











Multiplication and Division: Cube Numbers

Aim: Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3). To find cube numbers.	Success Criteria: I can create cubes using interlocking cubes. I can write calculations to make cube numbers. I can use the 3 notation correctly.	Resources: Lesson Pack Interlocking cubes Sorting hoops
	Key/New Words: Cube numbers, calculation, dimensions, notation, height, width, length, depth, multiply.	Preparation: Differentiated Cube Numbers Activity Sheets – one per child Diving into Mastery Activity Sheets – as required Cube Number Posters – as required

Prior Learning: It would be helpful if children are familiar with [Square Numbers](#), the notation and how to calculate them as they can apply this knowledge when cubing numbers.

Learning Sequence

	Remember It: Using the corresponding slide on the Lesson Presentation , the children will complete fluency questions revising square numbers. There is a further challenge available where children will generate as many mathematical statements as they can for the following statement: '36 is the answer. What could be the question?' Can the children apply their prior learning when answering the fluency questions?	
	Let's Build: Using the corresponding slide of the Lesson Presentation , the children will be presented with an image of five interlocking cubes. They will consider the question: 'Is it possible to connect these together to build a complete cube?' The children will then be given time to explore if it is possible. To generate beneficial maths discussion, children could carry this out with a partner. Can the children create cubes using interlocking cubes? Using the following two corresponding slides of the Lesson Presentation , the children will share if they were able to create a complete cube using the five interlocking cubes. There are images of the models that prove that you cannot create a complete cube from the number of cubes given. The children will then consider how many more cubes they need in order to create a complete cube. They can then continue working alongside a partner to solve this. The next slide presents an image of a complete cube made from eight interlocking cubes. The children may share that they needed an extra three interlocking cubes to build this. The question: 'What do you notice about the dimensions of the cube?' will then be discussed as a whole class. Can the children notice that the dimensions of a complete cube are the same (width, length and height)?	
	8 Is a Cube Number: Using the following corresponding slide of the Lesson Presentation , the children will discuss the image of the complete cube. The whole class discussion will focus on drawing out the dimensions of the cube and counting the number of cubes that have created the image. This will enable children to conclude that eight is a cube number as it took a total of eight cubes to build the complete cube.	
	Exploring Cube Numbers: Using the corresponding slide of the Lesson Presentation , the children will use interlocking cubes to find cube numbers other than eight. They will be encouraged to present their findings in the form of a table. By showing their findings in this way, they will be able to draw out the dimensions of a cube and work out the cube numbers. During this time, adults can assess children's capabilities of building complete cubes and presenting their findings. Can the children create cubes using interlocking cubes? Can the children present their findings clearly using the table?	
	Writing Calculations for Cube Numbers: Using the three corresponding slides of the Lesson Presentation , the children will engage in a whole-class discussion on writing calculations when cubing a number. The images on the slide will enable children to see where the numbers in the calculation come from. There are three examples for the whole class to discuss. Can the children write calculations for cube numbers?	
	Cubing a Number: Using the two corresponding slides of the Lesson Presentation , the children will recap how to square a number and the 2 notation used in recordings. The class will then use this knowledge to look at cubing a number and using the 3 notation. It is essential here that children grasp that the 3 notation tells us to multiply a number by itself three times. By doing this, the product is always going to be a cube number. Can the children use the 3 notation correctly?	

	<p>Cube Numbers: The children work independently to complete the differentiated Cube Numbers Activity Sheets. Children can have access to the Cube Number Posters for extra support.</p> <div style="display: flex; justify-content: space-between;"> <div data-bbox="244 192 592 712">  <p>To support children working towards expected level, the children will engage in an adult-led group task. They will discuss images of cube numbers and non-cube numbers and articulate their thoughts when an adult reads the question prompts. Children can further sort the images into sorting hoops to demonstrate the differences between cube and non-cube numbers.</p> </div> <div data-bbox="624 192 971 573">  <p>Children working at expected level will complete an information table with cube number calculations and answers. They will then compare statements using $<$, $>$ or $=$. They will further look at an image of an incomplete cube and answer questions related to this.</p> </div> <div data-bbox="1003 192 1351 741">  <p>To challenge children working at greater depth, they will complete an information table with cube number calculations and answers. Following this, they will sort numbers on to a Venn diagram based on their properties. These children will have an opportunity to complete more challenging calculations involving cubing and will give a written response to a reasoning question.</p> </div> </div>	
	<p>Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity. These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.</p> <div style="margin-top: 10px;">  <p>Children complete fluency questions related to recognising cube numbers, carrying out calculations and matching cube numbers to their calculations.</p> </div> <div style="margin-top: 10px;">  <p>Children answer reasoning questions related to finding the odd one out, giving a response to a statement and sharing if they believe a child has used the correct method.</p> </div> <div style="margin-top: 10px;">  <p>Children work individually or collaboratively on problem-solving questions related to finding a number based on certain clues, finding the value of the unknown and finding the sum of a square and a cube number that gives the answer of 252.</p> </div>	

Exploreit

Learnit: Children will find this year 5 [Knowledge Organiser](#) a useful tool to support their multiplication and division understanding.

Buildit: Children will benefit from further opportunities to use interlocking cubes to build cube numbers.