

Year 8

Ratio and Proportion

Autumn 2

Level Ladder

All students are expected to master at least the Level 5 content by the end of the half term.

Check Arbor or ask your child what their current working and target level is in Maths

EG:

5A - mastered all of the Level 5 content

5B - mastered some of the Level 5 content

5C - mastered all of the Level 4 content and beginning to master some Level 5 content

3	★ Recognise a ratio and the symbols involved
4	★ Begins to understand simple ratio. ★ Given a selection of red and blue cubes, write the ratio of red cubes to blue cubes, and the ratio of blue cubes to red cubes. ★ Of a team of 10 people, 3 are male. What is the ratio of males to females in the team? ★ Show me a set of coloured pencils that are in the ratio 2:3

	<ul style="list-style-type: none"> ★ True/Never/Sometimes: The ratio 1:4 is the same as the ratio 4:1, the bigger number comes first in a ratio ★ What is the same/different about: The ratio 1:4 and the ratio 4:1
5	<ul style="list-style-type: none"> ★ Write 16:12 in its simplest form ★ A teaspoon holds 5ml of medicine and a bottle holds 100ml of medicine. Find the ratio of the capacity of the teaspoon to the capacity of the bottle. Write the answer in its simplest form ★ Understand the meaning of 'mix sand and cement in the ratio 5:1' ★ Show me a ratio which simplifies to 2:7 ★ What is wrong: To simplify the ratio 32:48 keep dividing both sides by 2 until you can't do it any more ★ True / Never / Sometimes: To simplify the ratios keep dividing both sides by 2 until you can't do it any more ★ What is the same / different: 4:5 and £4:500p, 2:3, 34:51 and 3:2 ★ Convince me that $19:95 \equiv 1:5$ ★ Draw and use a conversion graph for pounds and Euros ★ Show me an example of a line graph where the intermediate values do not have a meaning. ★ What is wrong with this graph? (a line graph where the intermediate values do not have a meaning) ★ Convince me that you can use this graph (conversion graph between litres and gallons – up as far as 20 gallons) to find out how many litres are roughly equivalent to 75 gallons. ★ Complete each of the following: <ul style="list-style-type: none"> 0.2 litres \equiv ____ ml 658 cm \equiv ____ metres 56 grams \equiv ____ kg ____ cm \equiv 73 mm 293 mm \equiv ____ metres ____ mg \equiv 2.4 grams ★ Complete each of the following:

8 inches » ____ cm

44 lbs » ____ kg

90 litres » ____ gallons

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- ★ Use the equivalence of fractions, decimals and percentages to compare proportions
- ★ Divide a quantity into 2 or more parts in a given ratio. Divide 80cm in the ratio 3 : 7
- ★ Solve harder problems involving ratio and direct proportion
- ★ Use proportional reasoning to solve a problem
- ★ Potting compost is made from loam, peat and sand in the ratio 7:3:2 respectively. A gardener used 1.5 litres of peat to make compost. How much loam did she use? How much sand?
- ★ The angles in a triangle are in the ratio 6:5:7. Find the sizes of the three angles.
- ★ Show me a quantity divided correctly into a ratio of three parts.
- ★ Show me how pupils could be in a school if the ratio of pupils with brown hair, blond hair, black hair in a school is 4:2:5.
- ★ What is the same/different about: 2:7, 3:4:2, 1:4:4
- ★ Convince me that if the ratio of pupils in a school with brown hair, blond hair, black hair in a school is 4:2:5 then there cannot be 122 pupils in the school.
- ★ Convince me that if the ratio of pupils in a school with brown hair, blond hair, black hair in a school is 4:2:5 and there are 24 pupils with blond hair, the number of pupils in the school is 132.
- ★ The graph below shows information about a race between two animals – the hare (red) and the tortoise (blue). Who was ahead after 2 minutes? What happened at 3 minutes? At what time did the tortoise draw level with the hare? Between what times was the tortoise travelling fastest? By how much distance did the tortoise win the race?
- ★ Show me a description of a journey that produces a distance/ time graph with a shape similar to a trapezium.

	<ul style="list-style-type: none"> ★ True/never/sometimes: On a distance/ time graph, if the graph is horizontal then the object is travelling at a constant speed. On a distance/ time graph, if the graph has a negative gradient then the object is travelling downhill. ★ Convince me that on a distance/ time graph, if the graph is horizontal then the object is stationary.
7	<ul style="list-style-type: none"> ★ Convince me that: any A sized paper is an enlargement of any other A sized paper the ratio of the sides of any A sized paper is the square root of 2 ★ Understand and use proportionality ★ Calculate the result of any proportional change using multiplicative methods ★ Use compound measures in science, geography or PE ★ Compare the speed of a sprinter (100m in 10 seconds) to the speed of a cyclist (13 miles in 1 hour) ★ Show me an example of a suitable unit for the measurement of the speed of a boat, an aeroplane, the space shuttle, a snail, a Year 11 walking to my lesson, ... ★ What is the same/different: 5 mph and 8km per hour, A distance-time graph with a positive gradient and a distance-time graph with a negative gradient ★ True/Never/Sometimes: A sprinter travelling 100m in 10 seconds is faster than a cyclist travelling 13 miles in 1 hour ★ Convince me that: You need to put time on the horizontal axis, The area under a velocity-time graph gives you the distance travelled ★ Understand and apply Pythagoras' Theorem when solving problems in 2-D
8	<ul style="list-style-type: none"> ★ I can use the unitary method when comparing If a 250g packet of cereal costs £1.20 and a 350g packet costs £1.70, which packet gives better value for money? ★ Calculate the original quantity given the result of a proportional change. ★ Understand and use trigonometrical relationships in right angled triangles and use these to solve problems, including those involving bearings

