

SUBJECT: Science
GRADE: 4
DATE: June 2019
DURATION: 60 minutes
UNIT: Plants and Animals TOPIC: Functions of different plant parts - leaves
ATTAINMENT TARGET: <ul style="list-style-type: none"> • Recognise the variety of living things, their interdependence and their inter-relationship with the environment. • Gain an understanding of and apply aspects of the scientific method. • Begin to appreciate the influence and limitations of science. • Demonstrate a positive attitude towards the use of scientific language.
BENCHMARKS: <ul style="list-style-type: none"> • Devise and carry out a fair test in a familiar context. • Predict the outcomes of events based on their knowledge • Display curiosity, objectivity and perseverance in their approach to activities
SPECIFIC OBJECTIVES: <ul style="list-style-type: none"> • Identify and name a variety of common plants • Investigate the functions of different structures of plants (root and shoot systems) • Construct graphs and analyse data collected from investigations on plants • Make labelled drawings of the external parts of plants • Show concern by being responsible towards plants and animals • Show curiosity in exploring plants and animals in the surroundings
KEY SKILLS: Observing, record, report, construct graphs, analyse, create, communicate, collaborate, plan and design, draw conclusions,
KEY VOCABULARY: leaf, make food, shoot, leaf vein,
MATERIALS/RESOURCES: leaves of different colours and shapes, pencil, crayon, plain paper, marker, cartridge paper, scissors, glue, tape,
CONTENT OUTLINE: Leaves come in a variety of shapes and colours and form part of the shoot system of a plant. Leaves play an important role as they make food for the plants and other animals. Leaves contain a green substance which help them to use the light energy from the Sun to make food. Plants would eventually wither and die if they had no leaves.
PRIOR LEARNING: Check that students can: <ul style="list-style-type: none"> • Classify plants as living things • Describe the characteristics of living things

LEARNING OUTCOME: Students who demonstrate understanding can:

- Explain the functions of the basic structures of plants
- Make labelled drawings of the external parts of flowering plants
- Appreciate the need to care for plants

ASSESSMENT CRITERIA:

- Accurate observations noted
- Observation Sheet contains accurate information
- Correct mathematical shapes identified
- Leaf impressions are neat and accurate
- Investigation plans reflect a fair test
- Conclusions supported by evidence

PROCEDURES/ACTIVITIES

Engage - *How can I get students interested in this?* Use of an interesting picture. (15 min)

- Students will participate in a Nature Walk. They will collect leaves from different plants (or use phone/ tablets to *take pictures*), noting the name of plant and the number of leaves observed on each plant examined. The information collected will be recorded on the Observation Sheet provided.
- Students will be asked to handle plants with care and why this is important.
- *Teacher will clarify any misconceptions and direct students to form groups to carry out the next activity.*

Explore - *What tasks/questions can I offer to help students puzzle through this?* Use of a simple investigation. (15 min)

- In groups, students will carefully examine samples or *pictures* of the leaves collected, noting their colour and shape. Students will use a magnifying glass to note the structure of the leaf. *These structures will be identified as veins and midrib.*
- Students will make leaf impressions in their notebook by placing a piece of paper over a leaf and rubbing with a pencil or crayon to make an outline of the leaf.
- *Teacher will assess how each group is carrying out the activity and offer guidance as needed.*

Explain - *How can I help students make sense of their observations?* Class presentation and discussions. (15 min)

- Leaf impressions will be placed on charts/ posters for display in the class. Students can also arrange pictures taken for presentation using poster or PowerPoint.
- Students will present their posters and discuss the different leaf shapes and colours. The leaves will be categorized using *mathematical shapes*. Students will recall the function of leaves and will suggest why leaves are important to plants. Poster will be assessed using a teacher-prepared rubric.

- *Teacher notes information presented by students on the board and offers clarifications of any misconceptions held and provides additional information to students.*

Elaborate - *How can my students apply their new knowledge to other situations? Application of what they learned. (10 min)*

- Students will use information on the Observation Sheet to construct graphs showing the number of leaves present on different plants (or use Microsoft Excel to generate graphs)
- Students will be introduced to a scenario where two similar plants are presented (or using pictures). One with leaves and the other without. Students will predict what would happen to the plant without leaves. Students will plan an investigation to determine the function of leaves. Students will discuss what will make it a fair test and present plans to the teacher.
- Students will carry out the investigation over a *number of weeks* and present their findings using spreadsheets/ graphs. Students will make conclusions as to the importance of leaves to plants.
- *Teacher offers guidance during the process of planning the investigation and instructs students to use the Designing Investigation Template. Misconceptions will be clarified by the teacher. The need for proper care of plants will be highlighted and discussed.*

Evaluate - *How can I help my students self-evaluate and reflect on the teaching and learning, and how can I evaluate the students learning of concepts and skills. Assessment (10 min)*

- Leaf poster will be assessed using a teacher-prepared rubric.
- Observation Sheet will be assessed for accurate observations and information.
- Plans for investigation will be assessed to determine if they reflect a fair test.
- Bar Graphs constructed using data from the Nature Walk will be assessed for correct labelling and display of information.

EXTENDED LEARNING: Students will use Internet to research plants which do not have leaves and determine how the plant makes food for itself.

LINKS TO OTHER SUBJECTS:

- Visual Arts, Mathematics

POST-LESSON REFLECTION:

Activity 1: Plants and their leaves

Aim: To determine the number of leaves on plants in the school environment

Skills: Observing, manipulating, calculating, collaborating

What you will do:

Go on a Nature Walk in your school yard.

Explore the environment and note the names of plants and the number and colour of their leaves.

Complete the Observation Sheet below.

Observation Sheet

Plant Name	Number of leaves	Colour of leaves	Shape of leaves

Questions:

1. What number of leaves is most common on plants?
2. Which is the most popular leaf colour?
3. Which leaf shape is the most common?

4. Use the information to construct bar graphs when instructed by your teacher.