Reasoning and Problem Solving
Step 6: Forming Equations

Teaching note:

Concrete manipulatives may be useful for the Developing and Expected levels of this resource.

National Curriculum Objectives:

Mathematics Year 6: (6A1) Express missing number problems algebraically

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Use cards to create an algebraic equation and then create a matching word problem and concrete representation. Using whole numbers no greater than 10.
Expected Use cards to create an algebraic equation and then create a matching word problem. Includes some use of decimals or fractions.
Greater Depth Use cards to create an algebraic equation and then create a matching word problem. Includes decimals and fractions; any operation can be used.

Questions 2, 5 and 8 (Reasoning)
Developing Find and explain which representation is the odd one out. Includes addition and subtraction of whole numbers no greater than 10.
Expected Find and explain which representation is the odd one out. Includes multiplication of whole numbers and some use of fractions or decimals.
Greater Depth Find and explain which representation is the odd one out. Includes all four operations, decimals, fractions and negative numbers.

Questions 3, 6 and 9 (Reasoning)
Developing Identify and explain which word problem does not match a given equation. Using all four operations and whole numbers less than 10.
Expected Identify and explain which word problem does not match a given equation. Using all four operations with some decimals or fractions.
Greater Depth Identify and explain which word problem does not match a given equation. Using all four operations with decimals, negative numbers and fractions.

More Year 6 Algebra resources.

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

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Forming Equations

1a. Use some of the cards to create an algebraic equation.

| 2 | – | 6 | *n* | 8 |

Draw an image using concrete materials and write a word problem to match the equation created.

D

PS

1b. Use some of the cards to create an algebraic equation.

| 2 | 8 | *n* | 4 | – |

Draw an image using concrete materials and write a word problem to match the equation created.

D

PS

2a. Which is the odd one out?

A. I think of a number. I add 4. My answer is 7.

B. + ▢▢▢▢ = ▢▢▢▢▢▢▢
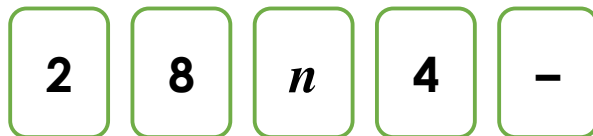
C. $n - 4 = 7$

Explain your answer.

D

R

2b. Which is the odd one out?

A. I think of a number. I add 3. My answer is 5.

B. ● + ■■■■ = ■■■■■

C. $n + 3 = 5$

Explain your answer.

D

R

3a. Chris and Elle are creating word problems based on the equation below.

$$p + 5 = 13$$

Chris: Some people were already at my party. 5 more came. There were 13 people altogether.

Elle: I had 13 posters. My sister took some. Now I have 5 posters.

Who is correct? Explain your answer.

D

R

3b. Toya and Riley are creating word problems based on the equation below.

$$2n = 8$$

Toya: I think of a number. I multiply it by 2 to make 8.
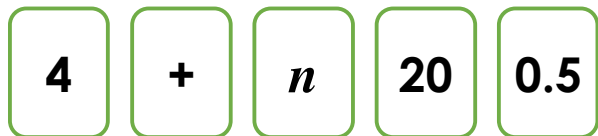
Riley: I think of a number. I divide it by 2 to make 8.

Who is correct? Explain your answer.

D

R

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Reasoning and Problem Solving – Forming Equations – Year 6 Developing

Forming Equations

4a. Use some of the cards to create an algebraic equation.
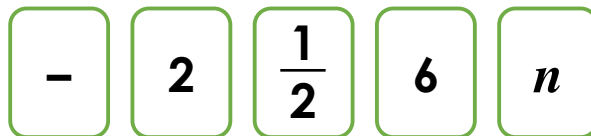
| 4 | + | n | 20 | 0.5 |

Write a word problem to match the equation created.

☆ E

PS

Forming Equations

4b. Use some of the cards to create an algebraic equation.

| − | 2 | $\frac{1}{2}$ | 6 | n |

Write a word problem to match the equation created.

☆ E

PS

5a. Which is the odd one out?

A. I think of a number. I multiply my number by $\frac{1}{2}$. My answer is 6.

B. ● ● ● = ▪ ▪ ▪ ▪ ▪ ▪

C. $3n = 6$

Explain your answer.

☆ E

R

5b. Which is the odd one out?

A. I think of a number. I multiply it by 6. My answer is 12.

B. 🛢🛢🛢🛢 = (12 cubes)

C. $6n = 12$

Explain your answer.

☆ E

R

6a. Eva and Jackson are creating word problems based on the equation below.

$$4r \div 2 = 8$$

Eva: I think of a number. I multiply it by 4 and divide by 2. My answer is 8.

Jackson: I think of a number. I divide it by 4 and divide it again by 2. My answer is 8.

Who is correct? Explain your answer.

☆ E

R

6b. Vansh and Lisa are creating word problems based on the equation below.

$$a - 3.5 = 15.5$$

Vansh: 15.5m of ribbon has been cut off There is 3.5m of ribbon left.

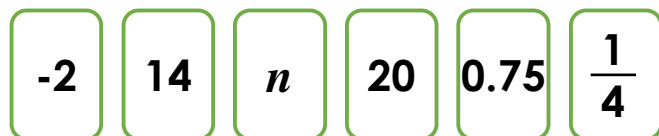Lisa: 3.5m is cut off a piece of ribbon. There is 15.5m of ribbon left.

Who is correct? Explain your answer.

☆ E

R

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Reasoning and Problem Solving – Forming Equations – Year 6 Expected

Forming Equations

Forming Equations

7a. Use some of the cards to create an algebraic equation.

-2	14	n	20	0.75	$\frac{1}{4}$

Write a word problem to match the equation created.

PS

7b. Use some of the cards to create an algebraic equation.

-5	20	n	15	0.5	$\frac{3}{4}$

Write a word problem to match the equation created.

PS

8a. Which is the odd one out?

A. I think of a number. I multiply it by 2.3. I subtract 3. My answer is 10.
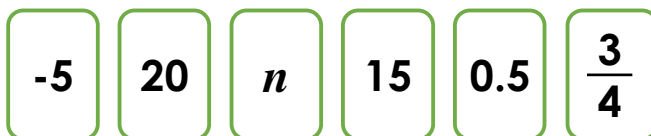
B. + =

C. $2n + 3 = 11$

Explain your answer.

R

8b. Which is the odd one out?

A. I think of a number. I multiply it by 4. I add 2. My answer is 14.

B. + =

C. $-2 + 4n = 16$

Explain your answer.

R

9a. Sophia and Otis are creating word problems based on the equation below.

$$-6 = 0.5d - 22$$

Sophia: My answer is -6. To get this answer, I divided a number by 0.5 and subtracted 22.

Otis: My answer is -6. To get this answer, I multiplied a number by 0.5 and subtracted 22.

Who is correct? Explain your answer.

R

9b. Tom and Jaya are creating word problems based on the equation below.

$$14.75 = 3h - 12.25$$

Tom: I multiplied a number by 3 and added it to 12.25 to get an answer of 14.75.

Jaya: My answer is 14.75. To get this answer, I multiplied a number by 3 and subtracted 12.25.

Who is correct? Explain your answer.

R

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Reasoning and Problem Solving – Forming Equations – Year 6 Greater Depth

Reasoning and Problem Solving
Forming Equations

Developing

1a. Various answers, for example: $n - 2 = 8$. Bessy had some crayons. She gave 2 of them to her friend. She had 8 crayons left.

2a. Option C, as A and B both represent adding 4 to an unknown number. C represents 4 being subtracted from an unknown number.

3a. Chris is correct as his answer shows addition. Elle's equation is $13 - p = 5$.

Developing

1b. Various answers, for example: $2n - 4 = 8$. Sam has 2 bags of cookies. He eats 4. He has 8 cookies left.

2b. Option B, as A and C represent adding 3 to an unknown number to give a total of 5. B represents 4 being added to an unknown number to give a total of 5.

3b. Toya is correct as $2n$ is the same as 2 x n. Riley's equation is $n \div 2 = 8$.

Expected

4a. Various answers, for example: $4n + 0.5 = 20$. Adnan creates 4 fractions using shapes. He adds 0.5. His fractions equal 20.

5a. Option A, as it represents $\frac{1}{2}n = 6$. B and C represent $3n = 6$.

6a. Eva is correct as $4r$ is the same as 4 x r. Jackson has divided r by 4, instead of multiplying.

Expected

4b. Various answers, for example: $\frac{1}{2}n - 2 = 6$. Half of the people at a party have already left. 2 more leave. There are 6 left.

5b. Option B, as it represents $4n = 12$. A and B represent $6n = 12$.

6b. Lisa is correct as her equation shows a subtraction of 3.5. Vansh's equation would be $a - 15.5 = 3.5$.

Greater Depth

7a. Various answers, for example: $0.75n - 14 = -2$. Leon has created an equation. He multiplies an unknown number by 0.75 and subtracts 14. His answer is -2.

8a. Option A, as it represents $2.3n - 3 = 10$. B and C both represent $2n + 3 = 11$.

9a. Otis is correct as $0.5d$ is the same as 0.5 x d. Sophia's equation would be $-6 = d \div 0.5 - 22$.

Greater Depth

7b. Various answers, for example: $0.5n - 20 = -5$. Sonya has created an equation. She multiplies an unknown number by 0.5 and subtracts 20. Her answer is -5.

8b. Option C, as A and B both represent $4n + 2 = 14$.

9b. Jaya is correct because she has subtracted 12.25. Tom's equation would be $3h + 12.25 = 14.75$.