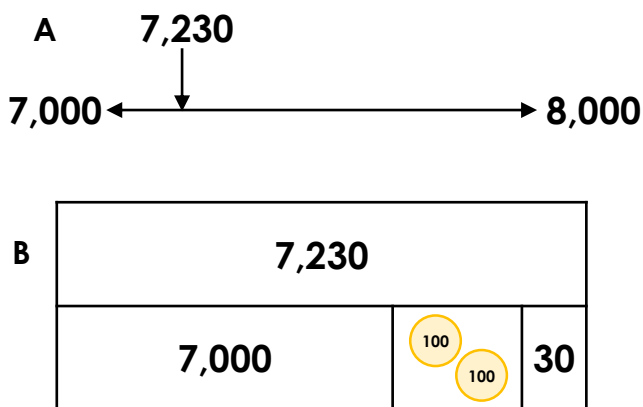
⭐ **E** Is she correct? How do you know?

R

5a. Hugo says,

> When I add 10 to 3,095 my answer is 3,015.

Explain his mistake.

⭐ **E**

R

5b. Charlotte says,

> When I subtract 100 from 5,049 my answer is 5,949.

Explain her mistake.

⭐ **E**

R

6a. Use the clues to find the number. Draw counters and write the number in digits.

Th	H	T	O
●●●●●●●			

- The ones column has 3 fewer counters than the tens column.
- 22 counters are used in total.
- 1,602 – 10 has the same number of tens as this number.

⭐ **E**

PS

6b. Use the clues to find the number. Draw counters and write the number in digits.

Th	H	T	O
		●●●●	

- The hundreds column has the same number of counters as the ones.
- 12 counters are used in total.
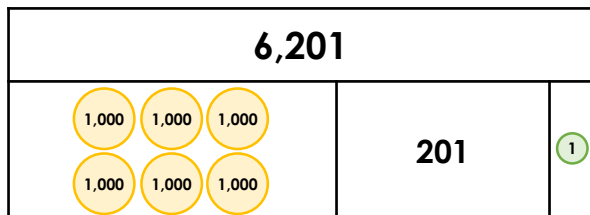- 7,980 + 100 has the same number of thousands as this number.

⭐ **E**

PS

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Reasoning and Problem Solving – Numbers to 10,000 – Year 5 Expected

Numbers to 10,000

7a.
Umar represents 6,201 in different ways.

A

6,201		
1,000 1,000 1,000 1,000 1,000 1,000	201	1

B

6,201

6,000 ←——————→ 7,000

⭐ GD **Is he correct? How do you know?**   R

7b.
Paula represents 3,160 in different ways.

A

960   Ten tens

2,000   10

3,160

B

Two thousands, eleven hundreds, six tens

⭐ GD **Is she correct? How do you know?**   R

8a.
Roman says,

When I subtract 100 from 8,096 then add 10 my answer is 7,906

Explain his mistake.

⭐ GD   R

8b.
Alannah says,

When I subtract 10 from 9,002 then add 100 my answer is 8,092

Explain her mistake.

⭐ GD   R

9a.
Use the clues below to fill in the missing digits.

Th	H	T	O
			2

- The four digits total 13.
- The thousands digit is five more than the tens digit.
- 3,391 + 10 has the same number of tens as this number.

⭐ GD   PS

9b.
Use the clues below to fill in the missing digits.

Th	H	T	O
4			

- The four digits total 15.
- 8,920 + 100 has the same number of hundreds as this number.
- The tens digit is three more than the thousands digit.

⭐ GD   PS

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Reasoning and Problem Solving – Numbers to 10,000 – Year 5 Greater Depth

Reasoning and Problem Solving
Numbers to 10,000

Developing

1a. Diagram A is incorrect as it has 6 ones and 3 tens which shows 4,536. Diagram B represents 4,563 correctly.

2a. Ahmed has added 10 to his number rather than 100. His answer should be 2,947.

3a. 6,326

Developing

1b. Diagram A represents 1,225 correctly. Diagram B is incorrect – it should show 1,000 + 200 + 50 + 2.

2b. Sadie has added 1,000 to the thousands column, but has not kept all the other digits the same. Her answers should be 4,651.

3b. 1,226

Expected

4a. Diagram A represents 6,045 correctly. Diagram B is incorrect – it should show 600 + 40 + 5.

5a. Hugo has added 10 the tens column which means it changes from 9 to 0, but he has not remembered that the hundreds column will also change because of the exchange. His answer should be 3,105.

6a. 7,096

Expected

4b. Diagram A is incorrect because 7,230 is almost one quarter of the way between 7,000 and 8,000 – the arrow should be roughly one quarter of the way along the number line. Diagram B is correct as it shows 7,230.

5b. Charlotte has not exchanged the one of the thousands for ten hundreds in order to subtract 100. Her answer should be 4,949.

6b. 8,040

Greater Depth

7a. Diagram A is incorrect because it represents 6,202. Diagram B represents 6,201 correctly because 6,201 is just less than one quarter of the way along the line.

8a. Roman has subtracted 100 from 8,096 to get 7,996 but when he added 10, he changed the tens and ones columns accordingly but didn't change the thousands and hundreds columns. His answer should be 8,006.

9a. 5,602

Greater Depth

7b. Diagram A is incorrect because it shows 2,000 + 960 + 100 + 10 = 3,070. Diagram B represents 3,160 correctly because it shows 2,000 + 1,100 + 60 = 3,160.

8b. Alannah has subtracted 10 from 9,002 to get 8,992 but when she added 100, she changed the hundreds and tens columns accordingly but didn't change the thousands column. Her answer should be 9,092.

9b. 4,074

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Reasoning and Problem Solving – Numbers to 10,000 ANSWERS