

KS3 STAGE 8, RATIO AND PROPORTION, MATHS

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:
<p>Prior key stage 2 content reviewed using pre-tests and whiteboard work at the start of each topic.</p> <p>Proportional reasoning</p> <p>Key Skills:</p> <ul style="list-style-type: none"> • Understand and use ratio notation • Divide an amount in a given ratio 	<p>Proportional reasoning</p> <p>Key Skills:</p> <p>Ratio</p> <ul style="list-style-type: none"> • Identify ratio in a real-life context • Write a ratio to describe a situation <p>Proportion</p> <ul style="list-style-type: none"> • Identify proportion in a situation • Find a relevant multiplier in a situation involving proportion • Use fractions fluently in situations involving ratio or proportion • Understand the connections between ratios and fractions • Understand the meaning of a compound unit • Know the connection between speed, distance and time • Solve problems involving speed • Identify when it is necessary to convert quantities in order to use a sensible unit of measure 	<ul style="list-style-type: none"> • Ratio, Proportion, Proportional, Multiplier, Speed, Unitary method, Units and Compound unit. <p>Notation</p> <ul style="list-style-type: none"> • Kilometres per hour is written as km/h or kmh^{-1} • Metres per second is written as m/s or ms^{-1} <p>Highlighted words MUST 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>
Challenge and Support:	World-wide learning/ links to 21 st century:	Cultural capital/ Industry/ Enrichment:
<ul style="list-style-type: none"> • Show me a set of objects that demonstrates the ratio 3:2. And another, and another ... • Convince me that the ratio 120mm:0.3m is equivalent to 2:5 	<ul style="list-style-type: none"> • Outside of the maths class, it is easy to recognize ratios in the real world. Common examples include comparing prices per ounce while grocery 	<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

<ul style="list-style-type: none"> • Always / Sometimes / Never: the smaller number comes first when writing a ratio • Using Cuisenaire rods: If the red rod is 1, explain why d (dark green) is 3. Can you say the value for all the rods? (w, r, g, p, y, d, b, t, B, o). Extend this understanding of proportion by changing the unit rod e.g. if $r = 1$, $p = ?$; $b = ?$; $o + 2B = ?$ If $B = 1$; $y = ?$ $3y = ?$; $o = ?$ $o + p = ?$ If $o + r = 6/7$; $t = ?$ 	<p>shopping, calculating the proper amounts for ingredients in recipes and determining how long car trip might take. Other essential ratios include pi and phi (the golden ratio).</p>	<p>(rich.maths.org/). These resources aim to:</p> <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 <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.
<p>Historical, Social, Moral, Spiritual, Cultural context:</p>	<p>Cross curricular links/ literacy/numeracy:</p>	<p>Common misconceptions:</p>
<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. 	<ul style="list-style-type: none"> • Some pupils may think that $a:b$ always means part:part • Some pupils may try to simplify a ratio without first ensuring that the units of each part are the same • Many pupils will want to identify an additive relationship between two quantities that are in proportion and apply this to other quantities in order to find missing amounts

- Literacy: Interpretation of written problems with conversion between these types of problems to pictorial and number representation.
- Correct use of specialised vocabulary.

Assessment timeline:

- 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:																													