Problem Solving in Mathematics

Handling Data

Forest Walk

Teacher Notes

Introduction

Pupils can work on this problem individually or with others.

- They can discuss how they will group the leaves together, for example using a tally/frequency table to identify how many of each leaf there is.
- They can discuss and determine how they will show this in a pictogram.
- They can decide on a suitable title and labels, and include the given key.
- They can compare their approach and adapt their own strategy if needed.
- They can use the table and/or pictogram to determine which leaf is the most common in the forest.

This problem deals with a pupil's ability to read through information, and then use this to produce and label a pictogram. They may use mental addition to determine the total in their tally/frequency table and use this as a checking mechanism to ensure no data is omitted. They will read and interpret information from tables and pictograms.

Please note: For pupils that require extra structure, there is a frequency table template and a pictogram template provided in the problem document.

What I know (think)

The pupils should know from the given problem:

- The pupils collected 30 leaves.
- A leaf identification chart has also been provided to help them group the leaves.
- A diagram of the leaves Matthew collected has been provided.

What I need to know (identify)

Pupils need to identify:

- how many of each leaf there is using the leaf identification chart;
- how they will record this information;
- how to produce a pictogram;
- which labels and title they will use to display the information in a pictogram; and
- the most common leaf in Matthew's sample.

Forest Walk (Continued)

What I need to do (employ)

Pupils should use the information they have been given and come up with appropriate steps to help them solve the problem, for example:

- They begin by identifying each leaf using the leaf identification table and record its name beside/underneath.
- They record how many of each leaf there is.
- Any pupil that requires structure to produce a frequency table should use the frequency table template (provided in the Problem).
- They check their calculations, either by using mental arithmetic or with pen and paper to ensure that they have recorded all 30 leaves accurately.
- They may discuss their findings with their peers and check as appropriate.
- They draw a pictogram to display their findings.
- Any pupil that requires structure to draw the pictogram should use the pictogram template (provided in the Problem). They can also use the leaf template along with the pictogram template if they need to.
- Pupils ensure that they record two of the collected leaves with just one leaf picture in their pictogram. (Two leaves = one picture)
- They ensure that they line up each leaf picture in their pictogram so that they are appropriately spaced for each type of leaf.
- They comment on the most and/or least common leaf in Matthew's sample.

What I did (review)

Pupils will use self-assessment, peer assessment or teacher feedback to decide whether they have approached the problem as intended.

- Did they correctly identify each leaf in the sample?
- Did they accurately identify how many of each leaf type there were?
- Did they total their tallies to get 30 – the number of leaves in Matthew's sample?
- Did they choose an appropriate title and labels?
- Did they correctly record the number of leaves collected using the leaf picture?
- Did they require help, and did they need to use the available templates?
- Did they correctly identify the least and/or most common leaf in the sample?

Forest Walk (Continued)

Curriculum Objectives

This problem should enable pupils to demonstrate their knowledge, understanding and skills through:

Developing pupils as Contributors to Economy and the Environment	**Explore how the skills developed through mathematics will be useful to a range of careers including those which analyse changes in the environment:** • Pupils gain an insight into how data is collected, recorded, displayed and interpreted to note a decline/ increase in a given species.

Thinking Skills and Personal Capabilities

This problem should enable pupils to demonstrate a variety of the following Thinking Skills and Personal Capabilities:

Managing Information	• Plan and set goals and break into sub-tasks • Select the most appropriate method for a task • Use a range of methods for collating, recording and representing information
Thinking, Problem-Solving and Decision Making	• Make connections between learning in different contexts • Generate possible solutions, try out alternative approaches and evaluate outcomes
Being Creative	• Experiment with ideas and questions • Learn from and value other people's ideas
Working with Others	• Listen actively and share opinions • Suggest ways of improving their approach to working collaboratively
Self-Management	• Seek advice when necessary • Compare their own approach with others' and in different contexts • Organise and plan how to go about a task

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Cross-Curricular Skills

This problem should enable pupils to demonstrate a variety of the following Cross-Curriculum Skills:

Using Mathematics