

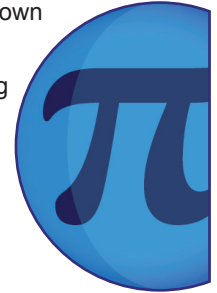


# Ratios: The Maths of Baking

## Key Learning Content

This film uses the example of making a cake to illustrate equivalent ratios. The cake ingredients are shown as a string of ratios; bigger or smaller cakes can be made by keeping the ingredients in the same ratio. The ratios are simplified by dividing both sides by a common factor and can be scaled up by multiplying through by the same number.

No prior knowledge of ratios is required prior to watching the film.



### Core Outcomes

#### Learning Points

- Be able to use ratio notation including reduction to its simplest form and expressing in the form 1:n.
- Be able to recognise equivalent ratios.

#### Suggested Activities

- Scale up recipe ingredients using ratios.
- Sort ratios by equivalence.

### Extension Outcomes

#### Learning Points

- Be able to divide a quantity in a given ratio, e.g. share £416 in the ratio 5:3.
- Be able to solve word problems about ratio and proportion, including maps and scale diagrams.

#### Suggested Activities

- Get students to divide lottery winnings between them using different ratios.
- Set problems where students have partial information about quantities divided in a given ratio and have to piece together the missing parts.



All cakes are made by getting the ratio of ingredients just right.

## Related Films

To use before the lesson plan:

### How Long Is a Metre?

This film provides an introduction to one of the most-used standard measurements.

### Decimals: Decimal Day

This film looks at the radical changes to money and measurements in the UK 50 years ago.

To use after the lesson plan:

### Ratios: Currency Exchange

This film examines the use of ratios between different currencies to determine how much local money can be bought by the traveller.

### The Odds Are Against You

This film shows how knowledge of ratios can help you work out when a bet is a bad deal.

### Why Are Eggs Egg-Shaped?

This film analyses the distinctive shape of eggs, including the ratio between their length and width.

## Guide Lesson Plan

### Introduction

Tell the story of two lottery winners who agree to split their £300k winnings in the ratio 1:3. The one with the smaller share gets one third (£100k) and walks away. Should the other one be happy?

### Show Film

### Ratios: The Maths of Baking

### Main Activity

#### Foundation

Take recipe ingredients for food to feed a fixed number of people and adjust them for different numbers of people. Or take recipe ingredients to make a fixed number of food items (e.g. 12 cakes) and adjust them for different numbers of items. Observe that all the ratios created by this method are equivalent ratios, then take different ratios and group them together according to which are equivalent to each other.

#### Advanced

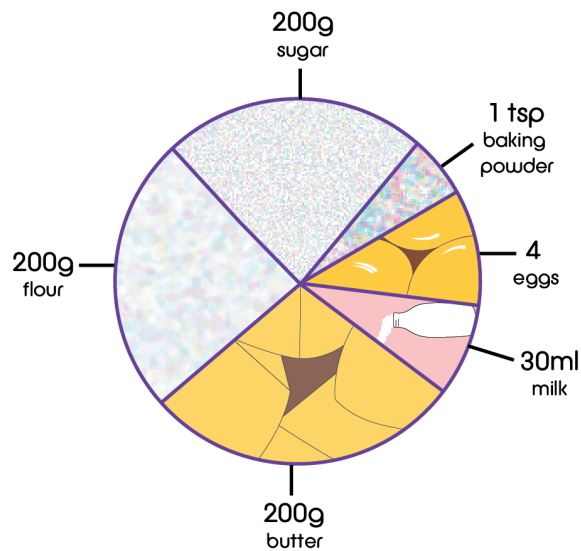
Explain how to divide a given quantity in a given ratio then get the students to divide an imaginary lottery win between themselves using different ratios. Explore how the ratios relate to the fraction of the total that each person ends up with. Then set problems where the total lottery win is not known, but individual winnings are, together with the ratio split. Get students to work out the total win.

## Extension Activity

Explore how to combine separate ratios, e.g.  $x:y$  is  $2:3$  and  $y:z$  is  $5:2$ , what is  $x:z$ ? Set real world problems that can be analysed in this way, e.g. if a school trip needs two teachers for every 15 students and one reserve teacher is needed for every three teachers, how many reserve teachers are needed for a school trip for 450 students?

## Optional Extra

Get students to research all the different applications of ratios in the real world, from map scales to betting odds.



**200g : 200g : 200g : 4 : 1tsp : 30ml**  
 sugar      flour      butter      eggs      baking powder      milk

**A ratio is simply a comparison between numbers, and the ingredients involved. The recipe for a sponge cake can be written like this.**