Life Science

Grade 3

Written by Tracy Bellaire

The experiments in this book fall under ten topics that relate to two aspects of life science: **Needs and Characteristics of Living Things; and Exploring the Senses**. In each section you will find teacher notes designed to provide you guidance with the learning intention, the success criteria, materials needed, a lesson outline, as well as provide some insight on what results to expect when the experiments are conducted. Suggestions for differentiation are also included so that all students can be successful in the learning environment.

Tracy Bellaire is an experienced teacher who continues to be involved in various levels of education in her role as Differentiated Learning Resource Teacher in an elementary school in Ontario. She enjoys creating educational materials for all types of learners, and providing tools for teachers to further develop their skill set in the classroom. She hopes that these lessons help all to discover their love of science!

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At A Glance

Learning Intentions

Learning Intentions	Plants	Plant Parts	What Do Plants Need?	How Plants Grow	Importance of Plants	Aboriginal People and Plants	Growing Plants for Food	Invertebrates	Birds	Fish, Reptiles, Amphibians	Mammals
Knowledge and Understanding Content											
Recognize what a plant is and describe their physical characteristics	•	•									
Identify the main parts of a plant and explain their functions in helping a plant survive		•									
Conduct experimental inquiries to determine the basic needs of plants to grow healthy			•								
Investigate and describe seed germination, plant maturation, and special adaptations that help them survive				•							
Recognize the role plants play as a source of food energy for living things; construct a plant growing environment					•						
Describe the importance of some plants and their usage by First Nation's people						•					
Identify the ways plants are grown for food, recognizing the advantages and disadvantages of organically grown food, and describing harvesting methods of plants							•				
Research and describe the physical characteristics and behaviors of invertebrates								•			
Research and describe the physical characteristics and behaviors of birds									•		
Describe the physical characteristics of fish, reptiles, and amphibians; research to learn more about their life cycles										•	
Identify different mammals and describe their physical characteristics; research to learn more about a mammal											•
Thinking Skills and Investigation Process											
Make predictions, formulate questions, and plan an investigation		•	•	•	•						
Gather and record observations and findings using drawings, tables, written descriptions	•	•	•	•	•	•	•	•	•	•	•
Recognize and apply safety procedures in the classroom	•	•	•	•	•	•	•	•	•	•	•
Communication											
Assess different ways in which plants are important in the lives of people and other living things					•	•					
Application of Knowledge and Skills to Society and the Environment											
Assess different ways in which plants are important in the lives of people and other living things					•	•					
Assess the harmful effects plants face and determine how to minimize these effects, including a personal action plan					•						

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Teacher Assessment Rubric

Student's Name: _____ Date: _____

Success Criteria	Level 1	Level 2	Level 3	Level 4
Knowledge and Understanding Content				
Demonstrate an understanding of the concepts, ideas, terminology definitions, procedures and the safe use of equipment and materials	Demonstrates limited knowledge and understanding of the content	Demonstrates some knowledge and understanding of the content	Demonstrates considerable knowledge and understanding of the content	Demonstrates thorough knowledge and understanding of the content
Thinking Skills and Investigation Process				
Develop hypothesis, formulate questions, select strategies, plan an investigation	Uses planning and critical thinking skills with limited effectiveness	Uses planning and critical thinking skills with some effectiveness	Uses planning and critical thinking skills with considerable effectiveness	Uses planning and critical thinking skills with a high degree of effectiveness
Gather and record data, and make observations, using safety equipment	Uses investigative processing skills with limited effectiveness	Uses investigative processing skills with some effectiveness	Uses investigative processing skills with considerable effectiveness	Uses investigative processing skills with a high degree of effectiveness
Communication				
Organize and communicate ideas and information in oral, visual, and/or written forms	Organizes and communicates ideas and information with limited effectiveness	Organizes and communicates ideas and information with some effectiveness	Organizes and communicates ideas and information with considerable effectiveness	Organizes and communicates ideas and information with a high degree of effectiveness
Use science and technology vocabulary in the communication of ideas and information	Uses vocabulary and terminology with limited effectiveness	Uses vocabulary and terminology with some effectiveness	Uses vocabulary and terminology with considerable effectiveness	Uses vocabulary and terminology with a high degree of effectiveness
Application of Knowledge and Skills to Society and Environment				
Apply knowledge and skills to make connections between science and technology to society and the environment	Makes connections with limited effectiveness	Makes connections with some effectiveness	Makes connections with considerable effectiveness	Makes connections with a high degree of effectiveness
Propose action plans to address problems relating to science and technology, society, and environment	Proposes action plans with limited effectiveness	Proposes action plans with some effectiveness	Proposes action plans with considerable effectiveness	Proposes action plans with a high degree of effectiveness

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Student Self Assessment Rubric

Name: _____ Date: _____

Put a check mark ✓ in the box that best describes you:

	Always	Almost Always	Sometimes	Needs Improvement
I am a good listener.				
I followed the directions.				
I stayed on task and finished on time.				
I remembered safety.				
My writing is neat.				
My pictures are neat and colored.				
I reported the results of my experiment.				
I discussed the results of my experiment.				
I know what I am good at.				
I know what I need to work on.				

1. I liked _____

_____

2. I learned _____

_____

3. I want to learn more about _____

_____

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INTRODUCTION

The activities in this book have two intentions: to teach concepts related to life science and to provide students the opportunity to apply necessary skills needed for mastery of science and technology curriculum objectives.

Throughout the experiments, the scientific method is used. The scientific method is an investigative process which follows five steps to guide students to discover if evidence supports a hypothesis.

1. **Consider a question to investigate.**
   For each experiment, a question is provided for students to consider. For example, "Can a plant live and grow without sunlight?"

2. **Predict what you think will happen.**
   A hypothesis is an educated guess about the answer to the question being investigated. For example, "I believe that a plant will grow faster in the sunlight". A group discussion is ideal at this point.

3. **Create a plan or procedure to investigate the hypothesis.**
   The plan will include a list of materials and a list of steps to follow. It forms the "experiment".

4. **Record all the observations of the investigation.**
   Results may be recorded in written, table, or picture form.

5. **Draw a conclusion.**
   Do the results support the hypothesis? Encourage students to share their conclusions with their classmates, or in a large group discussion format.

The experiments in this book fall under eleven topics that relate to two aspects of life science: **Growth and Changes in Plants**; **and Animal Life Cycles.** In each section you will find teacher notes designed to provide you guidance with the learning intention, the success criteria, materials needed, a lesson outline, as well as provide some insight on what results to expect when the experiments are conducted. Suggestions for differentiation are also included so that all students can be successful in the learning environment.

Assessment and Evaluation:

Students can complete the Student Self-Assessment Rubric in order to determine their own strengths and areas for improvement. Assessment can be determined by observation of student participation in the investigation process. The classroom teacher can refer to the Teacher Assessment Rubric and complete it for each student to determine if the success criteria outlined in the lesson plan has been achieved. Determining an overall level of success for evaluation purposes can be done by viewing each student's rubric to see what level of achievement predominantly appears throughout the rubric.

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PLANTS

Learning Intention:

Students will learn about what a plant is, and about their physical characteristics.

Success Criteria:

- recognize a variety of plants in your neighborhood
- compare a variety of plants according to their physical characteristics
- identify the main physical characteristics of a plant
- describe the function of each of the main parts of a plant
- research a plant to determine its name, type, and label its parts

Materials Needed:

- a copy of "What is a Plant?" worksheets 1 and 2 for each student
- a copy of "Plants in My Neighborhood" worksheet 3 for each student
- a copy of "The Sum of All Parts" worksheets 4 and 5 for each student
- a copy of "Pick a Plant, Any Plant!" worksheet 6 for each student
- iPods or iPads *(optional)*
- 5 or 6 assorted plants, soil, and planters
- access to the internet or local library
- chart paper, markers, pencil crayons, clipboards, pencils

Procedure:

***This lesson can be done as one long lesson, or can be done in four or five shorter lessons.**

1. Using worksheets 1 and 2, do a shared reading activity with the students. This will allow for reading practice and breaking down word parts to read the larger words. Along with the content, discussion of vocabulary words would be of benefit for their comprehension.

   Some interesting vocabulary words to focus on are:

   - categorized
   - flexible
   - rely
   - erosion
   - biennial
   - coniferous
   - herbs
   - water conditions
   - shed
   - annual
   - deciduous
   - herbaceous
   - soil conditions
   - bogs
   - perwial

2. Give students worksheet 3, a clipboard and a pencil. Take them out into the neighborhood to look for different kinds of plants. Encourage students to notice the types of trees, shrubs, grasses, flowered plants, etc. that are growing locally. *An option is to give students iPods or iPads to take photos of the different vegetation that they see.*
3. Display 5 or 6 assorted plants (roots exposed). Engage students in a discussion about the physical characteristics of each plant type. How are they different? What do they all have in common? Ask students to look back at the plants that they drew on worksheet 1 (or have taken photos of). How are they different? How are they the same? (Some common characteristics that should be noted are that all plants have a root system, stem, leaves. They differ in size, shape, color, and some have flowers).
4. Divide students into pairs. Give them worksheet 4. They will engage in a "think-pair-share" activity to discuss and then record answers to the questions on the worksheet. A follow up option is to come back together as a large group to share responses. Student responses could be recorded on chart paper and displayed in the classroom for future reference.

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5. Give students worksheet 5. Read through with the students about the main parts of a plant and each of their purposes. Along with the content, discussion of certain vocabulary words would be of benefit to ensure students' understanding of the concepts.

   Some interesting vocabulary words to focus on are:

   - chlorophyll
   - absorb
   - anchor
   - attract
   - pollinate
   - minerals
   - nutrients
   - supports

6. Students will choose one plant that they drew on Worksheet 1 that they would like to know more about. Using Worksheet 6, and with access to the internet or local library, they will provide more detail about the plant that they chose.

Differentiation:

Slower learners may benefit by working in a small group with teacher support to orally answer the questions on Worksheet 4. Group responses could be recorded by teacher on chart paper and later shared with the large group. An additional accommodation would be for these learners to be partnered with a strong peer to complete Worksheet 6. They could choose one plant from either of their first worksheet to research.

For enrichment, faster learners could plant and care for the 5 or 6 assorted plants (used in item #3). They could chart their growth by measuring the plants' heights, or amount of flower production each has. This could be done by creating a simple bar graph.

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Worksheet 1 Name:

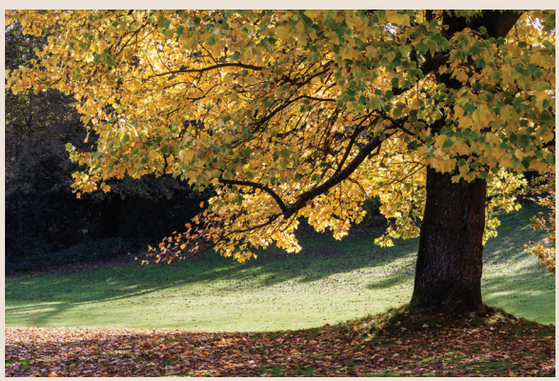
What is a Plant?

There are many different kinds of plants in our world. Every plant can be categorized as either being a tree, a bush or shrub, a weed, a vine, moss, or a herbaceous plant. Plants grow on land or in the water.

Trees are usually the tallest of all plants. They grow on one thick stem, which is called a trunk, with many leaves and branches. They grow in almost all kinds of soil and water conditions. Trees are perennials. This means that their life cycle is longer than three years.

Did you know that a tree grows a new layer on the outside of its trunk every year? If you count a tree's rings, you can find out how old it is.

Some trees are deciduous and some trees are coniferous. Deciduous trees lose their leaves as the cold season approaches, and they grow new leaves when the warm weather returns. Coniferous trees keep their leaves or needles, and shed only the oldest leaves or needles throughout the year.



Oak, maple, and elm are examples of tree types that are deciduous.

Pine, cedar, and spruce are examples of tree types that are coniferous.

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Bushes and shrubs are also perennials. They are usually much shorter than trees and have many woody stems.

A rose bush is a deciduous bush that goes into a winter sleep called dormancy when the frost comes.

Some bushes and shrubs are deciduous and some are coniferous. They are usually planted to help stop soil erosion and are very popular in gardens and parks.

Mosses are tiny plants that grow on rocks, soil, on the bark of trees, in streams and in bogs. They have small stalks and leaves. They do not have true roots and rely on water for survival.

Vines are weak-stemmed, flexible plants that rely on other plants for support. They often wind around branches and other objects to hold themselves up. Vines can be deciduous or coniferous and may flower or bear fruit.

Herbaceous plants are mainly flowering plants. This group includes herbs, grasses, vegetable plants, and flowers that are usually planted in gardens.

Some herbaceous plants are annuals, which last only one growing season. Some are biennials, which last two growing seasons. Some are perennials, which last longer than three growing seasons.

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Worksheet 3

Name:

Plants in My Neighborhood

Have you ever noticed what kinds of plants are in your neighborhood?

Take a walk around your neighborhood. In the box below, draw and label the plants that you see.

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Worksheet 4 Name:

The Sum of All Parts

Think Pair Share

With a partner, do some thinking and sharing of ideas about the questions below. Record your ideas.

"What does a plant use its roots for?"

"What does a plant use its stem for?"

"What does a plant use its leaves for?"

"What does a plant use its flowers for?"

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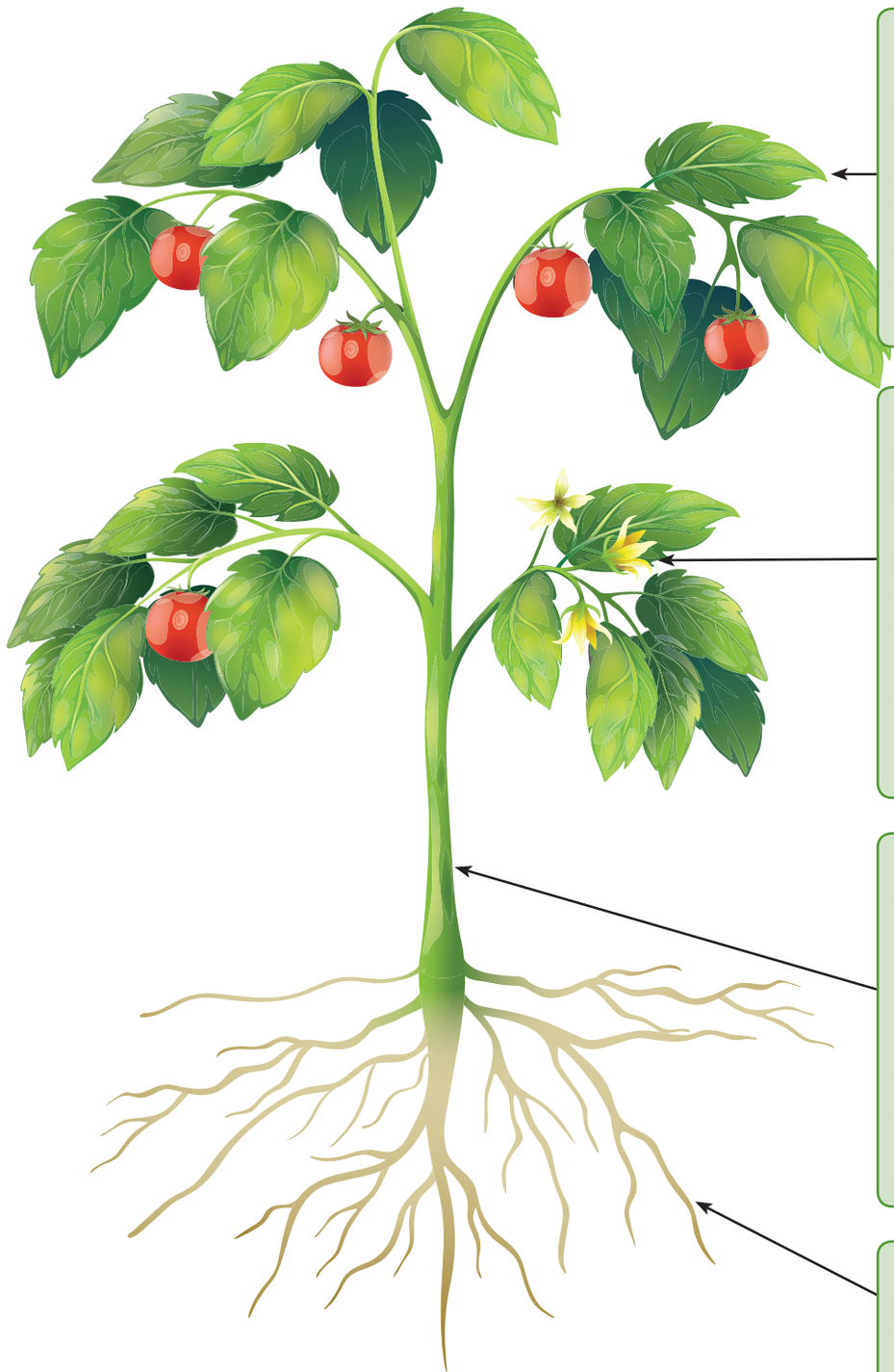
Name:

Fast Facts!



Leaves use energy from the sun to mix with their chlorophyll to make a sugar from the air. The sugar, air, and water that the plant takes in, makes food for it.

When flowers are pollinated, they produce fruit. Colorful flower petals attract animals and insects that help to pollinate the flowers. Flowers also make seeds that are needed to start new plants.

A stem of a plant supports it. The stem grows leaves that make food for the plant. The stem stores the food. The stem carries water and nutrients to other parts of the plant.

The roots anchor the plant to the ground. The roots of a plant absorb water and minerals that the plant needs to grow.

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Name:

Pick a Plant, Any Plant!

Choose a plant that you saw in your neighborhood, and that you drew on Worksheet 1. Access the internet or visit your local library to help you answer these questions about this plant.

1. What is the name of this plant?

   _____

2. What type of plant is it? (circle one)

   tree shrub/bush moss vine herbaceous plant

3. Is this plant deciduous or coniferous?

   _____

4. Is this plant an annual, a biennial, or a perennial?

   _____

5. Draw your plant. Label its parts.

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