

KS3 STAGE 9, RATIO AND PROPORTION, MATHS

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:
<ul style="list-style-type: none"> • Find a relevant multiplier in a situation involving proportion • Plot the graph of a linear function • Understand the meaning of a compound unit <p>Convert between units of length, capacity, mass and time</p>	<ul style="list-style-type: none"> • <u>Direct and Inverse proportion</u> • You will solve problems involving different types of proportion and investigate ways of representing proportion • Know the difference between direct and inverse proportion • Recognise direct (inverse) proportion in a situation • Know the features of a graph that represents a direct (inverse) proportion situation • Know the features of an expression (or formula) that represents a direct (inverse) proportion situation • Understand the connection between the multiplier, the expression and the graph • <u>Similar shapes</u> • You will understand and solve problems involving congruence and similarity • Know the meaning of congruent (similar) shapes • Identify congruence (similarity) of shapes in a range of situations 	<p>Direct proportion, Inverse proportion, Multiplier, Linear, Congruent, Congruence, Similar, Similarity, Compound unit, Density, Population density, Pressure.</p> <p>Highlighted words <u>MUST</u> be explicitly taught, defined and recorded in student books as they are first met. Other listed words may be introduced verbally or written in a similar format.</p>

	<ul style="list-style-type: none"> • Identify the information required to solve a problem involving similar shapes • Finding missing lengths in similar shapes • <u>Compound Units</u> • You will learn how to use compound units in a range of situations • Understand why speed, density and pressure are known as compound units • Know the definition of density (pressure, population density, speed) • Solve problems involving density (pressure, speed) • Convert between units of densities • 							
<p>Challenge and Support:</p>	<p>World wide learning/ links to 21st century:</p>	<p>Cultural capital/ Industry/ Enrichment:</p>						
<ul style="list-style-type: none"> • Show me an example of two quantities that will be in direct (inverse) proportion. And another. And another ... • Convince me that this information shows a proportional relationship. What type of proportion is it? <table border="1" data-bbox="336 1117 526 1305"> <tr> <td>40</td> <td>3</td> </tr> <tr> <td>60</td> <td>2</td> </tr> <tr> <td>80</td> <td>1.5</td> </tr> </table> <p>Which is the greatest density: 0.65g/cm^3 or 650kg/m^3? Convince me.</p>	40	3	60	2	80	1.5	<p>When you enlarge a photo, project an image on a screen or make scale models you are dealing with similarity. Many toys and other objects are scaled similar versions of larger objects.</p>	<ul style="list-style-type: none"> • NRICH provides thousands of free online mathematics resources for ages 3 to 18 - completely free and available to all via their website (nrich.maths.org/). These resources aim to: <ul style="list-style-type: none"> ○ Enrich and enhance the experience of the mathematics curriculum for all learners ○ Develop mathematical thinking and problem-solving skills ○ Offer challenging, inspiring and engaging activities
40	3							
60	2							
80	1.5							

		<ul style="list-style-type: none"> Field trips: Norwich Castle Students are taken to Norwich Castle to complete various activities. One activity requires to students to measure the castle's stone wall and compare this to the total surface area of the sides.
Historical, Social, Moral, Spiritual, Cultural context:	Cross curricular links/ literacy/numeracy:	Common misconceptions:
<ul style="list-style-type: none"> Ratio is used in many different real life situations. Converting between different currencies, working out which packet of crisps is the best value, mixing cement and scaling up a recipe all involve using ratios 	<ul style="list-style-type: none"> Science: science can provide the context for many basic ratio problems such as concentration of substances within a chemical compound. Geography: statistics on populations in different parts of the world at different periods, given as ratios and categorised according to the requirements/limitations of the data. Art: see proportion wheel for creating art cards of different sizes by reducing pictures in different proportions. Literacy: Interpretation of written problems with conversion between these types of problems to pictorial and number representation. Correct use of specialised vocabulary. 	<ul style="list-style-type: none"> Many pupils will want to identify an additive relationship between two quantities that are in proportion and apply this to solve problems The word 'similar' means something much more precise in this context than in other contexts pupils encounter. This can cause confusion. Some pupils may think that a multiplier always has to be greater than 1
Assessment timeline:		
<ul style="list-style-type: none"> Topic test assessments (BAM tests) are conducted at the end of each topic. These are roughly after 2 weeks per topic, but this may vary. Pre-checks are conducted at the start of the topic to test student prior knowledge. This informs lesson planning and delivery. 		

- Tracking assessments are conducted once a term with end of year formal exams, for reporting and checking cumulative knowledge.
- Testing data leads to discussions about setting, intervention groups and individual in-class intervention.
- All students have access to a wide range of resources to develop their understanding.

Home learning

- Homework is set weekly for each group. This will often be via interactive websites with immediate feedback and support.
- Teachers have the autonomy to use whichever resource they wish within the criteria set for the topic.
- Students have access to lots of resources at home, including: Kerboodle, MyMaths, Mathswatch, PiXL Maths APP, PiXL Tmes Table App.

Feedback

- Feedback is given after each topic test, tracking assessment and end of year exams. After tracking and end of year exams, this will include “Formative Marking” sheets which give feedback question by question to help support the students with priorities for further work.

Length of unit (duration indicated in lessons)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Unit:																													