



Fractions and Rationing

Learning Objectives:

- To know how calories are calculated;
- To know how food was safely rationed in the war;
- To know that some foods provide more calories than others.

Maths Skills:

- Solving real-life word problems
- Halving and quartering amounts
- Finding halves and quarters of mixed numbers

Resources:

- 'Elsie Widdowson' PowerPoint
- White boards or paper on which to draw an arrow

WARM UP

Show 'Elsie Widdowson' PowerPoint *Slide 1* and give out white boards or paper so that the children can draw an arrow on it to join in the game. Play Higher or Lower – following the instructions on the slide. Click to advance the game and reveal each calorific value.

Ask:

- Were there any foods which surprised you?
- How many pieces of toast do you think are in 100g? (about 4)

INTRODUCTION

Watch this video on rationing:

<https://www.youtube.com/watch?v=7e5oygzUrs4>

Tell the children:

Before the start of WW2, Britain imported a lot of food from other countries. During the war, these imports dropped to less than half as German submarines would attack ships which were bringing in the food. The people of Britain had much less food available than they were used to. In order to stop people who could afford higher prices buying up all the stock, leaving nothing for poorer families, rationing was introduced. It was designed to be a fair system. Every person could get the same amount of the rarer items. But how much of each item did each person need to be healthy?

Elsie Widdowson was born in 1906. She was one of the first female graduates of Imperial College, London, where she studied chemistry. She researched ways to calculate the amount of sugar in an apple as her part of her PhD. When WW2 broke out, the foods that were in short supply were butter, meat, cheese, fish and eggs. Elsie and a fellow scientist, Robert McCance decided to see whether it was possible to live healthily on bread, cabbage and potatoes. They experimented on themselves by following this strict diet and found that it didn't do them serious harm even when they did a lot of exercise.

So, when the government asked them to work out exactly how much of each rationed food was needed by each person each week, they were able to work out what would be enough to stay healthy.

Watch this video about Elsie:

<https://www.bbc.co.uk/teach/class-clips-video/science-ks2-discovering-the-work-of-elsie-widdowson/zvr7nrd>

Watch the first 3 minutes of this video to see what those rations actually looked like:

<https://www.youtube.com/watch?v=o9wNJ78S2GY>

Tell the children:

Imagine you fancied pancakes for breakfast.

Show *Slide 2* of the 'Elsie Widdowson' PowerPoint.

The children must halve a recipe for pancakes as they only have 1 egg in their rations. If the children need help to tackle the question, remind them that you can halve a $\frac{1}{2}$ to make a $\frac{1}{4}$.

Use *Slide 3* to check answers.

Show *Slide 4* to set a harder challenge.

Tell the children:

Imagine that it was your birthday and you wanted to bake a cake. You might have to save up a few weeks' worth of rations just for the one cake! Or you could try making a smaller version of the recipe.

Use *Slide 5* to check answers.

Show *Slide 6*

Tell the children:

Use your division skills to calculate the calories like Elsie.

EXTENSION

Can you make your favourite dish using only one week of rations? Find a recipe on the internet and work out if it can be made using your rations. How much of the recipe can you make? How many people would it feed? If you need to convert grams to ounces, you can find a suitable conversion website online.

REVIEW

ALL: children know that some foods are higher in calories and that you calculate the energy in the food by burning it and measuring the energy that is released. They can halve amounts, including mixed numbers, to solve a real-life problem.

MOST: children know that food was rationed in the war and Elsie used her scientific skills to calculate the size of rations which would keep people healthy. They can also quarter amounts including mixed numbers.

SOME: children are able to convert recipes written in grams to ounces (using conversion tables on the internet) and re-write their favourite recipes using only one week's rations.

