

Discussion Problems

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](#)

About this resource:

This resource has been designed for pupils who understand the concepts within [this step](#). It provides pupils with more opportunities to enhance their reasoning and problem solving skills through more challenging problems. Pupils can work in pairs or small groups to discuss with each other about how best to tackle the problem, as there is often more than one answer or more than one way to work through the problem.

There may be various answers for each problem. Where this is the case, we have provided one example answer to guide discussion.

We recommend self or peer marking using the answer page provided to promote discussion and self-correction.

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

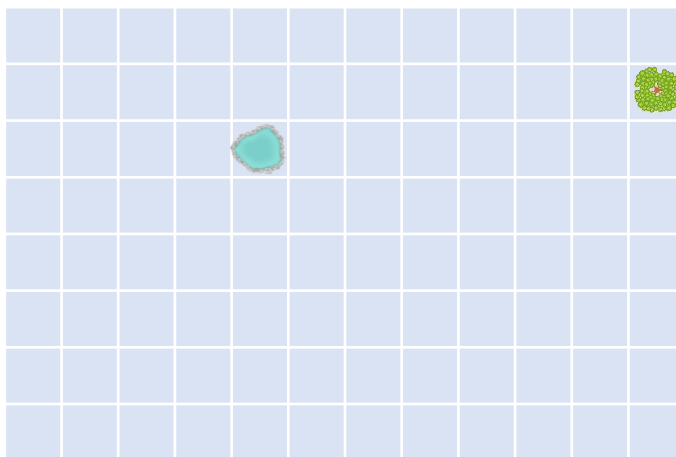
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Square and Cube Numbers

1. Howard is planning to build some items for a model village museum. He is using cubes to map out his plan. Below is the blueprint of the plot he's allowed to build on. He cannot build on trees or ponds and each item needs to be connected by a road. How can he arrange the buildings? Add the roads to the blueprint.

1 square = 1 cm²

Not drawn to scale



Post box

Telephone box

House

Café

Church



A = 1cm³



B = 8cm³



C = 27cm³



D = 64cm³



E = 216cm³

DP

2. Use the number cards to make each number sentence correct. You may use each number card as many times as you like.

$$1^2$$

$$9^2$$

$$4^2$$

$$10^2$$

$$3^2$$

$$5^2$$

$$\square + \square + \square = 3^3$$

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

$$\square + \square + \square = 5^3$$

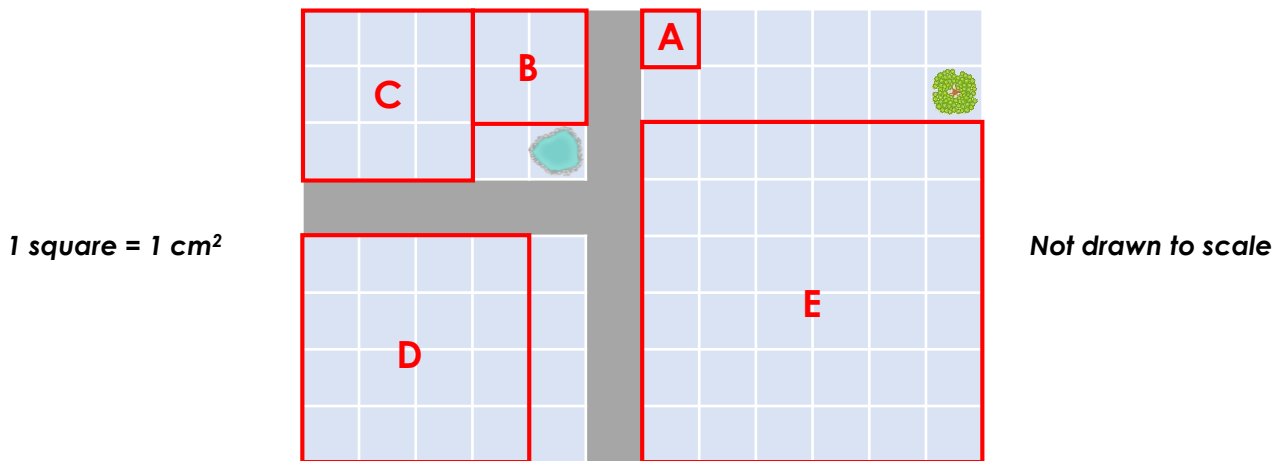
$$\square + \square + \square + \square = 7^3$$

DP

Square and Cube Numbers

1. Howard is planning to build some items for a model village museum. He is using cubes to map out his plan. Below is the blueprint of the plot he's allowed to build on. He cannot build on trees or ponds and each item needs to be connected by a road. How can he arrange the buildings? Add the roads to the blueprint.

Various answers, for example:



1 square = 1 cm²

Not drawn to scale

Post box

Telephone box

House

Café

Church



$$A = 1\text{cm}^3$$

$$A = (1^3)\text{cm}^3$$

$$B = 8\text{cm}^3$$

$$B = (2^3)\text{cm}^3$$

$$C = 27\text{cm}^3$$

$$C = (3^3)\text{m}^3$$

$$D = 64\text{cm}^3$$

$$D = (4^3)\text{cm}^3$$

$$E = 216\text{cm}^3$$

$$E = (6^3)\text{cm}^3$$

2. Use the number cards to make each number sentence correct. You may use each number card as many times as you like.

$$1^2$$

$$9^2$$

$$4^2$$

$$10^2$$

$$3^2$$

$$5^2$$

$$5^2 + 1^2 + 1^2 = 3^3$$

$$10^2 + 10^2 + 4^2 = 6^3$$

$$10^2 + 4^2 + 3^2 = 5^3$$

$$9^2 + 9^2 + 9^2 + 10^2 = 7^3$$

DP