Reasoning and Problem Solving
Step 2: 3-digit Numbers and Ones

National Curriculum Objectives:

Mathematics Year 3: (3C1) Add and subtract numbers mentally, including three-digit numbers and ones

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing One-step word problem adding or subtracting ones from a 3-digit number (no bridging or exchanging).
Expected Two-step word problem adding or subtracting ones from a 3-digit number (no bridging or exchanging).
Greater Depth Two-step word problem adding and subtracting ones from a 3-digit number (no bridging or exchanging).

Questions 2, 5 and 8 (Problem Solving)
Developing One-step problem adding or subtracting ones from 3-digit numbers (no bridging or exchanging) using pictorial representations (Base 10). Only one possible answer.
Expected One-step problem adding or subtracting ones from 3-digit numbers (no bridging or exchanging) using pictorial representations (place value counters). Various possible answers.
Greater Depth One-step problem adding or subtracting ones from 3-digit numbers (no bridging or exchanging) using numerals only. Various possible answers.

Questions 3, 6 and 9 (Reasoning)
Developing Two 3-digit numbers represented on place value charts. Statement provided to explain what has happened (no bridging or exchanging). Identify if the statement is correct or not. Explain the answer.
Expected One 3-digit number represented on a place value chart. Statement provided to explain a possible calculation and answer (no bridging or exchanging). Identify if the statement is correct or not. Explain the answer.
Greater Depth One 3-digit number given in words. Statement provided to explain a possible calculation and answer (no bridging or exchanging). Identify if the statement is correct or not. Explain the answer.

More resources which follow the same small steps as White Rose.

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Reasoning and Problem Solving – 3-digit Numbers and Ones

1a. There are 234 people at the circus.

A family of four arrive late.
How many people are at the circus now?

Show your working out.

D

PS

1b. There are 348 people at the supermarket.

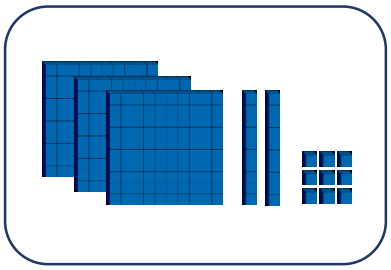
Seven people buy their shopping and leave.
How many people are at the supermarket now?

Show your working out.

D

PS

2a. Tia is representing 329 using Base 10.



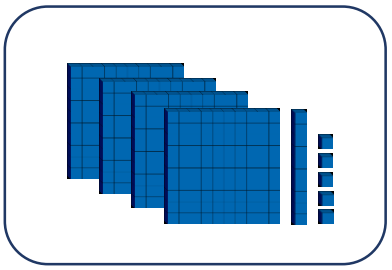
She gives 5 ones to Poppy.

How much is she left with?

D

PS

2b. Reggie is representing 415 using Base 10.



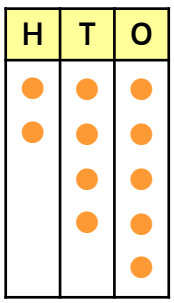
Harry gives him 4 more ones.

How much does Reggie have now?

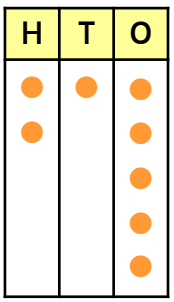
D

PS

3a. Lee has changed the place value chart from A to B.



A



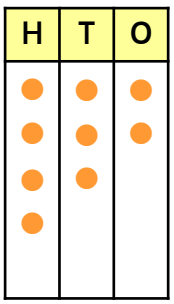
B

Lee thinks he has subtracted 3 ones. Is he correct? Explain why or why not.

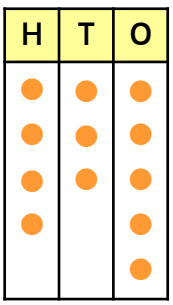
D

R

3a. Lucy has changed the place value chart from A to B.



A



B

Lucy thinks she has added 4 ones. Is she correct? Explain why or why not.

D

R

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Reasoning and Problem Solving – 3-digit Numbers and Ones

4a. There are 528 people on a train.

Three get off at the Library.

Two more get off at the park.

How many people are left on the train?

Write down the calculations you used.

E PS

4b. There are 641 pupils at a school.

Four arrive late after registration.

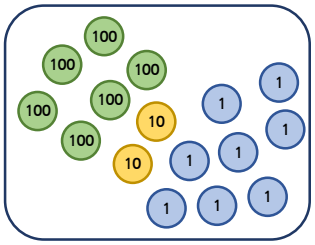
Three come back from a music exam.

How many pupils are now at school?

Write down the calculations you used.

E PS

5a. Lisa is representing 628 using place value counters.

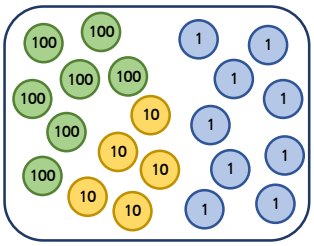


She takes away an even number of ones counters.

Write down all the numbers she could be left with.

E PS

5b. Eli is representing 759 using place value counters.

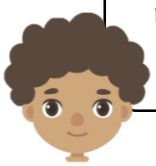


He takes away an odd number of ones counters.

Write down all the numbers he could be left with.

E PS

6a. Jay is representing a number on a place value chart.
He says,



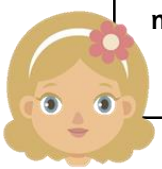
If I add 7 to my number, I will now have 782.

H	T	O
●	●	●
●		●
●		
●		
●		
●		
●		

Is Jay correct?
Explain why or why not.

E R

6b. Ella is representing a number on a place value chart.
She says,



If I subtract 6 from my number, I will be left with 136.

H	T	O
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●	●	●
●		●
●		●
●		●
●		

Is Ella correct?
Explain why or why not.

E R

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Reasoning and Problem Solving – 3-digit Numbers and Ones

7a. There are 826 people staying at a hotel.

A family of three arrive on Monday.
Six people leave on Tuesday.
How many people are now staying at the hotel?
Write down the calculations you used to work out the answer.

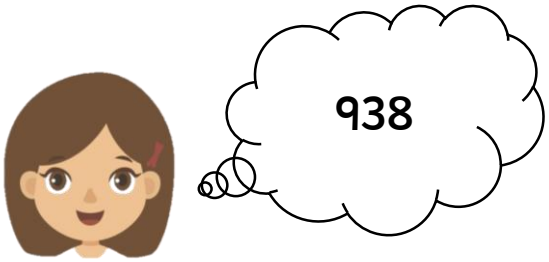
GD PS

7b. There are 608 people at the cinema.

Four leave early to catch a train.
Five arrive late after queuing in traffic.
How many people are there now in the cinema?
Write down the calculations you used to work out the answer.

GD PS

8a. Cora is thinking of a number.

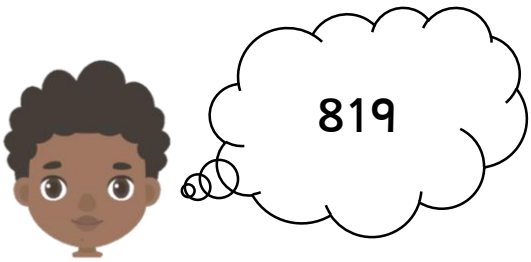


She takes away an odd number of ones but no tens or hundreds.

Write down all the numbers she could be left with.

GD PS

8b. Ben is thinking of a number.

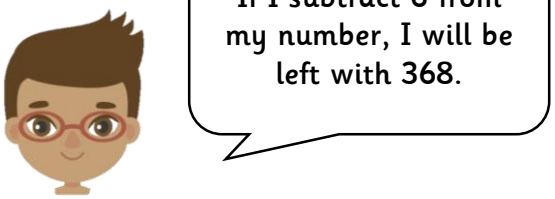


He takes away an even number of ones but no tens or hundreds.

Write down all the numbers he could be left with.

GD PS

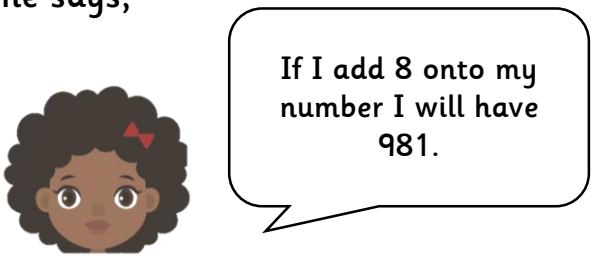
9a. Leo's starting number is 968.
He says,



Is Leo correct?
Explain why or why not.

GD R

9b. Macey's starting number is 181.
She says,



Is Macey correct?
Explain why or why not.

GD R

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Reasoning and Problem Solving – 3-digit Numbers and Ones

Developing

1a. 234 + 4 = 238
1b. 348 – 7 = 341
2a. Tia has 324 left.
2b. Reggie has 419.
3a. Lee is incorrect. He has taken three from the tens column instead of the ones column.
3b. Lucy is incorrect. She has added three, not four, to the ones.

Expected

4a. 528 – 3 = 525; 525 – 2 = 523
4b. 641 + 4 = 645; 645 + 3 = 648
5a. 628 – 2 = 626; 628 – 4 = 624; 628 – 6 = 622; 628 – 8 = 620
5b. 759 – 1 = 758; 759 – 3 = 756; 759 – 5 = 754; 759 – 7 = 752; 759 – 9 = 750
6a. Jay is incorrect. He has added 7 to the tens column instead of the ones column. He should have 719.
6b. Ella is incorrect. She has taken 6 from the hundreds column instead of the ones column. She should have 730.

Greater Depth

7a. 826 + 3 = 829; 829 – 6 = 823
7b. 608 – 4 = 604; 604 + 5 = 609
8a. 938 – 7 = 931; 938 – 5 = 933; 938 – 3 = 935; 938 – 1 = 937
8b. 819 – 8 = 811; 819 – 6 = 813; 819 – 4 = 815; 819 – 2 = 817
9a. Leo is incorrect. He has subtracted 6 hundreds instead of 6 ones. He should have 962.
9b. Macey is incorrect. She has added 8 onto the hundreds column instead of the ones column. She should have 189.

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