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| **Practical Probability** |
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| Working out the probabilities of picking fruit from a bag |
| **Subject(s):** Maths**Approx. time:** 30 – 40 minutes |  | **Key words / Topics:** * Probability
* Fraction
* Fruit
* Simplify
* Random
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| **Suggested Learning Outcomes**  |  |  |
| * To know how to calculate probability.
* To be able to calculate the probability of picking an item of fruit from a bag.
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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 probability, using the act of taking an item of fruit at random from a bag. |
| **Purpose of this activity**In this activity learners will develop understanding of the possible outcomes of simple random events. They will also understand that there is a degree of uncertainty about the outcome of some events. The teacher presentation shows a bag with a range of fruit inside. Learners will work on differentiated worksheets, which will allow them to progress from calculating the probability of individual fruits picked at random from a bag, to the probability of picking a fruit of a certain colour at random.This activity could be used as a main lesson activity, to teach learners how to work out and understand probability. Further number skills may be used to work out ratio and proportion. |
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| **Activity** |  | **Teacher notes** |
| **Introduction (10 minutes)**Teacher to explain that learners are going to look at probability by taking an item of fruit randomly from a bag. Using the presentation, teacher to explain how to calculate probability and the step-by-step calculation example of the probability of 4 apples.**Probability Worksheet 1 (15-20 minutes)**Handout probability worksheet 1. Learners to work out the probability of each type of fruit in the bag. Handout probability worksheet 2 as required to work out fruit combinations.**Discussing the results of the activity (5-10 minutes)**Class to compare their results, with peer review to identify the reasons for any differences in the calculated probabilities.  |  | This activity could be carried out as individuals or in small groups. **Probability Worksheets 1 and 2**Print the worksheets and distribute to the learners as required. The worksheets are progressive:* Worksheet 1 works out the probability for the fruit types.
* Worksheet 2 works out the probability for a combination of fruit colours.

The fruits are printed on the worksheets but to allow easy viewing the fruit page in the presentation could be displayed during the activity.As an alternative, actual bags containing a variety of fruit could be used. |
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| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| Teacher to demonstrate, step by step, how to work out the probability for each fruit type. |  | Learners create their own combinations of fruit and work out the probability. They could also calculate other probabilities (such as the probability that a learner chosen at random from the class is male) and compare these probabilities to others (such as the probability that a learner chosen at random from the school is male).Discuss how probability can be used to make predictions. |
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| * Printed worksheets 1 and 2.
* Pencils
* (optional) bag(s) of fruit
 |  | icon-ppt Practical Probability presentationicon-doc Practical Probability worksheets 1 and 2 |
| **Additional websites** |  |  |
| * **BBC Bitesize** – What is Probability?: <https://www.bbc.co.uk/bitesize/topics/z9fv4wx/articles/zjmjjhv>
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| **Related activities (to build a full lesson)** |  |  |
| **Starters** (Options) * Show the video: **BBC Bitesize** – What is Probability?: <https://www.bbc.co.uk/bitesize/topics/z9fv4wx/articles/zjmjjhv>
* Discuss how probability helps engineers predict what might go wrong with a product.
 | **Extension** (Options)* Learners create their own combinations of fruit and work out the probability. They could also calculate and compare other probabilities.
* Discuss how probability can be used to make predictions.

**Plenary*** Class to compare their results, with peer review to identify the reasons for any differences in the calculated probabilities.
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| **The Engineering Context** film |
| Probability is important to Engineers as it examines the likelihood of an event happening, so that risks can be reduced. For example, a Rail Engineer will test the train tracks for a new high-speed train to reduce the probability of failure. |

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| **Curriculum links** |
| **England: National Curriculum**MathsKS2 Year 6 – Information handlingIdeas of chance and uncertainty.* Calculates the probability and determines the expected occurrence of an event
 | **Northern Ireland Curriculum**KS2 NumberHandling Data – Introduction to Probability.* become familiar with and use the language of probability.
* understand possible outcomes of simple random events, understand that there is a degree of uncertainty about the outcome of some events while others are certain or impossible.
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| **Scotland: Curriculum for Excellence**Numeracy and mathematicsFractions, decimal fractions and percentages.* MNU 3-08a
 | **Wales: National Curriculum** Mathematics – Using data skillsProbability.* use numbers to describe the likelihood of an event, e.g. a one-in-six chance.
* recognise that some events are equally likely.
* identify the outcomes of simple events, e.g. flipping a coin, rolling a dice.
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| **Assessment opportunities** |
| * Formal teacher assessment of the worksheets.
* Informal teacher assessment and feedback during the activities.
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