Reasoning and Problem Solving
Step 11: Prime Numbers

National Curriculum Objectives:

Mathematics Year 6: (6C5) Identify common factors, common multiples and prime numbers

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Explain whether a statement involving the sum of two prime numbers, no greater than 100, is correct.
Expected Explain whether a statement involving the sum of two pairs of prime numbers, no greater than 100, is correct.
Greater Depth Explain whether a statement involving the sum of prime factors for two given numbers is correct.

Questions 2, 5 and 8 (Problem Solving)
Developing Combine the digit cards to make prime numbers no greater than 100.
Expected Combine the digit cards provided to create two prime numbers, no greater than 100, to make a given number.
Greater Depth Combine the digit cards provided to create three prime numbers, no greater than 100, to make number within a given range.

Questions 3, 6 and 9 (Reasoning)
Developing Explain which of two statements regarding the position of prime numbers, no greater than 100, is correct.
Expected Explain which of two statements regarding the sum of prime numbers, no greater than 100, is correct.
Greater Depth Explain which of two statements regarding the prime factors of a given number is correct.

More Year 6 Four Operations resources.

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Prime Numbers

1a. Maya says,

The sum of the 3rd and 5th prime number is greater than 20.

Is she correct? Explain why.

D

PS

Prime Numbers

1b. Ted says,

The sum of the 9th and 11th prime number is less than 50.

Is he correct? Explain why.

D

PS

2a. Make all of the possible prime numbers using the digits cards below.

2	6
5	3

D

PS

2b. Make all of the possible prime numbers using the digits cards below.

4	1
7	9

D

PS

3a. Whose statement is correct?

Tyrell

The prime number after 23 has a digit sum of 11.

The prime number after 23 has a digit sum of 9.

Beth

Explain why.

D

R

3b. Whose statement is correct?

Isaac

The prime number before 83 has a digit sum of 15.

The prime number before 83 has a digit sum of 16.

Lottie

Explain why.

D

R

Prime Numbers

4a. Asha says,

The sum of the 9th and 11th prime number is greater than the sum of the 8th and 10th.

Is she correct? Explain why.

E

PS

Prime Numbers

4b. Greg says,

The sum of the 15th and 16th prime number is less than the sum of the 14th and 17th.

Is he correct? Explain why.

E

PS

5a. Make 2 prime numbers up to 100 using the digit cards below whose total is 94.

1 5 3 9 4

E

PS

5b. Make 2 prime numbers up to 100 using the digit cards below whose total is 100.

7 2 9 1 6

E

PS

6a. Whose statement is correct?

Tim

The sum of two prime numbers equals 32.

The sum of two prime numbers equals 55.

Zara

Explain why.

E

R

6b. Whose statement is correct?

Eddie

The sum of two prime numbers equals 80.

The sum of two prime numbers equals 74.

Lois

Explain why.

E

R

Prime Numbers

7a. Niamh says,

The sum of the prime factors for 25 is greater than the sum of the prime factors for 20.

Is she correct? Explain why.

GD PS

Prime Numbers

7b. Ahmed says,

The sum of the prime factors for 15 is less than the sum of the prime factors for 18.

Is he correct? Explain why.

GD PS

8a. Using the digit cards below, create three 2-digit prime numbers whose total is greater than 40 but less than 50.

1	2	3	7	9

Find a second solution.

GD PS

8b. Using the digit cards below, create three 2-digit prime numbers whose total is greater than 100 but less than 110.

1	2	3	4	7

Find a second solution.

GD PS

9a. Whose statement is correct?

Owen

The prime factors of 44 are 2 and 11.

The prime factors of 44 are 4 and 11.

Erin

Explain why.

GD R

9b. Whose statement is correct?

Jenson

The prime factors of 36 are 3 and 12.

The prime factors of 36 are 2 and 3.

Jessica

Explain why.

GD R

Reasoning and Problem Solving
Prime Numbers

Developing

1a. She is not correct because, 3rd = 5, 5th = 11 and 5 + 11 = 16.

2a. 2, 3, 5, 23, 53

3a. Tyrell is correct. 29 comes after 23 and 2 + 9 = 11.

Expected

4a. Asha is correct because, 9th = 23, 11th = 31 and 23 + 31 = 54; 8th = 19, 10th = 29 and 19 + 29 = 48. 54 is greater than 48.

5a. 53 + 41 = 94

6a. Tim is correct because 29 + 3. Zara is also correct because 53 + 2 = 55.

Greater Depth

7a. She is incorrect because the prime factorisation for 25 is 5 x 5 (5 + 5 = 10) and the prime factorisation for 20 is 2 x 2 x 5 (2 + 2 + 5 = 9).

8a. 13 + 23 + 11 = 47 or 17 + 19 + 11 = 47

9a. Owen is correct because the prime factorization for 44 is 2 x 2 x 11.

Reasoning and Problem Solving
Prime Numbers

Developing

1b. He is not correct because, 9th = 23, 11th = 31 and 23 + 31 = 54.

2b. 7, 17, 19, 41, 47, 71, 79, 97

3b. Lottie is correct. 79 comes before 83 and 7 + 9 = 16

Expected

4b. Greg is correct because, 15th = 47, 16th = 53 and 47 + 53 = 100; 14th = 43, 17th = 59 and 43 + 59 = 102. 100 is less than 102.

5b. 71 + 29 = 100

6b. Eddie is correct because 61 + 19 = 80. Lois is also correct because 3 + 71 = 74.

Greater Depth

7b. He is incorrect because the prime factorization for 15 is 5 x 3 (5 + 3 = 8) and the prime factorization for 18 is 2 x 3 x 3 (2 + 3 + 3 = 8).

8b. 23 + 43 + 41 = 107 or 11 + 23 + 73 = 107

9b. Jessica is correct because the prime factorization for 36 is 2 x 2 x 3 x 3.