

Multiplicative reasoning 5.8		Length of unit: 3 weeks	Week beg:	Year:5	Teacher:	
Success criteria Pupils can explain and show properties of prime, composite, square and cube numbers and explain factor pairs related to these numbers. They understand and can explain the relationship between multiplication, division, fractions and percentages. They use this understanding to derive facts and solve problems.	Prior Learning: Check that children can already <ul style="list-style-type: none"> • count in multiples of 6, 7, 9, 25 and 100 recall multiplication and division facts for multiplication tables up to 12×12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling and harder correspondence problems such as n objects are connected to m objects • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days 			Resources Maths vocabulary book Using and Applying in every maths lesson Assessment through guided maths Think Maths! Pitch and Expectations Y6 and Y7 Mind the Gap (L3 to L4) Overcoming Barriers to Learning – L3 to 4 and L4 to 5 (available online) Securing Level 4 and Securing Level 5 documents Errors and Misconceptions in Maths at KS2		
Guidance Pupils connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions including >1 . Pupils make connections between percentages, fractions and decimals (for example, 100% represents a whole quantity and 1% is $\frac{1}{100}$, 50% is $\frac{50}{100}$, 25% is $\frac{25}{100}$) and relate this to finding 'fractions of'. See also guidance for sequence 5.3.						

Learning objectives

Pupils should be taught to:

Multiplication and division

- identify multiples and factors, including finding all factor pairs
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits by a one-digit number using a formal written method
- multiply and divide numbers mentally drawing upon known facts
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign

Fractions (including decimals and percentages)

- solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25

Measurement

- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation including scaling.

Pupil outcomes:

I can explain and represent how I know 16 is a square number and 27 is a cube number and how I can identify a prime number and a composite number between 16 and 27.

I can use my knowledge of factor pairs to organise a class of 32 children into teams.

I can explain and represent which I would rather win: $\frac{1}{4}$ of £300 or 40% of £150.