GCSE
Maths
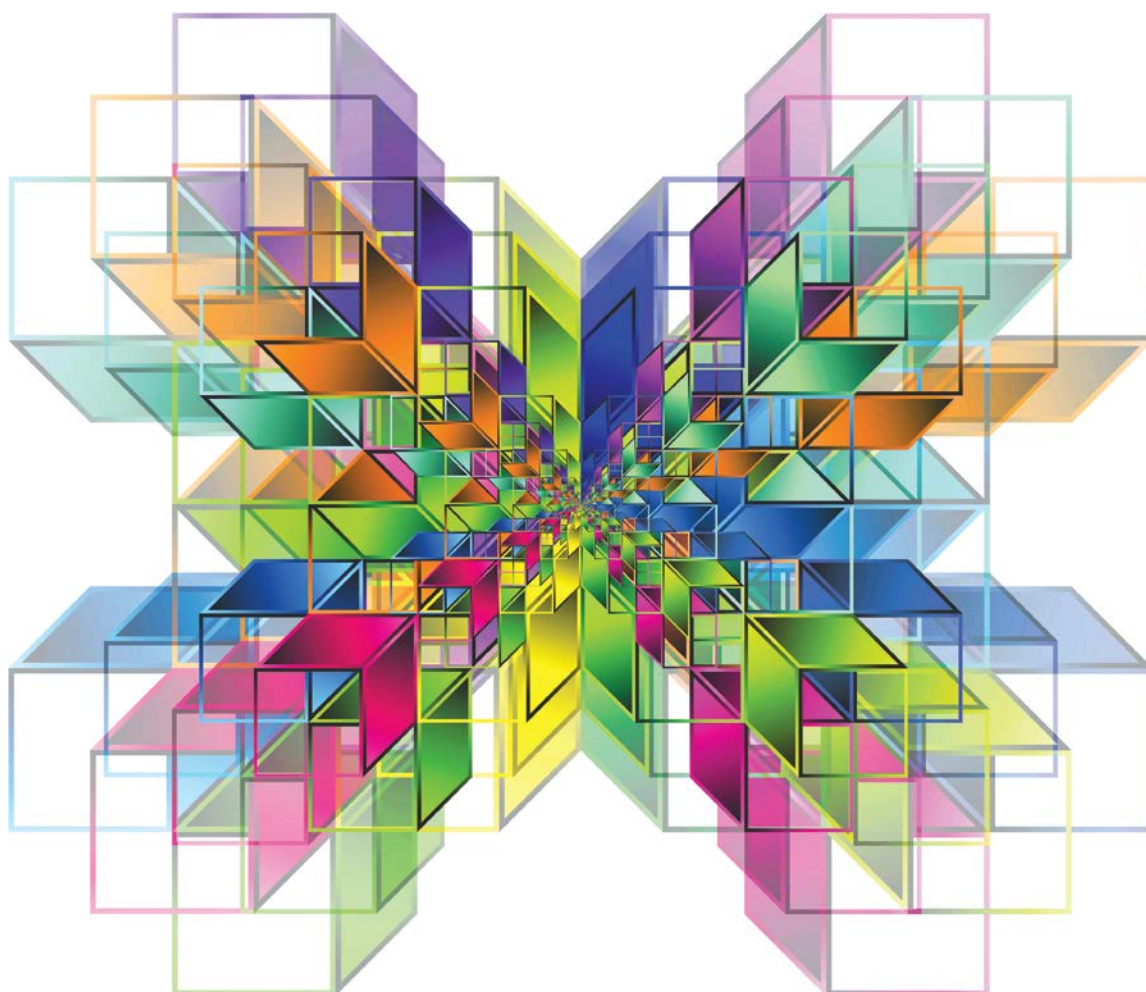
Summer hub schools network meeting

Specification extracts

Published: Summer 2019

3.3 Ratio, proportion and rates of change

R1

Basic foundation content	Additional foundation content	Higher content only
change freely between related standard units (eg time, length, area, volume/capacity, mass) and compound units (eg speed, rates of pay, prices) in numerical contexts	compound units (eg density, pressure) in numerical and algebraic contexts	

R2

Basic foundation content	Additional foundation content	Higher content only
use scale factors, scale diagrams and maps		

Notes: including geometrical problems.

R3

Basic foundation content	Additional foundation content	Higher content only
express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1		

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R4

Basic foundation content	Additional foundation content	Higher content only
use ratio notation, including reduction to simplest form		

R5

Basic foundation content	Additional foundation content	Higher content only
divide a given quantity into two parts in a given part : part or part : whole ratio		
express the division of a quantity into two parts as a ratio		
apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations)		

Notes: including better value or best-buy problems.

R6

Basic foundation content	Additional foundation content	Higher content only
express a multiplicative relationship between two quantities as a ratio or a fraction		

R7

Basic foundation content	Additional foundation content	Higher content only
understand and use proportion as equality of ratios		

R8

Basic foundation content	Additional foundation content	Higher content only
relate ratios to fractions and to linear functions		

Notes: see also N11, R14

R9

Basic foundation content	Additional foundation content	Higher content only
define percentage as 'number of parts per hundred' interpret percentages and percentage changes as a fraction or a decimal, and interpret these multiplicatively express one quantity as a percentage of another compare two quantities using percentages work with percentages greater than 100% solve problems involving percentage change, including percentage increase/decrease and original value problems, and simple interest including in financial mathematics		

Notes: see also N2, N12

R10

Basic foundation content	Additional foundation content	Higher content only
solve problems involving direct and inverse proportion, including graphical and algebraic representations		

R11

Basic foundation content	Additional foundation content	Higher content only
use compound units such as speed, rates of pay, unit pricing	use compound units such as density and pressure	

Notes: including making comparisons.

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R12

Basic foundation content	Additional foundation content	Higher content only
compare lengths, areas and volumes using ratio notation scale factors	make links to similarity (including trigonometric ratios)	

Notes: see also G19, G20

R13

Basic foundation content	Additional foundation content	Higher content only
	understand that X is inversely proportional to Y is equivalent to X is proportional to $\frac{1}{Y}$	
	interpret equations that describe direct and inverse proportion	construct and interpret equations that describe direct and inverse proportion

R14

Basic foundation content	Additional foundation content	Higher content only
	interpret the gradient of a straight-line graph as a rate of change recognise and interpret graphs that illustrate direct and inverse proportion	

Notes: see also A15, R8

R15

Basic foundation content	Additional foundation content	Higher content only
		interpret the gradient at a point on a curve as the instantaneous rate of change apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts

Notes: see also A15

R16

Basic foundation content	Additional foundation content	Higher content only
	set up, solve and interpret the answers in growth and decay problems, including compound interest	and work with general iterative processes

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