Multiplication and Division: Super Powers

Aim:	Success Criteria:	Resources:
Recognise and use square numbers and cube numbers, and the notation for squared and cubed. I can write and calculate powers. I can calculate square and cube roots.	I know how to write powers. I can calculate powers using a calculator. I can work out square and cube roots through trial and improvement.	**Lesson Pack** Calculators
	Key/New Words: Cubed, cube, multiply, product, indices, powers, square root, cube root, trial and improvement.	**Preparation:** Differentiated **Super Powers Activity Sheets** – one per child

Prior Learning: It will be helpful if the children know their multiplication tables up to 12 × 12 and can use written methods of multiplication.

Learning Sequence

Square Numbers: Children calculate square numbers mentally. They are challenged to see how many they can calculate in three minutes. When the three minutes have passed, they use calculators to check their answers.

Square and Cube Numbers: Use the arrays on the **Lesson Presentation** to remind children what square and cube numbers are and how to calculate them.

Powers: Explain that squares and cubes are an example of powers. Calculate other powers using the questions on the **Lesson Presentation**. Show the children how to use a calculator to solve problems involving powers.

Inverse Processes: Explain that finding square and cube roots is the inverse process to squaring and cubing numbers.

Trial and Improvement: Explain that square roots and cube roots can be found through trial and improvement.

Find It: Work with a partner to find square roots and cube roots using trial and improvement.

Super Powers: Children complete differentiated **Super Powers Activity Sheets**, writing and calculating powers and calculating square and cube roots through trial and improvement.

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Children use calculators to calculate powers. They calculate square roots using known facts.	Children use calculators to calculate powers. They find square and cube roots through the trial and improvement method.	Children use calculators to calculate powers. They find square and cube roots through the trial and improvement method.

How Did You Do It? The children explain to their talk partner how they calculated square and cube roots.

Masterit
   Explainit: Children make a poster or presentation to explain how to calculate powers using a calculator.
   Playit: Children work in pairs and roll three dice. The first two dice generate a two-digit number, the third is the power. They then race each other to calculate the answer using a calculator.