

Integrating Science and Technology
and
Catholic Curriculum Maps

Grade 3

Understanding Life Systems Strand

Growth and Changes in Plants



**Catholic Curriculum Corporation
Central and Western Region**

November, 2008

**Understanding Life Systems Strand
Grade 3**

Unit At-A-Glance

<p>Catholic Social Teaching: Community and the Common Good Essential Question: Who is the Holy Spirit? OCSGE: The graduate is a responsible citizen who respects the environment and uses resources wisely. (7i) Integrates faith with life. CGE 1i</p>	
<p>Topic: Growth and Changes in Plants Students will observe, investigate and discover that plants have distinctive characteristics; plants have similarities and differences; plants are a primary source of food for humans; humans need to protect plants and their habitats, and plants are important to the planet.</p>	
<p>Unit Guiding Question: Why are all plants in God’s creation important and what are our responsibilities toward them?</p>	
<p>Unit Culminating Task: Students will collect and germinate seeds to create a classroom garden of wildflowers. The students will complete activities which will build a Research Report: My Wildflower, reflecting upon the unit guiding questions:</p> <ul style="list-style-type: none"> • Why are all plants in God’s creation important and what are our responsibilities toward them? 	
Essential Understandings	
<p>Catholic Curriculum Map: Essential Question(s)</p>	<p>How does the Holy Spirit work in my life? Who am I? What type of relationships do I have?</p> <ul style="list-style-type: none"> • Understands that the Holy Spirit inspires us to share in the mission of Jesus • Recognize and share the talents that God has given us and others • Appreciate the value of care and effort in our work • Discover our responsibility to care for the earth and one another
<p>Science and Technology: Fundamental Concept(s)</p>	<p>Sustainability and Stewardship and Systems and Interactions</p>
<p>Science and Technology: Big Ideas and Overall Expectations</p>	<ul style="list-style-type: none"> • Plants have distinct characteristics (OE 2, 3) • There are similarities and differences among various types of plants (OE 2) • Plants are the primary source of food for humans (OE 1) • Humans need to protect plants and their habitats (OE 1) • Plants are important to the planet (OE 1)
<p>Science and Technology: Scientific Inquiry Skill</p>	<p>Experiment, Research</p>
<p>Science and Technology: Expectation Tags, Guiding Questions and Specific Expectations</p>	<p>Relating Science and Technology to Society and the Environment</p> <ul style="list-style-type: none"> • How are plants important to humans and other living things? (SE 1.1) • We are responsible for the care of the earth. How does human activity impact plants and how can we minimize harmful affects to the environment? (SE 1.2)

**Understanding Life Systems Strand
Grade 3**

	<p>Developing Investigation and Communication Skills</p> <ul style="list-style-type: none"> • Follow established safety procedures during science investigations (SE 2.1) • Observe and compare the parts of various plants (SE 2.2) • Germinate seeds, record similarities and differences as seedlings develop (SE 2.3) • Use scientific research to answer the following questions: How do plants meet their needs for air, water, light, warmth and space? What are different ways in which we can help plants meet their needs? (SE 2.5) • Use appropriate vocabulary (stem, leaf, root, pistil, stamen, flower, adaptation and germination) in oral and written communication (SE 2.6) <p>Understanding Basic Concepts</p> <ul style="list-style-type: none"> • Describe the basic needs of plants, including air, water, light, warmth, space (SE 3.1) • Identify the major parts of a plant (SE 3.2) • Describe how most plants get energy to live directly from the sun and how plants help other things get energy. (SE 3.4) • Describe ways in which humans use plants for food, shelter, medicine and clothing (SE 3.5) • Describe ways in which plants and animals depend on each other (SE 3.6)
--	---

Unit Overview

NOTE: Teachers will need to adjust the suggestions to address the learning needs of their students.

Subtask	Lesson / Time	Essential Understandings	Assessment	Resources
1	<p>Introduction of Unit</p> <p>1.1 God’s Creation and Plants (40 minutes)</p> <p>1.2 Called to Care for God’s Creation (40 minutes)</p>	<p>Understands that the Holy Spirit inspires us to share in the mission of Jesus</p> <p>Appreciate the value of care and effort in our work</p> <p>Discover our responsibility to care for the earth and one another</p> <p>Humans need to protect plants and their habitats; Plants are important to the planet (OE 1)</p> <p>SE 1.2</p>	<p>Observation, oral feedback, student written responses in “GROWING GREEN” Scientific Journals</p>	<p>Bible, a “Creation Story” (e.g. <i>The Everything Seed A Story of Beginnings</i> by Carole Martignacco, Chart Paper and markers, “GROWING GREEN” Scientific Journals (Use the ½ and ½ notebooks so there is room for diagrams and printing), prayer table and plant, clear plastic glasses, paper towels and bean seeds</p>

**Understanding Life Systems Strand
Grade 3**

<p>2</p>	<p>Learning About Plants</p> <p>2.1 Kinds of Plants and Where they Grow (40 minutes)</p> <p>2.2 Looking at Flowering Plants and its Parts (40 minutes)</p> <p>2.3 Needs of Plants (40 minutes but observations over a period of days)</p>	<p>Discover our responsibility to care for the earth and one another</p> <p>Plants have distinct characteristics (OE 2, 3) There are similarities and differences among various types of plants (OE 2)</p> <p>SE 2.1,2.12.5,2.6,3.1,3.2</p>	<p>Observation, oral feedback, student written responses in “GROWING GREEN” Scientific Journals , BLM completion</p>	<p>Bible, Chart Paper and markers, plant, magazines and multiple sources for gathering and cutting out a variety of plants, and “GROWING GREEN” Scientific Journals, bean seeds, paper towels, jars and water, Word Wall, BLM 2.2, BLM 2.3</p>
<p>3</p>	<p>How do Plants Grow?</p> <p>3.1 Planting Wildflower Seeds (40 minutes)</p> <p>3.2 What is Photosynthesis? (40 minutes)</p> <p>3.3 What is Germination? (40 minutes)</p>	<p>Understand that the Holy Spirit inspires us to share in the mission of Jesus Recognize and share that talents that God has given us and others Appreciate the value of care and effort in our work</p> <p>Plants have distinct characteristics (OE 2, 3)</p> <p>SE 1.2, 2.1,2.3,2.5,2.6,3.4</p>	<p>Observation, following directions, oral feedback, student written responses in “GROWING GREEN” Scientific Journals</p>	<p>Chart Paper and markers, a Grade 3 Science Text, “GROWING GREEN” Scientific Journals, seeds, soil, jars, Word Wall, BLM 3.1a) and 3.1b)</p>
<p>4</p>	<p>Why are Plants Important?</p> <p>4.1 Uses of Plants (40 minutes)</p> <p>4.2 Interdependence of Plants and Animals (40 minutes)</p>	<p>Understand that the Holy Spirit inspires us to share in the mission of Jesus Appreciate the value of care and effort in our work Discover our responsibility to care for the earth and one another</p> <p>Plants have distinct characteristics (OE 2, 3) There are similarities and differences among various types of plants (OE 2) Plants are the primary source of food for humans (OE 1) Humans need to protect plants and their habitats (OE 1)</p>	<p>Observation, oral feedback, student written responses in “GROWING GREEN” Scientific Journals</p>	<p>An age-appropriate “Spiritual/Environmental” book (e.g. <u>The Giving Tree</u> by Shel Silverstein), Chart Paper and markers, a Grade 3 Science Textbook, “GROWING GREEN” Scientific Journals, Word Wall, BLM 4.1 and 4.2</p>

**Understanding Life Systems Strand
Grade 3**

		Plants are important to the planet (OE 1) SE 1.1, 3.5, 3.6, 3.8		
5	Culminating Performance Task 5.1 Research Report on My Wildflower (3 x 40 minutes)	<p>Appreciate the value of care and effort in our work Discover our responsibility to care for the earth and one another</p> <p>Plants have distinct characteristics (OE 2, 3) There are similarities and differences among various types of plants (OE 2) Plants are important to the planet (OE 1)</p> <p>SE 1.1, 1.2, 2.6, 3.2,3.3</p> <p>Language Reading Identify a variety of text features and explain how they help readers understand texts Writing Sort ideas and information for their writing in a variety of ways Gather information to support ideas for writing in a variety of ways and/or a variety of sources Write short text using a variety of forms (e.g. Informational report, journal entry, labelled diagram, experiment)</p>	Observation, oral feedback, student written responses in “GROWING GREEN” Scientific Journals, Rubric, Research Report	Research materials and reference books, “GROWING GREEN” Scientific Journals, BLM 5.1 and BLM which has been used to record data during the project

Understanding Life Systems Strand Grade 3

Subtask 1: Introduction to the Unit

Six Days of Creation and the Sabbath

God blessed them, and God said to them, "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth. God said, "See I have given you every plant yielding seed that is upon the face of all the earth, and every tree with seed in its fruit; you shall have them for food. And to every beast of the earth, and to every bird of the air, and to everything that creeps on the earth, everything that has the breath of life, I have given every green plant for food. And it was so. God saw everything that he had made, and indeed, it was very good. And there was evening and there was morning, the sixth day. Thus the heavens and the earth were finished, and all their multitude. And on the seventh day God finished the work that he had done, and he rested on the seventh day from all the work that he had done. So God blessed the seventh day and hallowed it, because on it God rested from all the work that he had done in creation.

Genesis 1: 28 - 2: 3

Description

Through a Bible story students will explore the wonder of God's creation and how we are called to take care of plants in our world.

Lesson 1.1 Introduction to the Unit

Purpose

Students will respond to the creation story by sharing what they know about living things, especially plants.

Essential Understandings

Catholic Curriculum Map Links:

- Understands that the Holy Spirit inspires us to share in the mission of Jesus
- Appreciate the value of care and effort in our work
- Discover our responsibility to care for the earth and one another

Science and Technology:

- How do humans provide and care for an appropriate and healthy environment? (SE 1.2)

Assessment for Learning

Use observation to identify student's ability to orally contribute to sharing.

Provide feedback to students to ensure their understandings are accurate.

Use assessment information to identify the need for individual, small group and whole group instruction.

Use the "GROWING GREEN" Scientific Journals to evaluate their learning

Teacher Notes

This lesson connects to the Grade 3 Religion and Family Life program, Unit 3 ITSWB –Understand that the Holy Spirit inspires us to share in the mission of Jesus; Unit 7 ITSWB – Discover our responsibility to care for the earth and one another; FA 1.1, 1.5, 5.1 – Recognize and share the talents and gifts that God has given us; FA 5.3 – Appreciate the value of care and effort in their work.

Planting bean seeds in Lesson 1.1 is a key activity in preparation for Lesson 2.3 Learning about the Needs of Plants. Soaking bean seeds in water the night before planting is also helpful for rooting.

Understanding Life Systems Strand Grade 3

Materials- Bible, a “Creation Story” (e.g. *The Everything Seed A Story of Beginnings* by Carole Martignacco, Chart Paper and markers, “GROWING GREEN” Scientific Journals (Use the ½ and ½ notebooks so there is room for diagrams and printing), prayer table and plant, plastic cups, bean seeds, paper towels and water

Instruction

Time to Teach

- Teacher will gather the students around the prayer table and introduces the Unit with the unit guiding questions, “Why are all plants in God’s Creation important and what are our responsibilities toward them?” All the children to share their responses to the two questions. Record their ideas on chart paper.
- Teacher reads aloud the Bible scripture reading on Creation and asks the students to listen for all the things God created but especially what was said about plants and on which day God created them. Write the key phrase on chart paper: “See I have given you every plant yielding seed that is upon the face of all the earth, and every tree with seed in its fruit; you shall have them for food.” and “I have given every green plant for food.” Day 6 of Creation
- Teacher further introduces the unit by explaining that through the Essential Understandings we will learn more about God’s gift of plants to our world and our responsibility to care for them. As the Culminating Task students will do a Research Report: My Wildflower
- Teacher will ask the students to assist her in planting some bean seeds in plastic cups, explaining that they will be used in an experiment in a later lesson. Instructions: Wet paper towels thoroughly and line inside 6 clear plastic cups. In five cups plant one bean seed on each side of the cup (two per cup) but in the sixth cup plant 20 or more seeds in the cup.
- Teacher introduces the “GROWING GREEN” Scientific Journals

Time to Practice

- Students use think-pair-share to respond to the unit guiding questions
- Students use think-pair-share to respond to the “Creation Story” and the questions.
- Students will begin working in the “Growing Green” Scientific Journal by making a title page to reflect the Creation story showing the various components of God’s creation, including Plants

Time to Share

- Students share their pictures of Creation
- The class will gather at the prayer table and say a short prayer of thanksgiving: Creator God, we give you thanks for the many gifts you have given us. We thank you for the gift of plants and we ask you to bless us as we study and learn more about them. Help us to take good care of the plants in our world. We ask this in your name. Amen

Understanding Life Systems Strand Grade 3

Lesson 1.2 Called to Care for God's Creation

Purpose

Students will review the creation story and the sharing from Lesson 1.1. Reflect upon how we are called to be responsible for the care of the earth and all living things. Students will be asked to write a reflection in their "GROWING GREEN: Scientific Journals.

Essential Understandings

Catholic Curriculum Map Links:

- Understands that the Holy Spirit inspires us to share in the mission of Jesus
- Appreciate the value of care and effort in our work
- Discover our responsibility to care for the earth and one another

Science and Technology:

- How do humans provide and care for an appropriate and healthy environment? (SE 1.2)

Assessment for Learning

Use observation to identify student's ability to orally contribute to sharing.

Provide feedback to students to ensure their understandings are accurate.

Use the "GROWING GREEN" Scientific Journals to evaluate their learning

Teacher Notes

This lesson connects to the Grade 3 Religion and Family Life program, Unit 3 ITSWB –Understand that the Holy Spirit inspires us to share in the mission of Jesus; Unit 7 ITSWB – Discover our responsibility to care for the earth and one another; FA 1.1, 1.5, 5.1 – Recognize and share the talents and gifts that God has given us; FA 5.3 – Appreciate the value of care and effort in their work.

Materials- Bible, a "Creation Story" (e.g. *The Everything Seed A Story of Beginnings* by Carole Martignacco, Chart Paper and markers, "GROWING GREEN" Scientific Journals (Use the ½ and ½ notebooks so there is room for diagrams and printing), prayer table and plant

Instruction

Time to Teach

- Teacher will gather the students around the prayer table and again share the short prayer of thanksgiving: Creator God, we give you thanks for the many gifts you have given us. We thank you for the gift of plants and we ask you to bless us as we study and learn more about them. Help us to take good care of the plants in our world. We ask this in your name. Amen
- Ask the children to recall the creation story. What do they remember from yesterday's story?
- Review the Guiding Questions: Why are all plants in God's creation important and what are our responsibilities toward them? Reread the answers recorded on the chart yesterday. Ask the students to think of ways in which we show we care about plants? (in our school yard, in our homes and yards, in the parks, in the forest, etc.) Ask why it is important that we care for plants? (beauty, shade, homes for animals, wood to build things, food, etc.) How can we show we are responsible? (plant new trees, care for the soil, give plants water, don't destroy plants, etc.)
- Invite the students to examine the changes to the bean seeds and chart observations

Understanding Life Systems Strand

Grade 3

Time to Practice

- Students are to respond orally to the review questions on creation and the unit guiding questions
- After whole class discussion students will write answers in the “GROWING GREEN” Scientific Journal to the following prompts:
 - I know all plants in God’s creation are important because....
 - I show I am responsible and care for plants when I
- Students who finish early can go to the area where there are magazines and begin to cut out various examples of different kinds of plants for Subtask 2.1

Time to Share

- Students share their answers to the prompts with the class.

Understanding Life Systems Strand Grade 3

Subtask 2: Learning about Plants

The works of God in Nature

Now will I recall God's works; what I have seen, I will describe. At God's Word, were His works brought into being; they do His Will as He has ordained them. As the rising sun is clear to all, so the glory of the Lord fills all His works. **Sirach 42:15**

Description

Students will learn about that in Creation there are many kinds of plants based on their unique characteristics and where they live. Students will look at one type of plant, a flowering plant, to identify its parts and purposes, and examine the needs of plants.

Lesson 2.1 Kinds of Plants and Where they Grow

Purpose

Students will sort various pictures of plants and try to group them according to their unique characteristics and where they might grow.

Essential Understandings

Catholic Curriculum Map Links:

- Discover our responsibility to care for the earth and one another

Science and Technology:

- Follow established safety procedures during science investigations (SE 2.1)
- Observe and compare the parts of various plants (SE 2.2)

Assessment for Learning

Use observation to identify student's ability to identify and sort kinds of plants based on their distinctive characteristics. Students will demonstrate their understanding by working in groups to create charts of similarities and differences of plants and predict where they grow.

Review charts to monitor small group understanding of activity.

Use the "GROWING GREEN" Scientific Journals to evaluate their learning.

Teacher Notes

This lesson will engage students in cutting out various pictures of plants and then sorting them based on their distinctive characteristics. Students will demonstrate their understanding by working in groups to create charts of similarities and differences of plants and predict where they grow. Individually they will record an example in their "GROWING GREEN" Scientific Journals

Materials – a Bible, Chart Paper and Markers, Grade 3 Science Textbook, pictures and magazines, and "GROWING GREEN" Scientific Journals, Word Wall

Instruction

Time to Teach

- Share the biblical quote from Sirach and pose the question: When God created all things, God created many varieties of plants. What do you think God wants us to do to care for all the different plants? What will happen to the plants if we don't care for them?

Understanding Life Systems Strand

Grade 3

- Ask the student to share the various pictures of plants that they have collected. Teacher asks the question, “What are the basic characteristics of most of the plants in the pictures?” Record information on a chart (e.g. roots and stems, reproduce, store and release energy, made up of cells, they are green, need light and water, they grow, they bloom, etc.)
- The teacher will ask the students to look at the pictures and group them according to similarities and differences (e.g. Flowering and Non-flowering) and have each small group divide a chart into two sections and paste the pictures under the headings
- Ask the students to predict where the various plants might grow (garden, meadows, forest, dessert, marshland, riverbank, farm, wetlands, orchards, etc.)
- Invite the students to examine the changes to the bean seeds and chart observations. Introduce the words roots, root hairs and germination when appropriate and add to the Word Wall.

Time to Practice

- Students will record responses to the following sentence starters in their “GROWING GREEN” Scientific Journals:
 - Plants are alike because
 - Some plants are different because
 - Draw a picture of a plant. Identify if it is flowering or non-flowering and tell where your plant grows.

Time to Share

- Students will display the charts developed in small group and provide a sorting rule.
- Individual students will share some examples of what they recorded in their “GROWING GREEN” Scientific Journals

Understanding Life Systems Strand Grade 3

Lesson 2.2 Looking at Flowering Plants and its Parts

Purpose

Students will examine various flowering plants and identify its parts.

Essential Understandings

Catholic Curriculum Map Links:

- Discover our responsibility to care for the earth and one another

Science and Technology:

- Follow established safety procedures during science investigations (SE 2.1)
- Observe and compare the parts of various plants (SE 2.2)
- Use appropriate vocabulary (stem, leaf, root, pistil, stamen, flower, adaptation and germination) in oral and written communication (SE 2.6)
- What are the major parts of a plant? (SE 3.2)

Assessment for Learning

Use observation to identify student's ability to identify parts of a flower.

Students will demonstrate their understanding by working completing BLM 2.2, labelling Parts of a Flower.

Use the "GROWING GREEN" Scientific Journals to evaluate their learning.

Teacher Notes

In this lesson students will be encouraged to handle the plants with care and follow health and safety procedures related to handling plants. They will be invited to examine several flowering plants placed on the prayer table and see if they can identify the names of the various parts of the plant. The words from which to select are posted on the Word Wall.

Materials – BLM 2.2, Grade 3 Science Textbook, plants, and "GROWING GREEN" Scientific Journals, Word Wall word cards

Instruction

Time to Teach

- Ask the student to gather at the prayer table and to look at the flowering plants that are there. Remind them that the plants are living things and so God call us to show love and respect by handling them carefully. Students will be asked to wash hands before and after this sharing session, avoid touching eyes when handling, and never taste any part of the plant unless instructed by the teacher.
- The teacher will pass each plant around and ask the students to look at the plants and look at the word wall and identify any parts that they can name. On a large chart, similar to BLM 2.2, the teacher will model the labeling (stem - holds flower up and delivers water, food, and minerals, leaf - collects sunlight and turns it into sugar for plant to grow , petal – colourful flowers which attract insects, stamen - male part of flower that produces pollen, pistil - female seed producing part of a flower)
- The teacher asks the student to name the part of the plant that grows below the earth? (roots – hold the plant in the ground and bring water and minerals to the plant through the root hairs)
- Invite the students to examine the changes to the bean seeds and chart observations

**Understanding Life Systems Strand
Grade 3**

Time to Practice

- Students will discuss the parts of a flowering plant and their purposes
- Students will examine the words on the Word Wall and try to match the words to the meanings
- Students will complete BLM 2.2 and place in their “GROWING GREEN” Scientific Journals

Time to Share

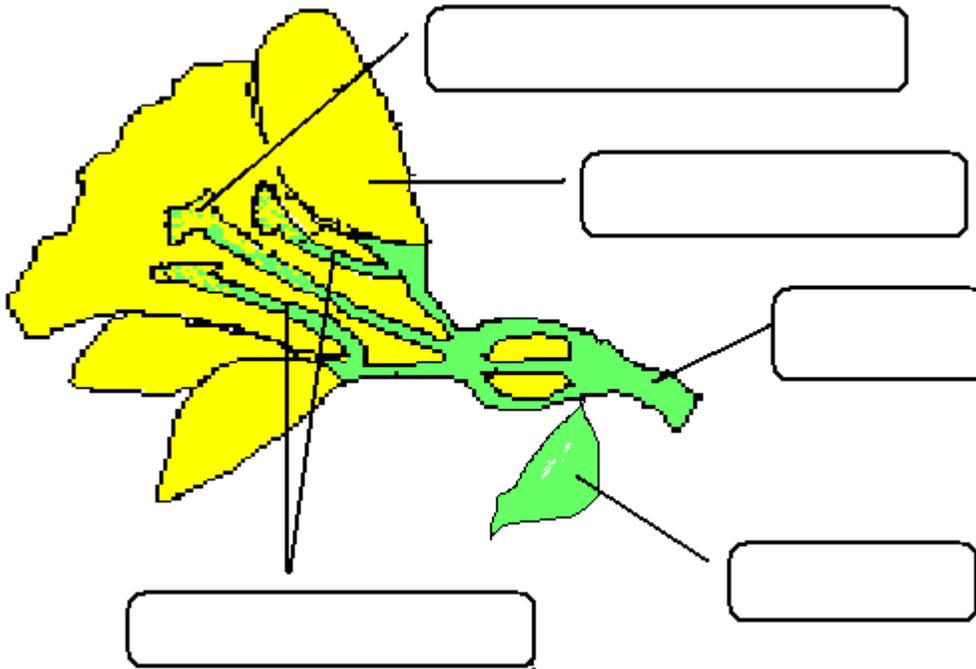
- Students will orally share one new thing they learned today about flowering plants.
- Students will share their observations about the growth of the bean plants.

**Understanding Life Systems Strand
Grade 3**

BLM 2.2

Parts of a Flower

Student Name: _____



The Parts of the Flower

Flower Parts	Purpose
Stem	
Leaf	
Pistil	
Stamen	
Petal	

Understanding Life Systems Strand Grade 3

Lesson 2.3 Needs of Plants

Purpose

Students will examine the various needs of plants and test how the various needs affect plant growth.

Essential Understandings

Catholic Curriculum Map Links:

- Discover our responsibility to care for the earth and one another

Science and Technology:

- Follow established safety procedures during science investigations (SE 2.1)
- Observe and compare the parts of various plants (SE 2.2)
- Use scientific research to answer the following questions: How do plants meet their needs for air, water, light, warmth and space? What are different ways in which we can help plants meet their needs? (SE 2.5)
- Use appropriate vocabulary (stem, leaf, root, pistil, stamen, flower, adaptation and germination) in oral and written communication (SE 2.6)
- Describe the basic needs of plants, including air, water, light, warmth, space (SE 3.1)

Assessment for Learning

Use observation to identify student's ability to identify needs of plants.

Students will demonstrate their understanding by completing BLM 2.3 Plant Observation Chart

Use the "GROWING GREEN" Scientific Journals to evaluate their learning.

Teacher Notes

In this lesson students will be encouraged to handle the plants with care and follow health and safety procedures related to handling plants. They will be invited to examine several bean plants placed on the prayer table. These will have been planted in advance during Lesson 1.1.

Materials – BLM 2.3, bean plants, and "GROWING GREEN" Scientific Journals, Word Wall word cards

Instruction

Time to Teach

- Ask the student to gather at the prayer table and to look at the flowering plants that are there. Remind them that the plants are living things and so God call us to show love and respect by handling them carefully. Students will be asked to wash hands before and after this sharing session, avoid touching eyes when handling and never taste any part of the plant unless instructed by the teacher.
- The teacher will review the observation chart that has been developed since Lesson 1.2 on the changes observed by the students with the bean plants. The students will look at the plants and look at the word wall and identify any parts that they can name. On a large chart, similar to BLM 2.3, the teacher will explain the experiment that they are going to conduct on the bean plants in order to learn about the needs of plants.
- The teacher asks the student to list the things they know that plants need to grow and stay healthy, including: air, water, light, warmth and space.

Understanding Life Systems Strand

Grade 3

- The teacher will explain that in the experiment they are going to look at how each of these needs are important and that if we take any one away, it will affect the plant. It is their job as scientists to predict what will happen and record what they see on BLM 2.3 over a period of several days.

Time to Practice

- Students will identify the parts of the bean plant and describe what a pre-experiment bean looks like - the control plant. They will draw a picture of this plant on BLM 2.3
- Students will offer ways to test each need for the plant. (for example: control – all needs met, light – dark closet, water – take wet paper towel away and put in dry one around beans plants, air – seal in plastic bag, warmth – place outdoors or in fridge, space – cup with 20 seeds add more seeds or paper towels to take away grow space)
- Students will complete BLM 2.3 and place in their “GROWING GREEN” Scientific Journals and add to it each day over a period of observation days

Time to Share

- Students will share their predictions about what will happen to each bean plant.

Understanding Life Systems Strand

Grade 3

BLM 2.3

Experiment: Needs of the Bean Plant

Student Name: _____

The Control Plant Description

This is a picture of the healthy control bean plant that has light, water, air, warmth and space:

My Predictions

When we take away light, the bean plant will:

When we take away water, the bean plant will:

When we take away air, the bean plant will:

When we take away warmth, the bean plant will:

When we take away space, the bean plant will:

**Understanding Life Systems Strand
Grade 3**

Student Name: _____

BLM 2.3 Continued

Experiment Observation Chart			
Bean Plants and Various Needs	Day One	Day Three	Day Five
Control Plant # 1			
Plant # 2 – No Light			
Plant # 3 – No water			
Plant # 4 –No air			
Plant # 5 – No warmth			
Plant # 6 – No space			

Understanding Life Systems Strand Grade 3

Subtask 3: How do Plants Grow?

Good Stewards of God's Grace

As each one has received a gift, use it to serve one another as good stewards of God's varied grace.

1 Peter 4:10

Description

In Subtask 3 students will be given the opportunity to reflect on the needs of plants and how we care for them as steward of God's gifts. Students will plant their own Wildflowers for future observations and research. Students will learn more about how God has created plants in a special way so they can grow and change (germinate) and create (photosynthesis) and give off energy.

Lesson 3.1 Planting Wildflower Seeds

Purpose

Students will review the various needs of plants and examine how we are called to be good stewards in our care of God's gift of plants to us. Students will create a good growing environment and plant their Wildflower seeds for future observations and research.

Essential Understandings

Catholic Curriculum Map Links:

- Understand that the Holy Spirit inspires us to share in the mission of Jesus
- Recognize and share that talents that God has given us and others
- Appreciate the value of care and effort in our work
- Discover our responsibility to care for the earth and one another

Science and Technology:

- How do humans provide and care for an appropriate and healthy environment? (SE 1.2)
- Follow established safety procedures during science investigations (SE 2.1)
- Use scientific research to answer the following questions: How do plants meet their needs for air, water, light, warmth and space? What are different ways in which we can help plants meet their needs? (SE 2.5)
- Use appropriate vocabulary (stem, leaf, root, pistil, stamen, flower, adaptation and germination) in oral and written communication (SE 2.6)
- Describe how most plants get energy to live directly from the sun and how plants help other things get energy (SE 3.4)

Assessment for Learning

Use observation to identify student's ability to identify needs of plants.

Students will demonstrate their understanding by preparing and planting their Wildflower seeds

Use the "GROWING GREEN" Scientific Journals to evaluate their learning.

Understanding Life Systems Strand Grade 3

Teacher Notes

In this lesson students will be plant the Wildflower seeds which will be used for future observation and research. Quick growing wildflower seeds might include: marsh marigolds, zinnias, cosmos, snapdragons, sunflowers, and morning glories. Other planting tips include: For sowing, use commercial potting soil; moisten the seeds an hour or so before sowing but not soggy; sow the seeds about as far below the growing mix as they are large (big ones generally should be covered with growing mix, and tiny ones barely need to be covered. If light is needed for germination, do not cover them at all, just press them into the growing mix); give a light watering and seal the container inside a plastic bag to jump start growth; little seedlings tend to look alike, so be sure to label containers.

Materials – “GROWING GREEN” Scientific Journals, Word Wall word cards, wildflower seeds, potting soil, jars or pots, water, small stones or gravel for base of containers for drainage

Instruction

Time to Teach

- Ask the student to gather at the prayer table and read the short biblical text:
As each one has received a gift, use it to serve one another as good stewards of God's varied grace.
1 Peter 4:10
- Pose the question: What special gift from God have we been studying lately? What does it mean to be good stewards? How can the gifts of the Holy Spirit help us to be good stewards? Remind them that the plants are living things and so God call us to show love and respect by handling them carefully.
- The teacher will ask students to recall the experiments with the bean plants. What have we learned about the needs of plants? The teacher will explain that in order for our Wildflower seeds to grow into flowers in a happy and healthy way we will need to prepare a good growing environment for them. Ask the students what we will need to ensure our seeds grow.
- Ask the students, as good stewards, what steps will we use to plant our seeds? (clean the jar or pot, place small stones or gravel in the bottom of the jar or pot, place potting soil $\frac{3}{4}$ of the way up the pot, place seeds in on top, cover the remaining $\frac{1}{4}$ with soil, water, and place on a warm well lighted window ledge)

Time to Practice

- Students will begin to plant the Wildflower seeds as discussed in the shared Time to Teach section. They may work with a partner to help each other in the process (but ensure that each student has their own plant by the end of the lesson)
- Students will complete BLM 3.1 My Research Report
- Students will write a prayer in their GROWING GREEN scientific journals to answer this prompt: Dear God: As a good steward of creation, I know I can help my Wildflower seeds grow by...

Time to Share

- Students will share their prayers.

**Understanding Life Systems Strand
Grade 3**

BLM 3.1a)

My Wildflower Research Report

Student Name: _____

My Wildflower is called: _____

On the package of seeds I learned that my wildflower likes the following things to grow:

--	--	--

In order to be a good steward of Creation, I took careful steps in planting my wildflower seeds:

Step One:	Step Two:
Step Three:	Step Four:

**Understanding Life Systems Strand
Grade 3**

BLM 3.1b)

My Wildflower Research Report

Student Name: _____

My Wildflower is called: _____

Record important dates and growth measurements of your Wildflower in column one. In column two, using words or pictures, share your observations of the Wildflower's growth.

My Observation Record of Growth	
Date my seeds were planted:	Observation:
Date sprouts broke through the soil:	Observation:
Measurement at one week:	Observation:
Measurement at two weeks:	Observation:
Measurement at three weeks:	Observation:
Date to take my Wildflower home:	Observation:

Understanding Life Systems Strand Grade 3

Lesson 3.2 What is Germination?

Purpose

Students will review what they did to prepare a good growing environment to plant their Wildflower seeds. They will now learn about what is happening below the soil as the plant starts to grow. They will learn about the term germination which was introduced in Lesson 2.2.

Essential Understandings

Catholic Curriculum Map Links:

- Appreciate the value of care and effort in our work
- Discover our responsibility to care for the earth and one another

Science and Technology:

- Use scientific research to answer the following questions: How do plants meet their needs for air, water, light, warmth and space? What are different ways in which we can help plants meet their needs? (SE 2.5)
- Use appropriate vocabulary (stem, leaf, root, pistil, stamen, flower, adaptation and germination) in oral and written communication (SE 2.6)

Assessment for Learning

Use observation of student responses.

Assess student responses in the “GROWING GREEN” Scientific Journal about germination

Teacher Notes

Students will recall past information about preparing a good growing environment for their Wildflowers, recording any changes to the plants in the research template provide in BLM 3.1b). This lesson will focus on an activity to build in a deeper understanding of the term germination and the other words on the Word Wall.

Materials – “GROWING GREEN” Scientific Journals, Word Wall word cards, BLM 3.1b)

Instruction

Time to Teach

- Ask the student to gather at the prayer table and reflect on last day’s planting activities. Students will be asked to report any changes in their wildflower plants. Record growth changes on BLM 3.1 b)
- Review words on the Word Wall with a guessing game of clues. (e.g. Clue One: I am thinking of a part of the plant that is a support for the plant? Clue Two: It is sometime green. Clue Three: It carries water and nutrients up to the flower? Answer: Stem)
- Frame the learning: Today we are going to learn a new term which we spoke about in an earlier lesson. The word is germination. Look at our Word Wall. Can you locate the new word? What do you think it means? Let’s explore the dictionary definition. Model word location. Write the meaning next to the word on the Word Wall (Root word – germinate: to begin to grow or sprout).
- Students will be invited to recall the many ideas and activities discussed in Subtask 2 about the needs of plants. Which of these needs would be necessary for a seed to germinate and grow into a plant? (rich soil, warmth, water, space, etc)

Understanding Life Systems Strand

Grade 3

- Reflect on the bean plant activity. What did you see happening to the bean seed as it grew? (once seed was soaked in water, it grew a young root, the skin of the bean split and the shoot straightened, as the root got bigger other side root hairs appeared, first leaf appeared)

Time to Practice

- Students will record any changes observed in their Wildflower plant on BLM 3.1b)
- Review the Word Wall words responding to and posing clues in the guessing game.
- Students will respond to the questions posed about the word germination, plant needs and bean activity
- Students will draw and label a picture of the germination process in the “GROWING GREEN” Scientific Journal

Time to Share

- Students will share their labeled diagrams of germination

Understanding Life Systems Strand Grade 3

Lesson 3.3 What is Photosynthesis?

Purpose

Students will review what they did to prepare a good growing environment to plant their Wildflower seeds. They will now learn about how plants help themselves to grow through the process of photosynthesis – a miracle of God’s creation.

Essential Understandings

Catholic Curriculum Map Links:

- Understand that the Holy Spirit inspires us to share in the mission of Jesus
- Appreciate the value of care and effort in our work
- Discover our responsibility to care for the earth and one another

Science and Technology:

- Use scientific research to answer the following questions: How do plants meet their needs for air, water, light, warmth and space? What are different ways in which we can help plants meet their needs? (SE 2.5)
- Use appropriate vocabulary (stem, leaf, root, pistil, stamen, flower, adaptation and germination) in oral and written communication (SE 2.6)
- Describe how most plants get energy to live directly from the sun and how plants help other things get energy (SE 3.4)

Assessment for Learning

Use observation to identify student’s ability to identify needs of plants.

Students will show they understand the connection between a need (light), a part of the plant (leaf) and photosynthesis (energy) in helping the plant grow in a healthy way. Use the “GROWING GREEN” Scientific Journals to evaluate their learning.

Completion of BLM 3.1b) as it progresses.

Teacher Notes

Students will recall past information and synthesis the various components that are needed to grasp an understanding of one of God’s miracles in the plant world, photosynthesis.

Materials – “GROWING GREEN” Scientific Journals, Word Wall word cards, BLM 3.2

Instruction

Time to Teach

- Ask the student to gather at the prayer table and reflect on last day’s planting activities. Students will be asked to report any changes in their Wildflower plants. Record growth changes on BLM 3.1 b)
- Frame the learning: Today we are going to learn a special thing about plants. It is called Photosynthesis. Add the word to the Word Wall. Discuss its meaning (S&T Glossary p. 161: The process by which green plants use the energy from the sunlight to convert carbon dioxide and water into nutrients, producing oxygen as a byproduct. Photosynthesis is very important, because it produces the oxygen and carbohydrates that animals (including people) need to live)
- Using BLM 3.2 conduct a shared reading lesson and discuss the meaning of photosynthesis in simple terms.

Understanding Life Systems Strand
Grade 3

Time to Practice

- Students will record any changes observed in their Wildflower plant on BLM 3.1b)
- Students will participate in the shared reading of BLM 3.2
- Students will draw and label a picture of the main elements needed for photosynthesis to occur in their “GROWING GREEN” Scientific Journals: include a sun, a leaf, water and carbon dioxide going in, and food and oxygen going out
- Students will also write a sentence about why photosynthesis is important.

Time to Share

- Students will share their labeled diagrams of photosynthesis and share why they think that photosynthesis is an important process for the plant and for the world.

Understanding Life Systems Strand Grade 3

BLM 3.2

Photosynthesis

Student Name: _____

Photosynthesis is an important process for plants and for all of life.

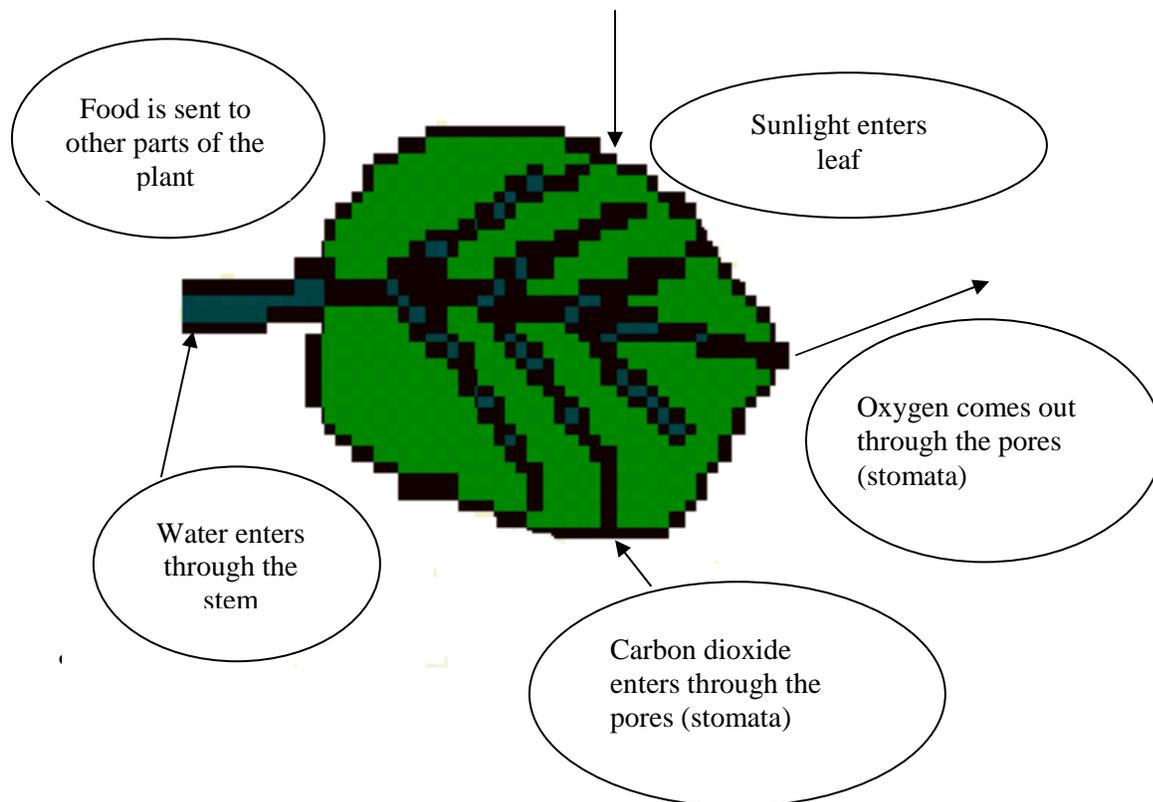
For photosynthesis to happen naturally, there must be sunlight, the green leaves of a plant, water and air.

Most animals, including people, breathe in oxygen and breathe out carbon dioxide.

Green plants take in carbon dioxide from the air and give off oxygen. There are small pores in the leaves called stomata. This is how the carbon dioxide goes in and the oxygen comes out.

Photosynthesis is important because we need fresh oxygen to live in our world.

In photosynthesis, the green plant uses energy from the sunlight to change the carbon dioxide and water from the soil and air to make sugar and oxygen. The sugar is combined with the water to make nutrients or food for the plant to grow. The oxygen is give off into the atmosphere.



Understanding Life Systems Strand Grade 3

Subtask 4: Why are Plants Important?

To each is given the manifestation of the Spirit for the common good. For just as the body is one and has many members, and all the members of the body, though many, are one body, so it is with Christ. **1 Corinthians 12: 4-7, 12**

Description

Students will examine a wide variety of plants and what they offer to us for our common good, looking at the ways in which humans use the good things plants provide for us. Students will examine the interdependence of plants and animals in our world and reflect upon how our actions impact that relationship.

Lesson 4.1 Uses of Plants

Purpose

Students will work in groups to find examples of the many gifts humans receive from plants and develop shared charts to illustrate their learning..

Essential Understandings

Catholic Curriculum Map Links:

- Appreciate the value of care and effort in our work
- Recognize and share the talents that God has given us and others
- Discover our responsibility to care for the earth and one another

Science and Technology:

- How are plants important to humans and other living things? (SE 1.1)
- Describe ways in which humans use plants for food, shelter, medicine and clothing (SE 3.5)

Assessment for Learning

Use observation to identify student's ability to contribute to group work.

Provide feedback to students to ensure their understandings are accurate.

Use the Student "GROWING GREEN" Scientific Journals to evaluate their learning

Record keeping on BLM 3.1b)

Teacher Notes

This lesson also connects to the GRADE 3 RELIGION AND FAMILY LIFE PROGRAM: UNIT 7

ITSWB – "Discover our responsibility to care for the earth and one another"; FA 1.1, 1.5, 5.1 –

"Recognize and share the talents and gifts that God has given us"; FA 5.3 – "Appreciate the value of care and effort in their work".

This lesson will provide the students with the opportunity to witness that there are a vast variety of plants and that as humans we benefit from what they can provide us. In advance, prepare large charts for group work. Entitle the charts: Food, Animal Habitats, Construction, Beauty, Medicine, Clothing, Environmental.

Materials - a Bible, an age-appropriate "Spiritual/Environmental" book (e.g. The Giving Tree by Shel Silverstein), chart paper, markers, and magazines, "GROWING GREEN" Scientific Journals.

Understanding Life Systems Strand Grade 3

Instruction

Time to Teach

- Teacher points to the chart with the Unit Guiding Question (Why are all plants in God’s creation important and what are our responsibilities toward them?) and reads the Scripture passage: To each is given the manifestation of the Spirit for the common good. For just as the body is one and has many members, and all the members of the body, though many, are one body, so it is with Christ. **1 Corinthians 12: 4-7, 12**
- Teacher asks students to reflect on the scripture passage from Corinthians and how plants are important because they contribute to the common good of people in the world. Discuss.
- To further this discussion read the book, The Giving Tree and have students think about all the things the tree gave to others and list cooperatively on a chart.
- Teacher will explain the group activity. Working in small groups, each will take one of the charts and find examples (either in word, photograph or drawing) of how different plants, directly (cotton to t-shirts) or indirectly (goats eat shrubs and grass and we eat goat cheese), from around the world. Discuss the following titles: Food, Animal Habitats, Construction, Beauty, Medicine, Clothing, and Environmental. Each group is asked to find 5-10 unique or different examples for each category.
- Students will be asked to report any changes in their Wildflower plants. Record growth changes on BLM 3.1 b)

Time to Practice

- Students respond as a whole group to the UNIT GUIDING QUESTION, the Scripture Passage and The Giving Tree.
- Students will work cooperatively in small groups to complete the chart paper activity of Uses of Plants.
- Students will record any changes in their Wildflower plants on BLM 3.1 b)

Time to Share

- Each group will present their group work around Uses of Plants
- Students will enter a response into their “GROWING GREEN” Scientific Journals for the prompt: Plants have many uses in our world. For me, I respect the importance of plants because three things plants give me are.... Say a prayer of thanksgiving.

Understanding Life Systems Strand Grade 3

Lesson 4.2 Interdependence of Plants and Animals

Purpose

Students will learn about ways in which plants help other living things to survive. For this reason we must consider how we as humans need to protect plants and their habitats.

Essential Understandings

Catholic Curriculum Map Links:

- Understand that the Holy Spirit inspires us to share in the mission of Jesus
- Appreciate the value of care and effort in our work
- Discover our responsibility to care for the earth and one another

Science and Technology:

- How are plants important to humans and other living things? (SE 1.1)
- How do various plants and animals depend on each other? (SE 3.6)
- How do environmental conditions sometimes threaten plant and animal survival? (SE 3.8)

Assessment for Learning

Use observation to identify student's ability to respond to the questions and activities.

Provide feedback to students to ensure their understandings are accurate.

Use the Student "GROWING GREEN" Scientific Journals to evaluate their learning

Teacher Notes

The teacher will present various scenarios and ask the students how the animal is dependent on the plant. Students will then be asked to work in small groups and develop an example. They will pick a specific example of an animal and how it is dependent on plants to survive. The teacher will also introduce environmental issues which may impact the plant and ask students to predict how this may influence the plants and animals. What is our responsibility as stewards of creation?

Materials - a Bible, an age-appropriate "Spiritual/Environmental" book (e.g. The Giving Tree by Shel Silverstein), chart paper and markers, "GROWING GREEN" Scientific Journals, Word Wall words

Instruction

Time to Teach

- Teacher reminds students of the book, The Giving Tree and asks students if in the book there was any reference to animals and the tree? Revisit sections of the story if needed.
- Students are asked to think of ways in which plants help animals and animals are dependent on plants. Refer to the chart activity in Lesson 4.1 Uses of Plants (Animal Habitat, Food, Environment, etc) and Lesson 3.3 Photosynthesis (Oxygen)
- Teacher will explain the term Interdependent and place it on the Word Wall. (Root word: Depend - to rely or count on each other)
- Ask the students to think of an example of when an animal might be dependent on a plant? (e.g. cow - food, birds - nest, bees - nectar, etc). In small groups get the student to think of their own example(s) to share with the whole class.
- Discuss how animals and plants might be impacted with environmental conditions such as floods, extreme heat, extreme cold, fires, construction, etc.
- Refer to the Guiding Question: Why are all plants in God's creation important and what are our responsibilities toward them? If this is what we believe, how can we minimize harmful effects and enhance good effects?

Understanding Life Systems Strand

Grade 3

Time to Practice

- Students respond as a whole group to the questions about The Giving Tree and what it gave to benefit animals (including humans), and the many uses of plants which show we are very dependent on them
- Students will work cooperatively in small groups to extend the discussion of how an animal might be dependent on plants and provide new examples
- Students will record in their “GROWING GREEN” a response to the prompt:
 - I know animals are dependent on plants. One example of an animal depending on plant life is:
 - I believe that all God’s creation is important. I can help take care of plants in our world by:
 - To make our environment better for plants to grow, because we are all dependent on plants, I could:
- Students will be asked to record growth changes on BLM 3.1 b)

Time to Share

- Each group will orally present their example of an animal that is dependent on plants
- Students will share their responses in their “GROWING GREEN” journals

Understanding Life Systems Strand Grade 3

Subtask 5: Culminating Performance Task

Description

In the Culminating Task for “**Growth and Changes in Plants**” unit, the students will be asked to complete a research report on the Wildflower of their choice which was planted as a class activity in Lesson 3.1. Students have tracked the growth and changes in the Wildflower on BLM 3.1b) for several days. They will now complete the research on this plant.

Lesson 5.1 Culminating Task

Purpose

Students will conclude the study of plants through the completion of My Wildflower Research Report. The students will plan a celebration prayer service to close the unit.

Essential Understandings

Catholic Curriculum Map Links:

- Understand that the Holy Spirit inspires us to share in the mission of Jesus
- Recognize and share the talents that God has given us and others
- Appreciate the value of care and effort in our work
- Discover our responsibility to care for the earth and one another

Science and Technology:

- How are plants important to humans and other living things? (SE 1.1)
- How do humans provide and care for an appropriate and healthy environment? (SE 1.2)
- Use appropriate science and technology terminology (SE 2.6)
- What are the major parts of a plant? (SE 3.2)
- Describe the changes different plants undergo in the life cycle (SE 3.3)

Language:

Reading

- Identify a variety of text features and explain how they help readers understand texts

Writing

- Sort ideas and information for their writing in a variety of ways
- Gather information to support ideas for writing in a variety of ways and/or a variety of sources
- Write short text using a variety of forms (eg. Informational report, journal entry, labelled diagram, experiment)

Assessment of Learning

Provide feedback to students to ensure their understandings are accurate.

Rubric to assess completion on My Wildflower Research Report

Teacher Notes

This lesson will provide the students with a summative review of the **Grade 3 “Growth and Changes in Plants” Unit**, including the recall of lessons taught and transferring this learning while completing the My Wildflower Research Report.

Materials- BLM 3.1a), 3.1 b), 5.1 and rubric

Understanding Life Systems Strand

Grade 3

Instruction

Time to Teach

- Teacher asks the students to look at the work they recorded on BLM 3.1a) and 3.2b). Invite the students to reflect upon the changes they have recorded.
- Explain that the classroom Wildflower Garden has grown because of the care and attention that the students have given their plants. As the unit finishes, it is important to complete our Research Report, as outlined in BLM 5.1 which will be added to BLM 3.1a) and 3.1b). When the project is complete students will be asked to create a colourful title page for their report.
- Together when it is time to share, you will offer a prayer of thanksgiving for one thing you have learned during the unit of study. Think of something to share with the group while you complete your Research Report.

Time to Practice

- Students will respond to questions and bring BLM 3.1a) and 3.1b) to share.
- Students will work to complete BLM 5.1
- Students will put the work together to form the Research Booklet and draw a title page.
- Students will think of one prayer of praise and thanksgiving for something they have learned.

Time to Share

- Sharing their Research Reports and the one thing they are thankful for in learning about plants.

Understanding Life Systems Strand

Grade 3

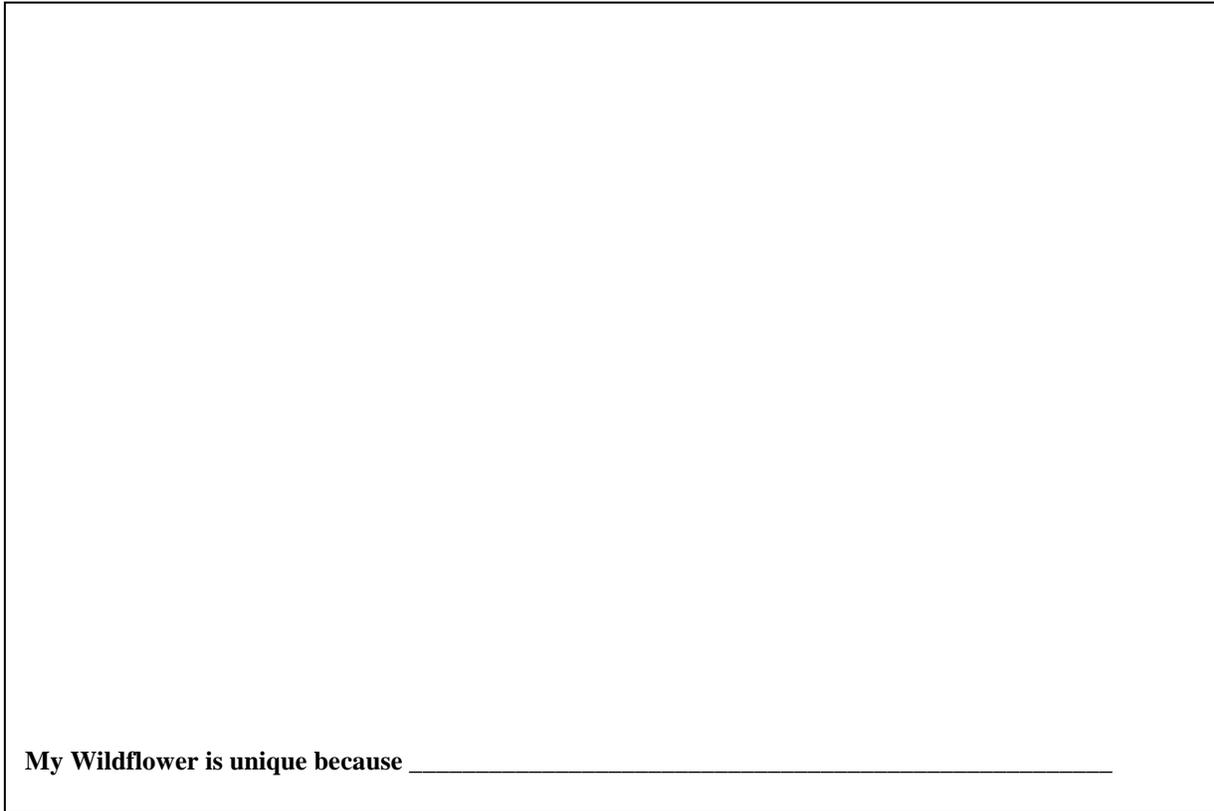
BLM 5.1

My Wildflower Research Report

Student Name: _____

My Wildflower is called: _____

Draw a picture of your Wildflower now that it has grown. Label the parts of your plant.



My Wildflower is unique because _____

Read and research your plant. Write three things you learned about your Wildflower:

1. _____

2. _____

3. _____

Understanding Life Systems Strand

Grade 3

Student Name: _____

What are the basic needs of your Wildflower? Draw or name three examples of what plants need:

--	--	--

How did your Wildflower change over the time that you were watching it grow?

Why are Wildflowers important and how can we protect them?

When you take your Wildflower home, what will you do with it to show that you know that it is an important part of God's creation and you are responsible to care for it?

**Understanding Life Systems Strand
Grade 3**

Student Name: _____				
Categories	Level 1	Level 2	Level 3	Level 4
Knowledge and Understanding – Subject-specific content acquired in each grade (knowledge), and the comprehension of its meaning and significance (understanding)				
Knowledge of characteristics and needs of plants as they grow and change	The student: <ul style="list-style-type: none"> demonstrates limited knowledge of characteristics and needs of plants as they grow and change 	The student: <ul style="list-style-type: none"> demonstrates some knowledge of characteristics and needs of plants as they grow and change 	The student: <ul style="list-style-type: none"> demonstrates considerable knowledge of characteristics and needs of plants as they grow and change 	The student: <ul style="list-style-type: none"> demonstrates thorough knowledge of characteristics and needs of plants as they grow and change
Understanding of our human impact and our interdependence on plants	The student: <ul style="list-style-type: none"> demonstrates limited understanding of our human impact and our interdependence on plants 	The student: <ul style="list-style-type: none"> demonstrates some understanding of our human impact and our interdependence on plants 	The student: <ul style="list-style-type: none"> demonstrates considerable understanding of our human impact and our interdependence on plants 	The student: <ul style="list-style-type: none"> demonstrates thorough understanding of our human impact and our interdependence on plants
Thinking and Investigation - – The use of critical thinking skills and inquiry and problem-solving skills and/or processes				
Use of information gathered to determine why all plants in God’s creation are important and what our responsibilities are toward them	The student: <ul style="list-style-type: none"> determines why all plants in God’s creation are important and what our responsibilities are toward them with limited effectiveness 	The student: <ul style="list-style-type: none"> determines why all plants in God’s creation are important and what our responsibilities are toward them with some effectiveness 	The student: <ul style="list-style-type: none"> determines why all plants in God’s creation are important and what our responsibilities are toward them with considerable effectiveness 	The student: <ul style="list-style-type: none"> determines why all plants in God’s creation are important and what our responsibilities are toward them with a high degree of effectiveness
Use of processing skills and strategies to identify changes in plants in experiments (needs, growth)	The student: <ul style="list-style-type: none"> uses processing skills and strategies to identify changes in plants in experiments (needs, growth)with limited effectiveness 	The student: <ul style="list-style-type: none"> uses processing skills and strategies to identify changes in plants in experiments (needs, growth)with some effectiveness 	The student: <ul style="list-style-type: none"> uses processing skills and strategies to identify changes in plants in experiments (needs, growth)with considerable effectiveness 	The student: <ul style="list-style-type: none"> uses processing skills and strategies to identify changes in plants in experiments (needs, growth)with a high degree of effectiveness

**Understanding Life Systems Strand
Grade 3**

Communication - The conveying of meaning through various forms				
Expression and organization of ideas and information in Scientific Journal form	The student: <ul style="list-style-type: none"> expresses and organizes the ideas and information in Scientific Journal form with limited effectiveness 	The student: <ul style="list-style-type: none"> expresses and organizes the ideas and information in Scientific Journal form with some effectiveness 	The student: <ul style="list-style-type: none"> expresses and organizes the ideas and information in Scientific Journal form with considerable effectiveness 	The student: <ul style="list-style-type: none"> expresses and organizes the ideas and information in Scientific Journal form with a high degree of effectiveness
Communication in the form of a research report	The student: <ul style="list-style-type: none"> communicates his/her knowledge of the issue in a research report with limited effectiveness 	The student: <ul style="list-style-type: none"> communicates his/her knowledge of the issue in a research report with some effectiveness 	The student: <ul style="list-style-type: none"> communicates his/her knowledge of the issue in a research report with considerable effectiveness 	The student: <ul style="list-style-type: none"> communicates his/her knowledge of the issue in a research report with a high degree of effectiveness
Use of conventions, vocabulary and terminology of the unit in written form	The student: <ul style="list-style-type: none"> uses conventions, vocabulary and terminology of the unit with limited effectiveness 	The student: <ul style="list-style-type: none"> uses conventions, vocabulary and terminology of the unit with some effectiveness 	The student: <ul style="list-style-type: none"> uses conventions, vocabulary and terminology of the unit with considerable effectiveness 	The student: <ul style="list-style-type: none"> uses conventions, vocabulary and terminology of the unit with a high degree of effectiveness
Application - The use of knowledge and skills to make connections within and between various contexts				
Application of knowledge when preparing research report	The student: <ul style="list-style-type: none"> applies knowledge when preparing research report with limited effectiveness 	The student: <ul style="list-style-type: none"> applies knowledge when preparing research report with some effectiveness 	The student: <ul style="list-style-type: none"> applies knowledge when preparing research report with considerable effectiveness 	The student: <ul style="list-style-type: none"> applies knowledge when preparing research report with a high degree of effectiveness
Transfer of the knowledge of the Growth and Changes in Plants and how God wants us to care for them and why	The student: <ul style="list-style-type: none"> applies knowledge of the Growth and Changes in Plants and how God wants us to care for them and why with limited effectiveness 	The student: <ul style="list-style-type: none"> applies knowledge of the Growth and Changes in Plants and how God wants us to care for them and why with some effectiveness 	The student: <ul style="list-style-type: none"> applies knowledge of the Growth and Changes in Plants and how God wants us to care for them and why with considerable effectiveness 	The student: <ul style="list-style-type: none"> applies knowledge of the Growth and Changes in Plants and how God wants us to care for them and why with a high degree of effectiveness