1)

8	<	125	<	216
27	<	64	>	1
512	>	343	>	125
729	>	64	=	64
216	<	729	<	1000

1) a) The numbers 111, 216, 16, 27, 343, 18 and 64 should be circled.
Carroll diagram correctly completed:

	Odd	Even
Cube Number	343, 27	512, 64, 216
Not a Cube Number	111	36, 12, 16, 18

b) The statement is true. When you multiply any odd number by another odd number, the result will be odd. When you multiply any number by an even number, the result will be even.

2) This is sometimes true. If a number ends in 0, 1,4, 5 and 6, the last digit of its cube is the same as the original number's. However, if a number does not end in one of these digits, the last digit of its cube is as follows:

- number ending with 2: the last digit of its cube is 8;
- number ending with 8: the last digit of its cube is 2;
- number ending with 3: the last digit of its cube is 7;
- number ending with 7: the last digit of its cube is 3.

1)

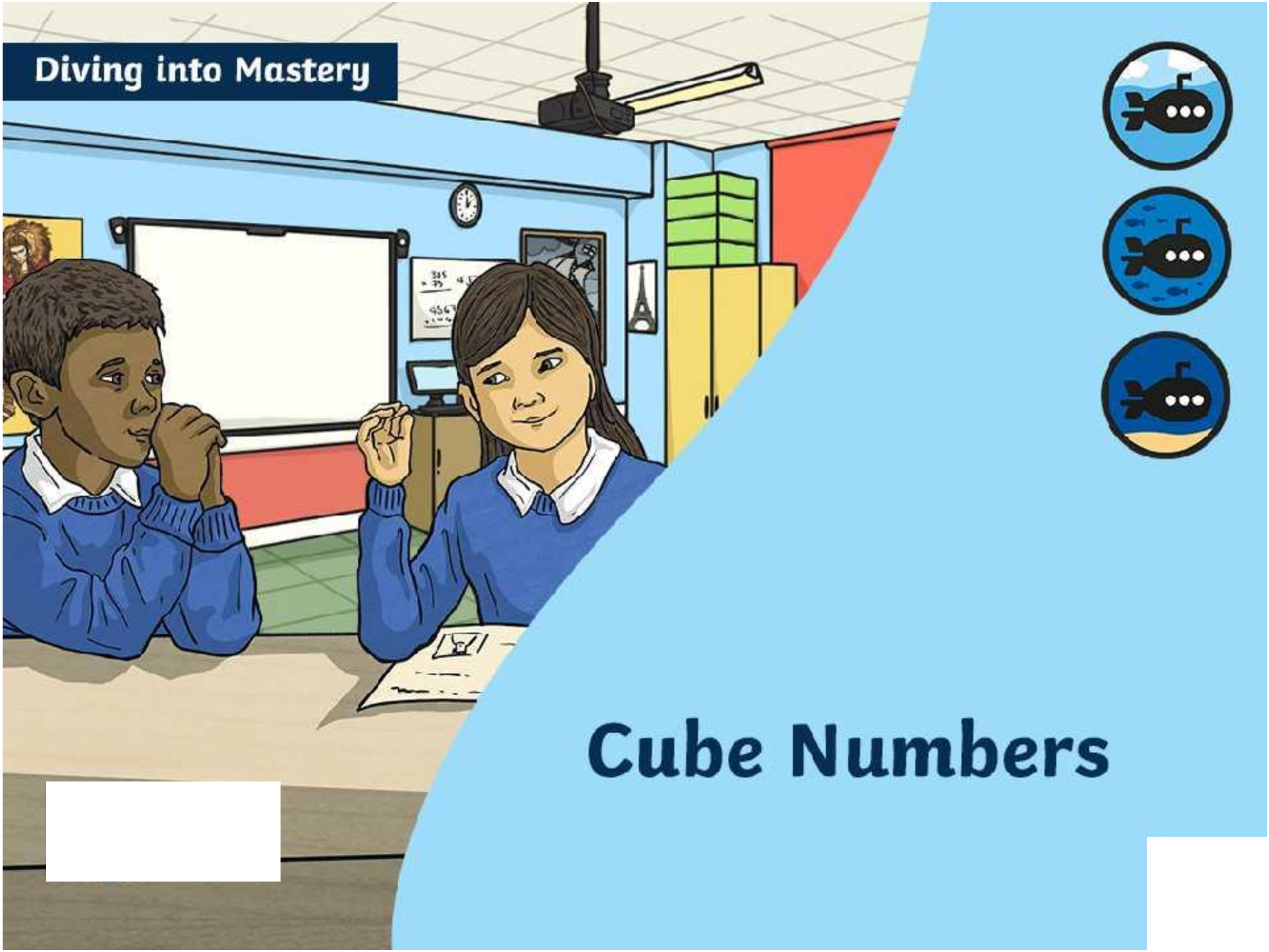
8	64	27	216	125

2) $3^3 + 4^3 + 5^3 = 6^3$

$27 + 64 + 125 = 216$

3) $8^3 + 6^3 + 1^3 = 9^3$

$512 + 216 + 1 = 729$


Diving into Mastery
Cube Numbers

Diving into Mastery Guidance for Educators

Each activity sheet is split into three sections, diving, deeper and deepest, which are represented by the following icons:

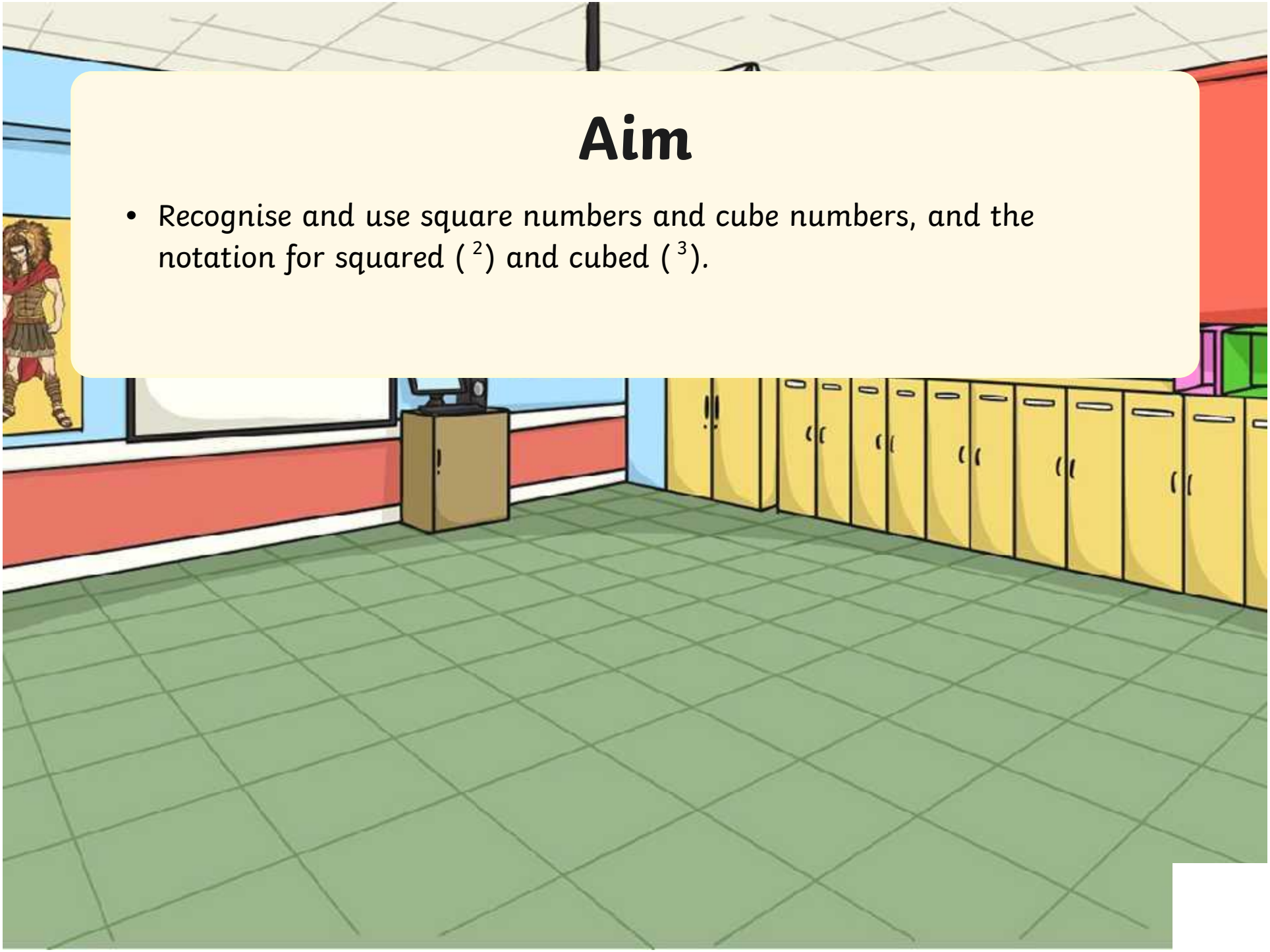
Diving

Deeper

Deepest

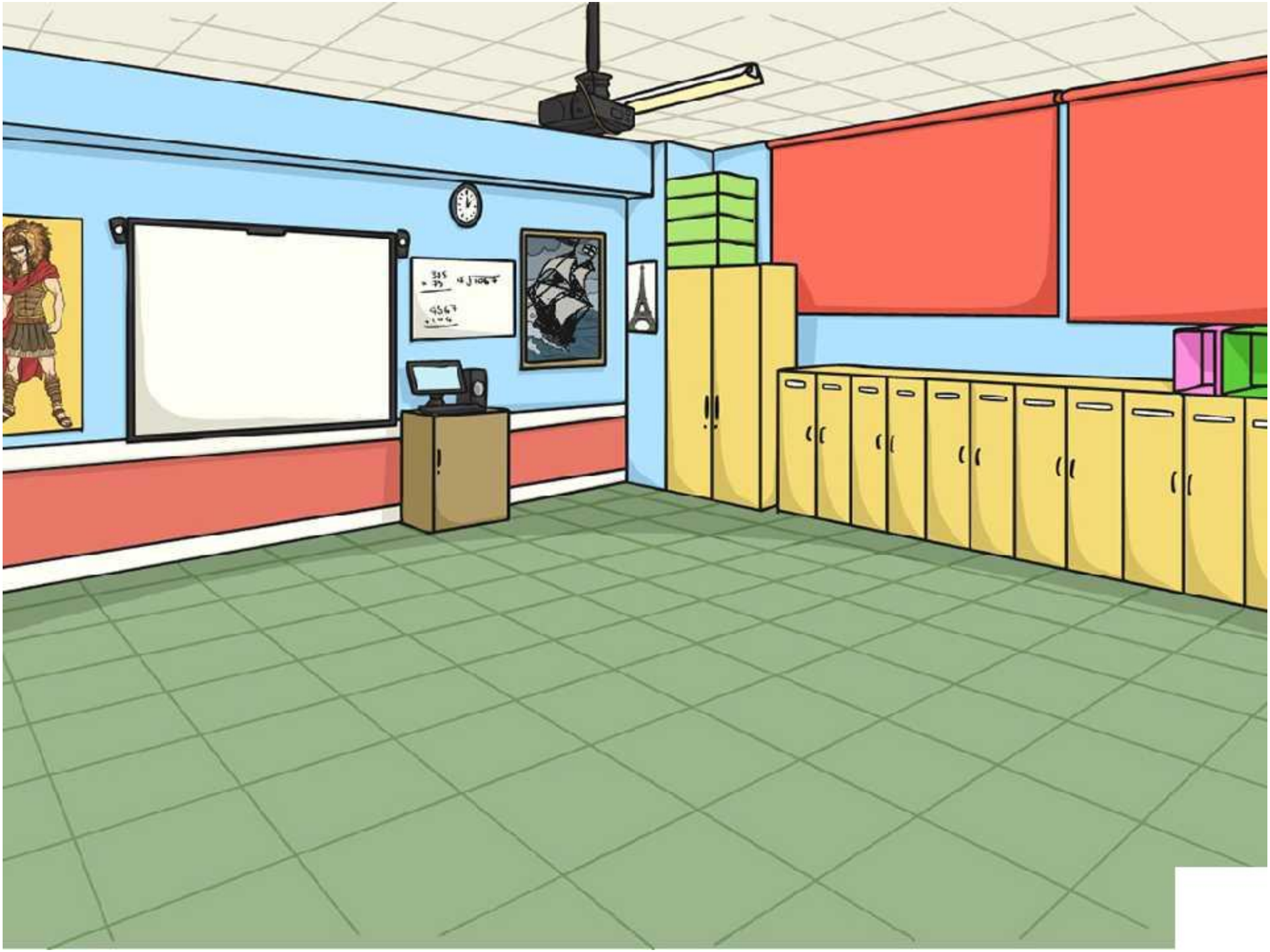
These carefully designed activities take your children through a learning journey, initially ensuring they are fluent with the key concept being taught; then applying this to a range of reasoning and problem-solving activities.

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.



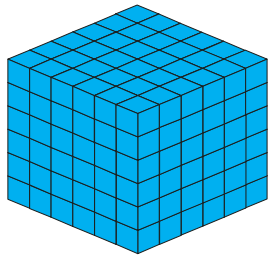
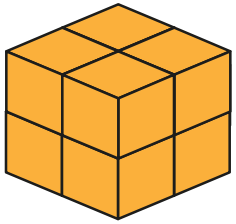
Aim

- Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).



Cube Numbers | **Diving**

Complete the table by giving the cube numbers shown by each representation. In the blank boxes, use the <, > and = symbols to compare the numbers.

6^3 216	=	 216	<	9^3 729
 8	<	8^3 512	<	$10 \times 10 \times 10$ 1000

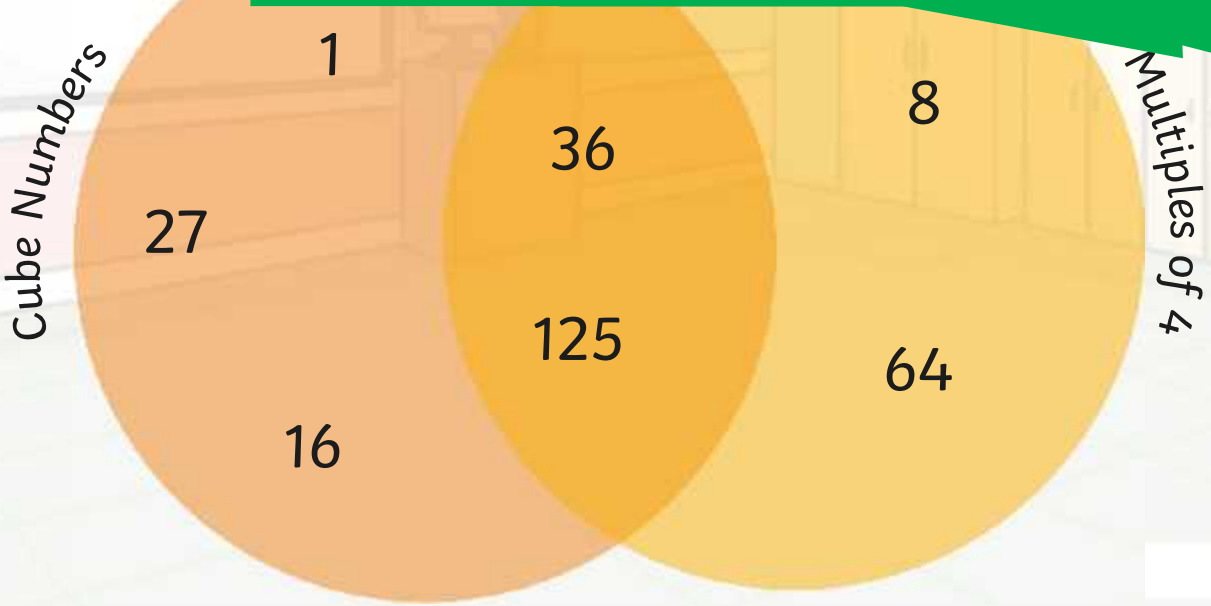
Cube Numbers | **Deeper**

Are these statements true or false? [illegible] into this Venn diagram.

My Venn diagram contains a number which is both a square number and a cube number.

False. Numbers will[illegible] of cube number or n[illegible] on the diagram but

True. 64 is both a square number and a cube number.



Cube Numbers | **Deepest**

Read the statements carefully to help you work out which cube number is represented by each of the letters.

A	B	C	D	E
125	343	512	1000	1

10^3 is the greatest number.

Only one of these cube numbers has a single digit.

B starts and ends with the same digit.

A and C both have a 2 as one of their digits.

D and E have the same digit sum.

E is the smallest possible cube number.

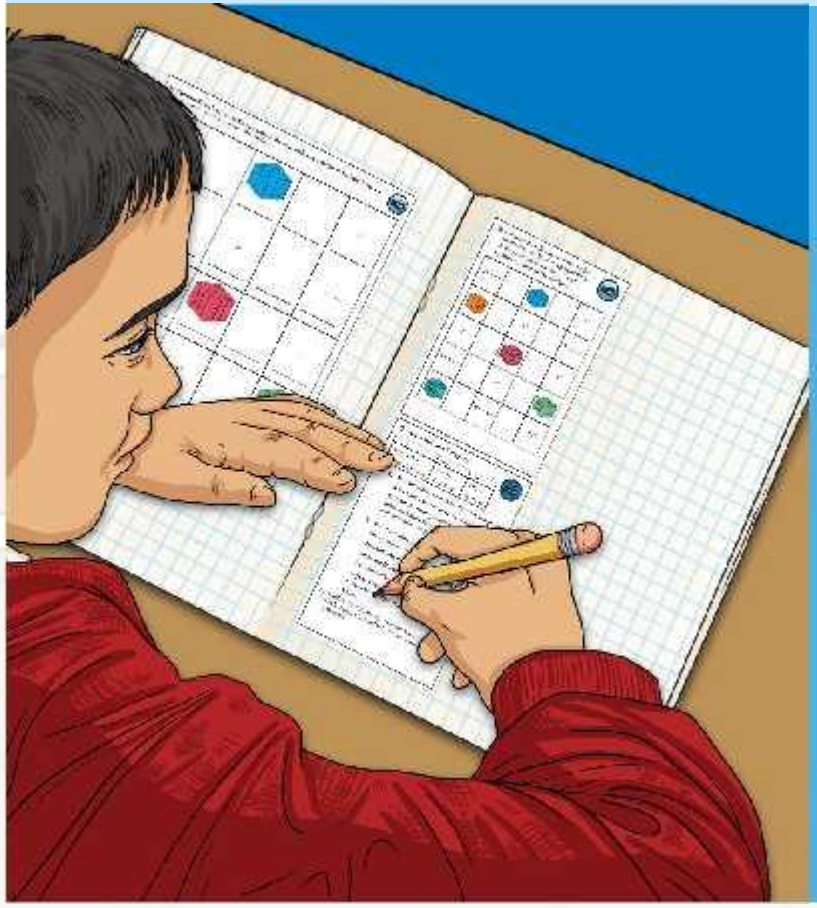
The greatest and smallest numbers are next to each other.

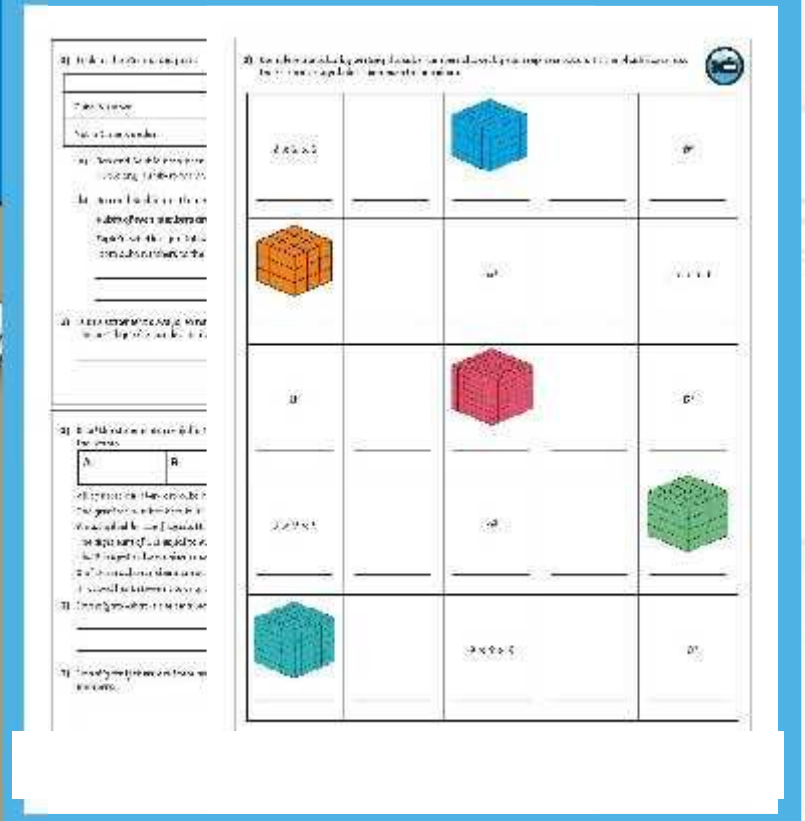
The numbers A to D are ordered in size from smallest to greatest.

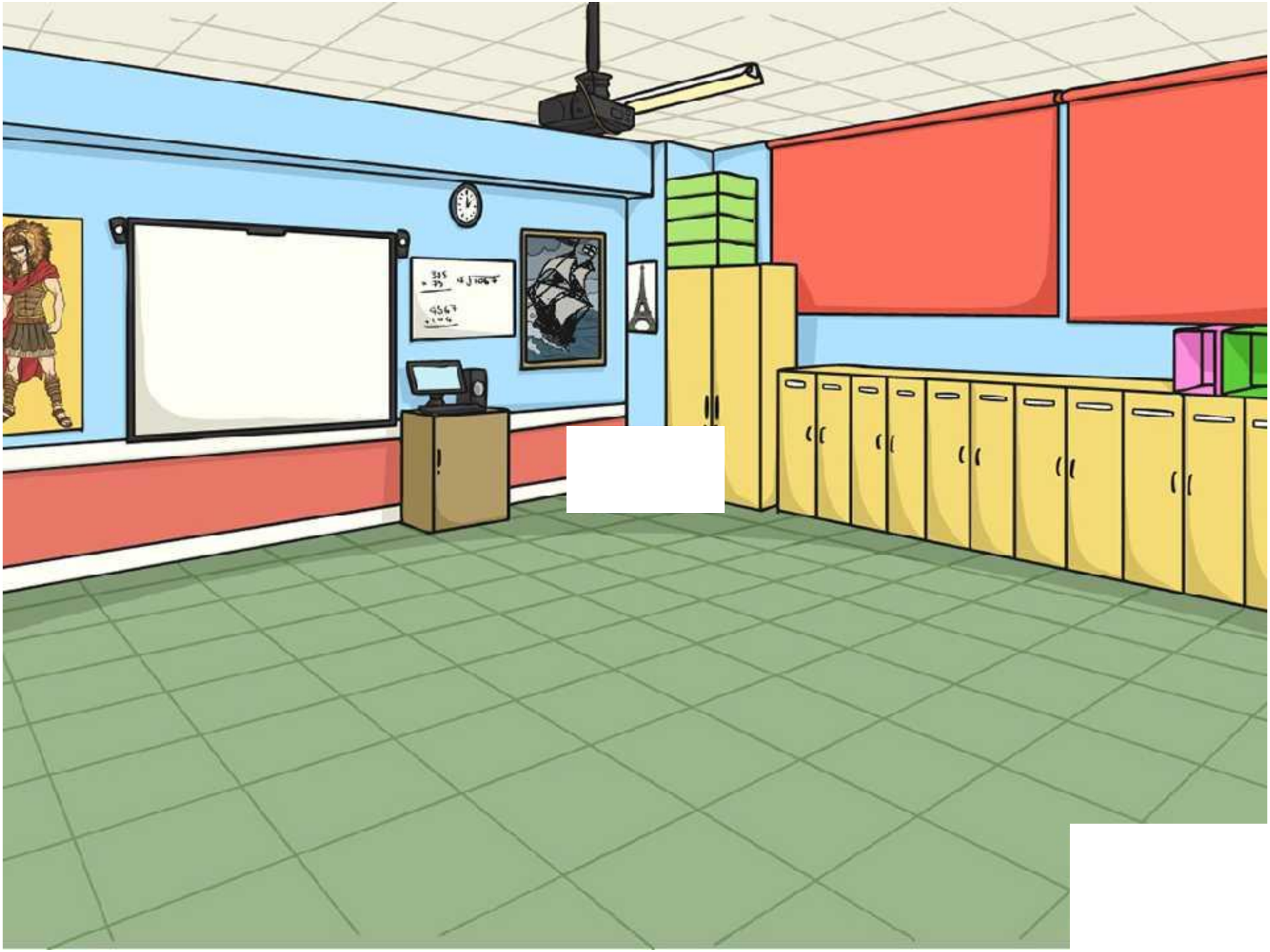
A and C have the same digit sum.

Cube Numbers

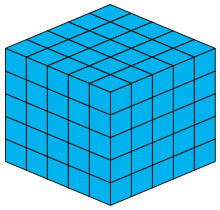
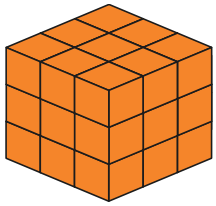
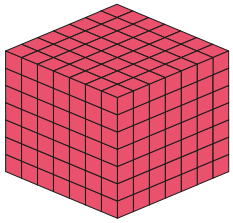
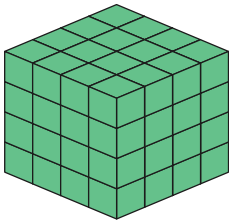
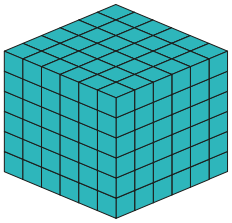
Dive in by completing your own activity!







1) Complete the table by writing the cube numbers shown by each representation. In the blank boxes, use the <, > and = symbols to compare the numbers.

$2 \times 2 \times 2$				6^3
		4^3		$1 \times 1 \times 1$
8^3				5^3
$9 \times 9 \times 9$		4^3		
		$9 \times 9 \times 9$		10^3

1) Look at this Carroll diagram:

	Odd	Even
Cube Number	111, 216	512, 16
Not a Cube Number	27, 343, 18	36, 12, 64

a) Ben and Sophia have been asked to sort a group of numbers into the correct places in the Carroll diagram. Circle any numbers which they have put in the wrong place and show where these numbers should be placed.

b) Ben and Sophia must decide whether this statement is true or false.

Cubes of even numbers are always even and cubes of odd numbers are always odd.

Explain whether you think the statement is true or false. Then, prove it by adding 5 more cube numbers to the Carroll diagram in the correct places.

2) Is this statement always, sometimes or never true?
The last digit of a cube number is the same as the last digit of its cube.

1) Read the statements carefully to help you work out which cube number is represented by each of the letters.

A	B	C	D	E

All of these numbers are cube numbers.

The greatest number here is 6^3.

A multiplied by itself equals B.

The digit sum of E is equal to A.

The 2 greatest cube numbers are next to each other.

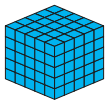
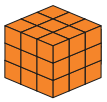
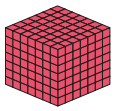
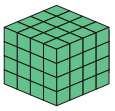
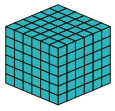
3 of these cube numbers are even.

3^3 lies between the only 2 numbers containing a 6 digit.

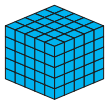
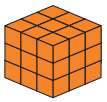
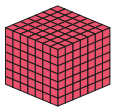
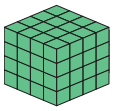
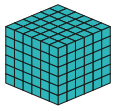
2) Investigate what is the smallest cube number that is the sum of 3 different cube numbers.

3) Investigate if there are there any other cube numbers, less than 10^3, which are the sum of 3 different cube numbers.

1) Complete the table by writing the cube numbers shown by each representation. In the blank boxes, use the <, > and = symbols to compare the numbers.

$2 \times 2 \times 2$				6^3
		4^3		$1 \times 1 \times 1$
8^3				5^3
$9 \times 9 \times 9$		4^3		
		$9 \times 9 \times 9$		10^3

1) Complete the table by writing the cube numbers shown by each representation. In the blank boxes, use the <, > and = symbols to compare the numbers.

$2 \times 2 \times 2$				6^3
		4^3		$1 \times 1 \times 1$
8^3				5^3
$9 \times 9 \times 9$		4^3		
		$9 \times 9 \times 9$		10^3

1) Look at this Carroll diagram:

	Odd	Even
Cube Number	111, 216	512, 16
Not a Cube Number	27, 343, 18	36, 12, 64

a) Ben and Sophia have been asked to sort a group of numbers into the correct places in the Carroll diagram. Circle any numbers which they have put in the wrong place and show where these numbers should be placed.

b) Ben and Sophia must decide whether this statement is true or false.

Cubes of even numbers are always even and cubes of odd numbers are always odd.

Explain whether you think the statement is true or false. Then, prove it by adding 5 more cube numbers to the Carroll diagram in the correct places.

2) Is this statement always, sometimes or never true? The last digit of a cube number is the same as the last digit of its cube.

1) Look at this Carroll diagram:

	Odd	Even
Cube Number	111, 216	512, 16
Not a Cube Number	27, 343, 18	36, 12, 64

a) Ben and Sophia have been asked to sort a group of numbers into the correct places in the Carroll diagram. Circle any numbers which they have put in the wrong place and show where these numbers should be placed.

b) Ben and Sophia must decide whether this statement is true or false.

Cubes of even numbers are always even and cubes of odd numbers are always odd.

Explain whether you think the statement is true or false. Then, prove it by adding 5 more cube numbers to the Carroll diagram in the correct places.

2) Is this statement always, sometimes or never true? The last digit of a cube number is the same as the last digit of its cube.

1) Read the statements carefully to help you work out which cube number is represented by each of the letters.

A
B
C
D
E

All of these numbers are cube numbers.

The greatest number here is 6^3.

A multiplied by itself equals B.

The digit sum of E is equal to A.

The 2 greatest cube numbers are next to each other.

3 of these cube numbers are even.

3^3 lies between the only 2 numbers containing a 6 digit.

2) Investigate what is the smallest cube number that is the sum of 3 different cube numbers.

3) Investigate if there are there any other cube numbers, less than 10^3, which are the sum of 3 different cube numbers.

1) Read the statements carefully to help you work out which cube number is represented by each of the letters.

A
B
C
D
E

All of these numbers are cube numbers.

The greatest number here is 6^3.

A multiplied by itself equals B.

The digit sum of E is equal to A.

The 2 greatest cube numbers are next to each other.

3 of these cube numbers are even.

3^3 lies between the only 2 numbers containing a 6 digit.

2) Investigate what is the smallest cube number that is the sum of 3 different cube numbers.

3) Investigate if there are there any other cube numbers, less than 10^3, which are the sum of 3 different cube numbers.