

Ratios

by Mark Gillan

What is a ratio?

- Ratio describes the relative relationship between categories
- A ratio compares one thing to another
- For example, 3 red tiles to 4 blue tiles

For example,

3 red tiles to 4 blue tiles:



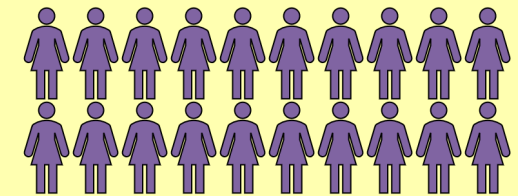
is... 3 : 4

Other examples

- ➡ A building site has a total of 30 workers
- ➡ The company has 10 male workers and 20 female workers
- ➡ The ratio would be 10/20 or written correctly as a ratio it would be 10:20
- ➡ The 10/20 can be brought down to a smaller 1 to 2 written as 1:2
- ➡ Meaning: for every 1 male worker there is 2 female workers

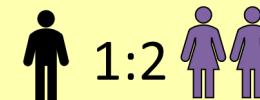


10 Male workers



20 Female workers

Ratio

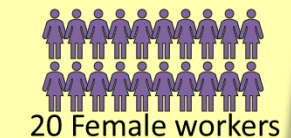


Scalability

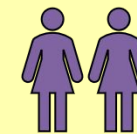
- Ratios can assist with how something can be scaled in comparison to another
- For example, if the building site doubled their workforce with the same ratio of 1:2
- The original 10 male and 20 female would now be ... 20 male and 40 women
- The ratio remains 1:2
- For every 1 male there is 2 female workers
- Everything increases within the same ratio. If it trebled. 3x the number of male and 3x female at the ratio of 1:2 would make...
- It would now be:
30 male workers and 60 female workers



Doubled workforce
at the same ratio



Ratio
1:2



Ratio to emphasise scale

- Model railways come in different shapes, sizes and scales
- Scaling of model railway sets is declared as the size of the model set compared to the relative size difference to real-life locomotives and surroundings replicated by the models

For example:

- OO gauge is to a scale of 4mm to 1ft (304mm)
- A ratio of 1:76
- Meaning, for every measurement of the miniature, the real-life size is 76 times bigger
- HO gauge is to a scale of 3.5 mm to 1ft
- A ratio of 1:87
- Meaning, for every measurement of the miniature, the real-life is 87 times bigger



Calculating the ratio

- ➡ If a model railway is 4mm for every real-life 1ft (304mm)
- ➡ Then, we divide 304mm by the 4mm
- ➡ Answer: 76mm
- ➡ Therefore, for every 1mm scale model there is 76mm full scale locomotive and surroundings
- ➡ The ratio is 76:1 scaled downwards
- ➡ Ratio can be used for any scalability to ensure the correct replication of sizes in proportion to the original
- ➡ Ratio sizes is the **proportion** of one compared to the other

Try this one

- ➡ When baking for more than two people and a relative increase is required
- ➡ The ingredients listed had been for 2 hungry people but we now have 5 hungry people
- ➡ What is the ratio for increased ingredients within the recipe?
- ➡ Originally, the recipe required 100 grams of sugar and 250ml of milk
- ➡ How much sugar is now required and how much milk?



ANSWER

- ➡ When baking for more than two people and a relative increase is required
- ➡ The ingredients listed had been for 2 hungry people but we now have 5 hungry people
- ➡ What is the ratio for increased ingredients within the recipe?
- ➡ Originally, the recipe required 100 grams of sugar and 250ml of milk
- ➡ How much sugar is now required and how much milk?
- ➡ From 2 people to 5 people
- ➡ We divide the larger number of 5 by the lower number 2
- ➡ The ratio is calculated as being
1:2.5
- ➡ Sugar $100\text{g} \times 2.5 = 250\text{g}$
- ➡ Milk $250\text{ml} \times 2.5 = 625\text{ml}$