# Reasoning and Problem Solving Step 6: Cube Numbers

# National Curriculum Objectives:

Mathematics Year 5: (5C5d) <u>Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)</u>

## **Differentiation:**

Questions 1, 4 and 7 (Reasoning)

Developing Find and explain the odd one out. Includes the first 5 cube numbers. Expected Find and explain the odd one out. Includes the first 12 cube numbers. Greater Depth Find and explain the odd one out. Includes the first 12 cube numbers and applying knowledge of square numbers.

### Questions 2, 5 and 8 (Reasoning)

Developing Prove if a given number is a cube number. Includes the first 5 cube numbers. Expected Prove if a given number is a cube number. Includes the first 12 cube numbers. Greater Depth Prove if the answer to a given calculation is a cube number. Includes the first 12 cube numbers and applying knowledge of square numbers.

### Questions 3, 6 and 9 (Problem Solving)

**Developing** Solve a word problem using knowledge and understanding of cube numbers. Includes the first 5 cube numbers.

Expected Solve a word problem using knowledge and understanding of cube numbers. Includes the first 12 cube numbers.

Greater Depth Solve a word problem using knowledge and understanding of cube and square numbers. Includes the first 12 cube numbers and square numbers.

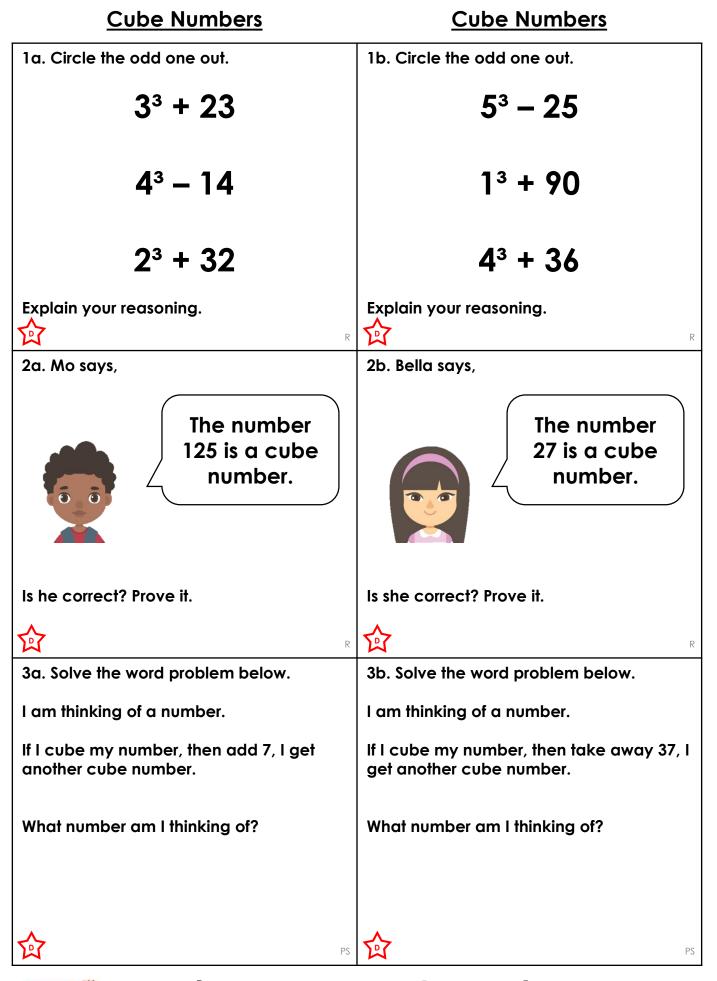
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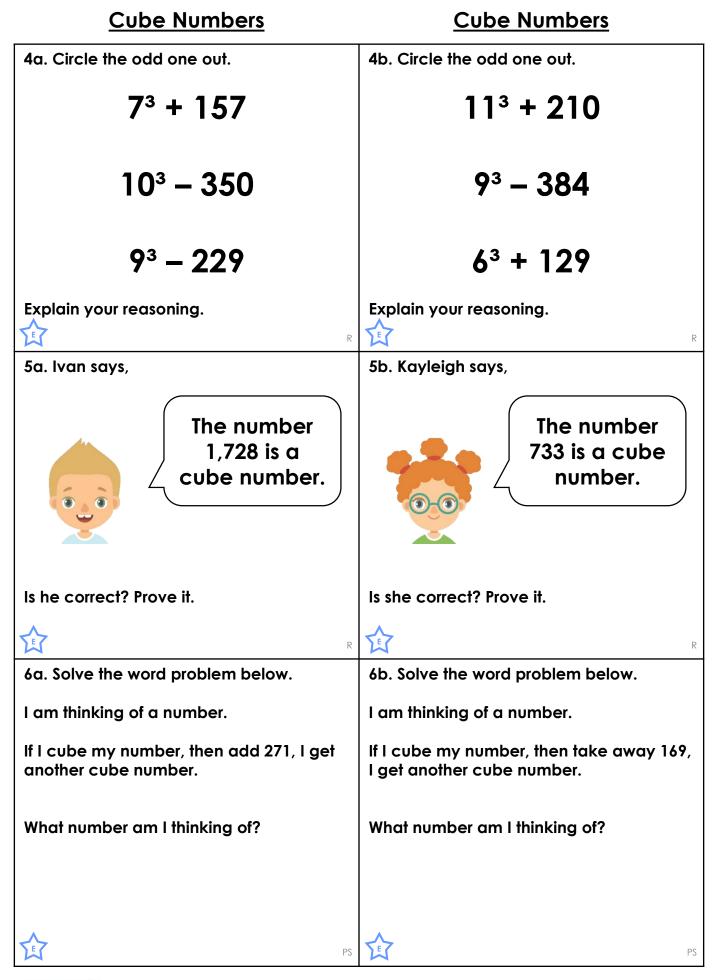
Reasoning and Problem Solving – Cube Numbers – Teaching Information



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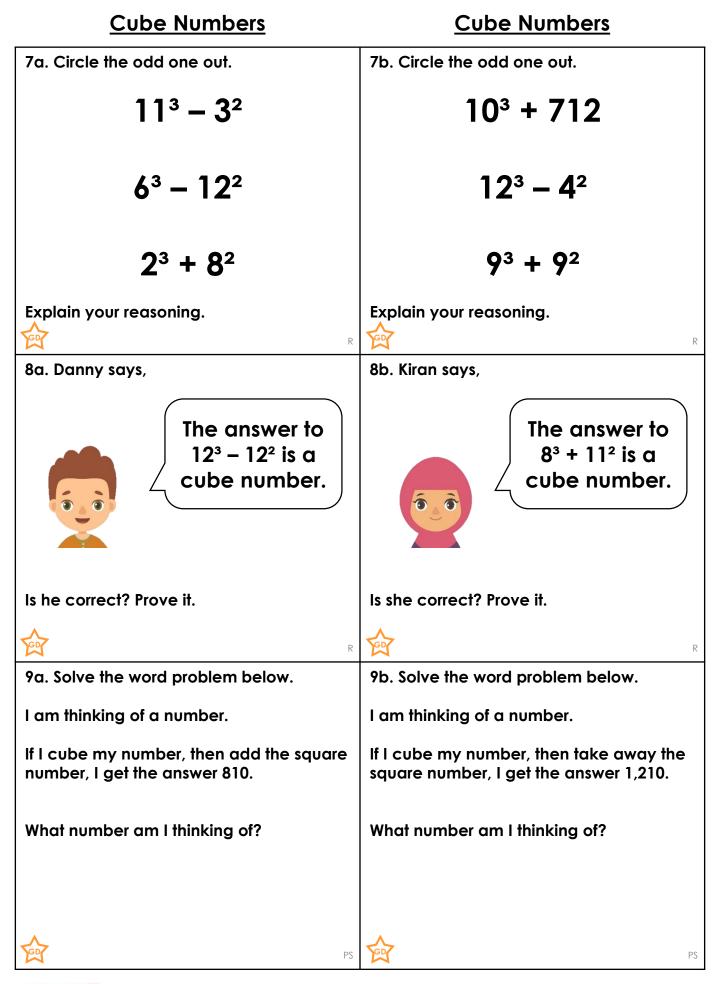
Reasoning and Problem Solving – Cube Numbers – Year 5 Developing





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Reasoning and Problem Solving – Cube Numbers – Year 5 Expected





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Reasoning and Problem Solving – Cube Numbers – Year 5 Greater Depth

### <u>Reasoning and Problem Solving</u> <u>Cube Numbers</u>

#### Developing

1a. 2<sup>3</sup> + 32 is the odd one out because the answer is 40. The answer to the other calculations is 50.

2a. Mo is correct because when the number 5 is multiplied by itself and then by itself again, the product is 125.3a. 1

#### **Expected**

4a.  $10^3 - 350$  is the odd one out because the answer is 650. The answer to the other calculations is 500.

5a. Ivan is correct because when the number 12 is multiplied by itself and then by itself again, the product is 1,728.6a. 9

#### Greater Depth

7a.  $11^3 - 3^2$  is the odd one out because the answer is 1,322. The answer to the other calculations is 72.

8a. Danny is not correct because  $12^3 - 12^2 = 1,584$  and no whole number can be multiplied by itself and then by itself again to reach the product 1,584. The cube number of 11 is 1,331 and the cube number of 12 is 1,728. 9a. 9

### <u>Reasoning and Problem Solving</u> <u>Cube Numbers</u>

#### Developing

1b. 1<sup>3</sup> + 90 is the odd one out because the answer is 91. The answer to the other calculations is 100.

2b. Bella is correct because when the number 3 is multiplied by itself and then by itself again, the product is 27. 3b. 4

#### **Expected**

4b. 11<sup>3</sup> + 210 is the odd one out because the answer is 1,541. The answer to the other calculations is 345.

5b. Kayleigh is not correct because no whole number can be multiplied by itself and then by itself again to reach the product 733. The cube number of 9 is 729 and the cube number of 10 is 1,000. 6b. 8

#### Greater Depth

7b.  $9^3 + 9^2$  is the odd one out because the answer is 810. The answer to the other calculations is 1,712.

8b. Kiran is not correct because  $8^3 + 11^2 = 633$  and no whole number can be multiplied by itself and then by itself again to reach the product 633. The cube number of 8 is 512 and the cube number of 9 is 729.

9b. 11



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