

# Varied Fluency

## Step 12: Square and Cube Numbers

### National Curriculum Objectives:

Mathematics Year 5: (5C5d) [Recognise and use square numbers and cube numbers, and the notation for squared \(2\) and cubed \(3\)](#)

Mathematics Year 5: (5C8a) [Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes](#)

### Differentiation:

**Developing** Questions to support recognising, ordering and calculating square numbers up to  $12^2$  and cube numbers up to  $5^3$ . All questions to include the index and the corresponding multiplication, i.e.  $4^3 = 4 \times 4 \times 4$ .

**Expected** Questions to support recognising, ordering and calculating square numbers up to  $12^2$  and cube numbers up to  $12^3$ .

**Greater Depth** Questions to support recognising, ordering and calculating square numbers up to  $12^2$  and cube numbers up to  $12^3$ . Questions presented using square and cube numbers within a calculation involving all four operations. Also using knowledge of square and cubed numbers to calculate the square and cube root.

More [Year 6 Four Operations](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

## Square and Cube Numbers

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1a. Circle the square numbers and underline the cube numbers.

$4 \times 4 \times 4 = 64$

$11 \times 11 = 121$

$2 \times 2 = 4$

$6 \times 2 = 12$

$4 \times 5 = 20$

$5 \times 5 \times 5 = 125$



VF

1b. Circle the square numbers and underline the cube numbers.

$3 \times 3 \times 3 = 27$

$10 \times 10 = 100$

$5 \times 2 = 10$

$8 \times 8 = 64$

$4 \times 3 = 12$

$2 \times 2 \times 2 = 8$



VF

2a. Complete the calculations.

$7^2 = 7 \times 7 = \square$

$3^3 = 3 \times 3 \times 3 = \square$

$10^2 = 10 \times 10 = \square$



VF

2b. Complete the calculations.

$9^2 = 9 \times 9 = \square$

$5^3 = 5 \times 5 \times 5 = \square$

$12^2 = 12 \times 12 = \square$



VF

3a. Calculate then order from smallest to largest.

$6^2 = 6 \times 6$

$2^3 = 2 \times 2 \times 2$

$12^2 = 12 \times 12$

$9^2 = 9 \times 9$



VF

3b. Calculate then order from largest to smallest.

$11^2 = 11 \times 11$

$3^2 = 3 \times 3$

$4^3 = 4 \times 4 \times 4$

$7^2 = 7 \times 7$



VF

4a. Find the pattern. What is the missing number in the sequence?

$1^3 = 1 \times 1 \times 1 = 1$

$2^3 = 2 \times 2 \times 2 = 8$

$3^3 = 3 \times 3 \times 3 = 27$



VF

4b. Find the pattern. What are the missing numbers in the sequence?

$2^2 = 2 \times 2 = 4$

$4^2 = 4 \times 4 = 16$

$6^2 = 6 \times 6 = 36$



VF

## Square and Cube Numbers

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5a. Circle the square numbers and underline the cube numbers.

8      16      512      121

15      10      81      5

100      60      27      1,000



VF

5b. Circle the square numbers and underline the cube numbers.

49      30      125      18

144      12      1,331      70

216      729      4      25



VF

6a. Complete the calculations.

$$8^2 = \square$$

$$6^3 = \square$$

$$12^2 = \square$$



VF

6b. Complete the calculations.

$$4^3 = \square$$

$$11^2 = \square$$

$$5^3 = \square$$



VF

7a. Calculate then order from smallest to largest.

$7^2$

$5^3$

$11^3$

$3^3$

$6^2$



VF

7b. Calculate then order from largest to smallest.

$4^2$

$8^3$

$12^3$

$7^3$

$9^2$



VF

8a. Find the pattern. What are the missing numbers in the sequence?

1,728,    1,000,    512,     $\square$  ,     $\square$



VF

8b. Find the pattern. What are the missing numbers in the sequence?

16,    36,    64,     $\square$  ,     $\square$



VF

## Square and Cube Numbers

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9a. Circle the calculations which are correct.

$$8^2 \div 2^3 = 8$$

$$3^3 \times 10^2 = 270$$

$$\text{cube root of } 512 = 7$$

$$5^3 + 50 = 175$$

$$3^3 + 73 = 100$$



VF

9b. Circle the calculations which are correct.

$$9^2 \times 10^3 = 810$$

$$12^3 - 728 = 10^3$$

$$\text{cube root of } 1,331 = 12$$

$$7^3 + 8^2 = 407$$

$$2^3 \times 5^2 = 33$$



VF

10a. Complete the calculations.

$$7^2 + 6^3 = \square$$

$$12^3 - 10^3 = \square$$

$$\text{square root of } 121 = \square$$



VF

10b. Complete the calculations.

$$4^3 \times 2 = \square$$

$$12^3 + 272 = \square$$

$$\text{square root of } 144 = \square$$



VF

11a. Calculate then order from smallest to largest.

$$10^3 + 12^3$$

$$8^2 + 4^3$$

$$11^2 - \text{cube root of } 729$$

$$3^2 \times 2^3$$

$$6^3 \div 2$$



VF

11b. Calculate then order from largest to smallest.

$$5^3 + 4^2$$

$$8^3 - 3^2$$

$$10^3 \times \text{cube root of } 729$$

$$4^3 \div 2^3$$

$$6^3 + 34$$



VF

12a. Find the pattern. What is the missing number in the sequence?

square root of 144

square root of 100

square root of 64



VF

12b. Find the pattern. What is the missing number in the sequence?

cube root of 8

cube root of 64

cube root of 216



VF

**Varied Fluency**  
**Square and Cube Numbers**

**Developing**

- 1a. Circle –  $11 \times 11 = 121$ ,  $2 \times 2 = 4$ ;  
Underline –  $4 \times 4 \times 4 = 64$ ,  $5 \times 5 \times 5 = 125$   
2a. 49, 27, 100  
3a.  $2^3 = 2 \times 2 \times 2 = 8$ ,  $6^2 = 6 \times 6 = 36$ ,  $9^2 = 9 \times 9 = 81$ ,  $12^2 = 12 \times 12 = 144$   
4a.  $4^3 = 4 \times 4 \times 4 = 64$

**Expected**

- 5a. Circle – 16, 121, 81, 100; Underline – 8, 512, 27, 1,000  
6a. 64, 216, 144  
7a.  $3^3 = 27$ ,  $6^2 = 36$ ,  $7^2 = 49$ ,  $5^3 = 125$ ,  $11^3 = 1,331$   
8a. 216, 64

**Greater Depth**

- 9a.  $8^2 \div 2^3 = 8$ ,  $3^3 \times 10^2 = 270$ ,  $5^3 + 50 = 175$ ,  $3^3 + 73 = 100$   
10a. 265, 728, 11  
11a.  $3^2 \times 2^3 = 72$ ,  $6^3 \div 2 = 108$ ,  $11^2$  – cube root of 729 = 112,  $8^2 + 4^3 = 128$ ,  $10^3 + 12^3 = 2,728$   
12a. square root of 36

**Varied Fluency**  
**Square and Cube Numbers**

**Developing**

- 1b. Circle –  $10 \times 10 = 100$ ,  $8 \times 8 = 64$ ;  
Underline –  $3 \times 3 \times 3 = 27$ ,  $2 \times 2 \times 2 = 8$   
2b. 81, 125, 144  
3b.  $11^2 = 11 \times 11 = 121$ ,  $4^3 = 4 \times 4 \times 4 = 64$ ,  $7^2 = 7 \times 7 = 49$ ,  $3^2 = 3 \times 3 = 9$   
4b.  $8^2 = 8 \times 8 = 64$

**Expected**

- 5b. Circle – 49, 144, 4, 25; Underline – 125, 1,331, 729, 216  
6b. 64, 121, 125  
7b.  $12^3 = 1,728$ ,  $8^3 = 512$ ,  $7^3 = 343$ ,  $9^2 = 81$ ,  $4^2 = 16$   
8b. 100, 144

**Greater Depth**

- 9b.  $12^3 - 728 = 10^3$ ,  $7^3 + 8^2 = 407$ ,  $2^3 \times 5^2 = 33$   
10b. 128, 2,000, 12  
11b.  $10^3 \times$  cube root of 729 = 9,000,  $8^3 - 3^2 = 503$ ,  $6^3 + 34 = 250$ ,  $5^3 + 4^2 = 141$ ,  $4^3 \div 2^3 = 8$   
12b. cube root of 512