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| **Easy cookie recipe – KS1 maths** |
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| Scaling up a recipe |
| **Subject(s):** Maths**Approx. time:** 15 - 30 minutes |  | **Key words / Topics:** * Scaling up/down
* Ratio
* Proportion
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| **Suggested Learning Outcomes**  |  |  |
| * To be able to solve a scaling up problem involving a recipe using maths skills.
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| **Introduction** |  |  |
| This is one of a set of resources developed to support the teaching of the primary national curriculum. They are designed to support the delivery of key topics within maths and science. This resource focusses on developing the understanding of ratio, fractions and scaling, by scaling up ingredients in a recipe. It could also be linked to learning in food technology, to demonstrate a practical application of maths.  |
| **Purpose of this activity**In this activity learners will scale up a cookie recipe that makes six cookies to a recipe that make 12 or 24 cookies. The time to make cookies is not included in this activity, although if time and facilities are available they can be made. This activity could be used as a starter or main activity to introduce ratio and proportion.  |
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| **Activity** |  | **Teacher notes** |
| **Introduction (5-10 minutes)**Teacher to explain that learners are going to perform an activity where they scale up a recipe. Teacher to present the recipe for 6 cookies and explain the measures being used i.e. grams and tsp.**Scaling up Activity (5-10 minutes)**Hand out the scaling up worksheet to the learners. Learners scale up the recipe to 12 and 24 cookies.**Plenary discussion (5-10 minutes)**Compare learners results to those in the presentation. Are they the same? If not, why not? And what effect would any variation have on the cookies?  |  | This activity could be done as individuals or in pairs.**Scaling up Activity Worksheet**It may assist to have scales, spoons and pre-measured ingredients available for illustration. It could be noted that the recipe is a combination of weights, measured by the scales, and volumes, measured by the teaspoons (tsp) or proportion of an egg.The recipe is based on a recipe on the BBC good food website, listed in the additional websites below.To make the recipe, if required:1. Heat oven to 180C/160C fan/gas 4.
2. break the chocolate into small pieces.

 1. Cream the butter and sugar together until light and fluffy…
2. … then beat in the vanilla and egg.
3. Next stir in the flour, bicarbonate of soda, salt and chocolate.
4. Scoop large tablespoons of the mixture onto parchment lined trays trays, leaving space between each to allow for spreading.
5. Bake for 10-12 mins or until firm at the edges but still soft in the middle (they will harden a little as they cool).
6. Transfer to a wire rack to cool.

The cookies will keep for three days in an airtight container. |
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| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| Some learners may benefit from focussing on just scaling up one measurement type i.e. grams or tsps. |  | Work out the ingredients for bigger parties i.e. 50 or 100 people.Watch video: **BBC Bitesize** – What is a scale factor: <https://www.bbc.co.uk/bitesize/topics/z3pfb9q/articles/zgrn8mn> |
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| * Projector/Whiteboard
* Printed worksheet
 |  |  Easy cookie recipe presentationicon-doc Easy cookie recipe worksheet |
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| **Additional websites** |  |  |
| * **BBC good food** – Easy cookie recipe <https://www.bbcgoodfood.com/recipes/chocolate-chunk-cookies>
* **BBC Bitesize** – How can scale help me multiply: <https://www.bbc.co.uk/bitesize/topics/zm982hv/articles/zkwggwx>
* **BBC Bitesize** – What is a scale factor: <https://www.bbc.co.uk/bitesize/topics/z3pfb9q/articles/zgrn8mn>
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| **Related activities (to build a full lesson)** |  |  |
| **Starters** (Options) * Watch video: **BBC Bitesize** – How can scale help me multiply: <https://www.bbc.co.uk/bitesize/topics/zm982hv/articles/zkwggwx>
* Discuss what measurements are used and how they are approximate.
 | **Extension** (Options)* Watch video: **BBC Bitesize** – What is a scale factor:

<https://www.bbc.co.uk/bitesize/topics/z3pfb9q/articles/zgrn8mn>* Scale up the party food for 50 or 100 people.

**Plenary*** Compare learners results to those in the presentation. Are they the same? If not, why not? And what effect would any variation have on the cookies?
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| **The Engineering Context** film |
| * Food engineers are employed in food processing, food machinery, packaging and ingredient manufacturing. When a new food product, e.g. a breakfast cereal, has been developed they may have to plan to scale up the production to make thousands of boxes of it each day.
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| **Curriculum links**  |
| **England: National Curriculum**MathsKS2 Year 6 - Ratio and Proportion.* solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
 | **Northern Ireland Curriculum**KS2 NumberMeasures* develop skills in estimation of length, weight, volume/capacity, time, area and temperature.
* appreciate important ideas about measurement including the continuous nature of measurement and the need for appropriate accuracy.
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| **Scotland: Curriculum for Excellence**Numeracy and mathematicsFractions, decimal fractions and percentages.* MNU 3-08a
 | **Wales: National Curriculum** Mathematics – Using number skillsFractions, decimals, percentages and ratio* use doubling and halving strategies when working with simple proportions
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| **Assessment opportunities** |
| * Informal teacher assessment of the activity through observing the task and Q&A.
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