Reasoning and Problem Solving
Step 9: Pattern Spotting

National Curriculum Objectives:

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

Mathematics Year 3: (3C4) Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Identify 2 functions used in a function machine, using knowledge of spotting patterns to add and subtract up to three-digit numbers with no bridging. Using Base 10 and numerals.
Expected Identify 2 functions used in a function machine, using knowledge of spotting patterns to add and subtract up to three-digit numbers where bridging takes place. Using place value counters and numerals. Numerals represented as words within some questions.
Greater Depth Identify 2 functions used in a function machine, using knowledge of spotting patterns to add and subtract up to three-digit numbers where bridging takes place. Using mixed representations of numerals and words within the same question. No pictorial support.

Questions 2, 5 and 8 (Reasoning)
Developing Identify the odd one out and explain why, using knowledge of spotting patterns to add and subtract up to three-digit numbers with no bridging. Using Base 10 and numerals.
Expected Identify the odd one out and explain why, using knowledge of spotting patterns to add and subtract up to three-digit numbers where bridging takes place. Using place value counters and numerals. Numerals represented as words within some questions.
**Greater Depth** Identify the odd one out and explain why, using knowledge of spotting patterns to add and subtract up to three-digit numbers where bridging takes place. Using mixed representations of numerals and words within the same question. No pictorial support.

Questions 3, 6 and 9 (Problem Solving)
Developing Calculate the start number, using knowledge of spotting patterns to add and subtract up to three-digit numbers with no bridging. Using Base 10 and numerals.
Expected Calculate the start number, using knowledge of spotting patterns to add and subtract up to three-digit numbers where bridging takes place. Using place value counters and numerals. Numerals represented as words within some questions.
Greater Depth Calculate the start number, using knowledge of spotting patterns to add and subtract up to three-digit numbers where bridging takes place. Using mixed representations of numerals and words within the same question. No pictorial support.

More Year 3 Addition and Subtraction resources.

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

1a. Use the clues to find A and B in the function machine.

146 → + A → + B → 276
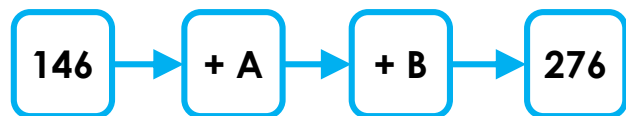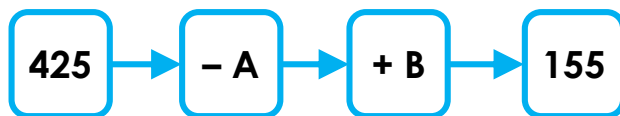
- A is a multiple of 100.
- B is a 2-digit multiple of 10.

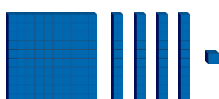**1b. Use the clues to find A and B in the function machine.**

425 → − A → + B → 155

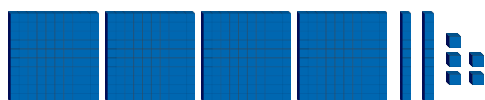- A is a multiple of 100.
- B is a 2-digit multiple of 10.

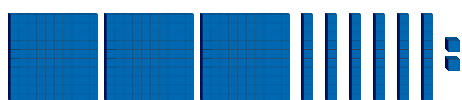**2a. Using the fact 2 + 1 = 3, which is the odd one out? Explain why.**
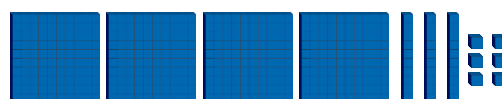
A. 141 + 2

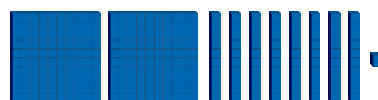B. 425 + 10

C. 362 − 20

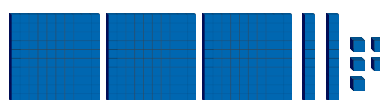**2b. Using the fact 8 − 3 = 5, which is the odd one out? Explain why.**

A. 436 − 5

B. 281 − 30

C. 325 + 3

3a. Alyssa is thinking of a number.

She adds 100.
She subtracts 1.
She adds 20.

She does this twice and this is her answer:

H	T	O

What number did she start with?

3b. Isaac is thinking of a number.

He adds 30.
He subtracts 200.
He adds 3.

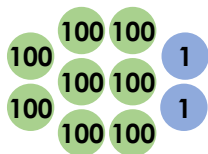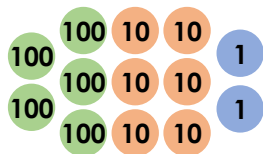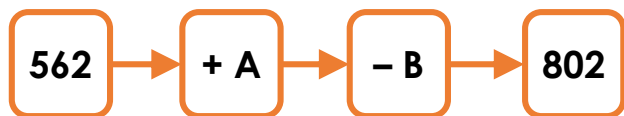He does this twice and this is his answer:

H	T	O

What number did he start with?

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Reasoning and Problem Solving – Pattern Spotting – Year 3 Developing

Pattern Spotting

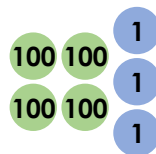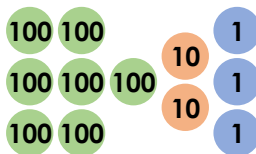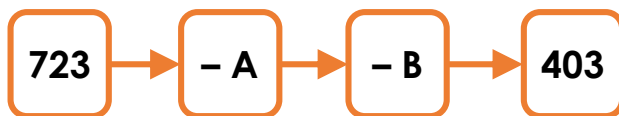**4a. Use the clues to find A and B in the function machine.**

562 → + A → − B → 802

- A is a multiple of one hundred.
- B is a 2-digit multiple of ten.

Pattern Spotting

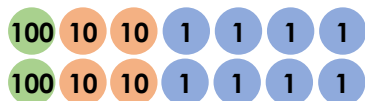**4b. Use the clues to find A and B in the function machine.**

723 → − A → − B → 403

- A is a multiple of one hundred.
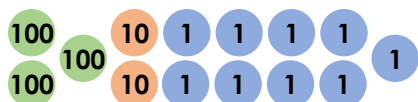- B is a 2-digit multiple of ten.

5a. Using the fact 3 + 5 = 8, which is the odd one out? Explain why.

A.   248   −   30

B.   329   +   500

C.   681   −   30

5b. Using the fact 4 − 2 = 2, which is the odd one out? Explain why.

A.   512   +   2

B.   423   −   200

C.   346   +   20
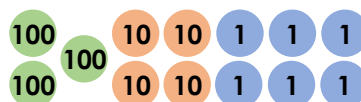
6a. Sarah is thinking of a number.

She adds four hundred.
She subtracts three.
She adds twenty.

She does this twice and this is her answer:

H	T	O
●●● ●●● ●●●	●●● ●●● ●	●●●

What number did she start with?

6b. Brian is thinking of a number.

He adds thirty.
He subtracts two hundred.
He adds nine.

He does this twice and this is his answer:

H	T	O
●	●●●	●●●●

What number did he start with?

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Reasoning and Problem Solving – Pattern Spotting – Year 3 Expected

7a. Use the clues to find A and B in the function machine.

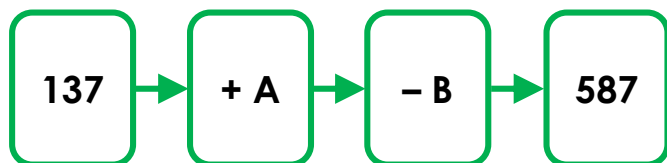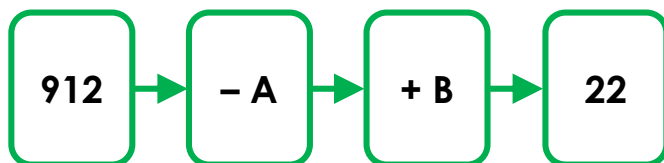| 137 | → | + A | → | − B | → | 587 |

- A is a multiple of one hundred.
- B is a 2-digit multiple of ten.

PS

7b. Use the clues to find A and B in the function machine.

| 912 | → | − A | → | + B | → | 22 |

- A is a multiple of one hundred.
- B is a 2-digit multiple of ten.

PS

8a. Using the fact 7 + 2 = 9, which is the odd one out? Explain why.

A. nine hundred and thirty-four − two hundred

B. two hundred and fifty-seven + twenty

C. four hundred and eighty-two + seven

R

8b. Using the fact 8 − 7 = 1, which is the odd one out? Explain why.

A. one hundred and eighty-nine − ten

B. seven hundred and twenty-three + one hundred

C. six hundred and fifty-nine − seven

R

9a. Raia is thinking of a number.

She adds 300.
She subtracts 8.
She adds 40.

She does this twice and this is her answer:

H	T	O
nine	one	seven

What number did she start with?

PS

9b. Jacob is thinking of a number.

He adds 90.
He subtracts 200.
He adds 4.

He does this twice and this is his answer:

H	T	O
five	one	three

What number did he start with?

PS

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Reasoning and Problem Solving – Pattern Spotting – Year 3 Greater Depth

Reasoning and Problem Solving
Pattern Spotting

Developing

1a. **A = 100; B = 30**
2a. **C because it uses the number fact 6 – 2 = 4**
3a. **58**

Expected

4a. **A = 300; B = 60**
5a. **A because it uses the number fact 4 – 3 = 1**
6a. **139**

Greater Depth

7a. **A = 500; B = 50**
8a. **B because it uses the number fact 5 + 2 = 7**
9a. **253**

Reasoning and Problem Solving
Pattern Spotting

Developing

1b. **A = 300; B = 30**
2b. **A because it uses the number fact 6 – 5 = 1**
3b. **530**

Expected

4b. **A = 300; B = 20**
5b. **C because it uses the number fact 4 + 2 = 6**
6b. **456**

Greater Depth

7b. **A = 900; B = 10**
8b. **C because it uses the number fact 9 – 7 = 2**
9b. **725**

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Reasoning and Problem Solving – Pattern Spotting ANSWERS