**Standard:**
The student will **demonstrate** an **understanding** of how the **structures** of **plants** help them **survive** and **grow** in their **environments**.

**Conceptual Understanding:**
Plants have specific structures that help them survive, grow, and produce more plants. Plants have predictable characteristics at different stages of development. Plants have basic needs that provide energy in order to grow and be healthy. Each plant has a specific environment where it can thrive. There are distinct environments in the world that support different types of plants. These environments can change slowly or quickly. Plants respond to these changes in different ways.

**NOTE:** The SC Computer Science and Digital Literacy Standards are in effect as of this **school year**. Embedding these standards into your lesson plans is not an option as we move our students towards 21st century learning in preparation of college and career readiness. The following information will be helpful in planning for the incorporation of these very important standards that students need to learn.

**Computer Science & Digital Literacy Standards:**

**Digital Literacy--Standard 1:**
*Use software applications to create an authentic product.*
1.DL.1.1 Produce a simple sentence using word processing software
1.DL.1.2 Create a simple presentation with text and/or image

*I can produce and create with...*
Microsoft Office 365 products—Sway, Word, One Notebook, Excel, PowerPoint, Keynote
Nearpod (Interactive presentation/teaching and learning tool)
Publisher (Desktop publisher)
Powerpoint (Desktop PowerPoint)
SeeSaw (Electronic Portfolio and work space—Apple)
Computing Systems—Standard 1:  
*Understand that computing devices are used to perform a variety of tasks and take many forms*

1.CS.1.2 Recognize some computing devices (e.g., computer, smartphone) can perform a variety of tasks and some computing devices are specialized (e.g., navigation system, game controller)

*I can recognize...*  
- Different computing devices  
- Which device can perform what  
- Which device specializes in specific tasks

Network and the Internet—Standard 1:  
*Discover that computing devices and the internet enable us to connect with other people, places, information, and ideas.*

1.NI.1.1 Recognize that the internet can be used to gather information

*I can research...*  
- Plant parts  
- Plant cycle  
- Plants and their environments  
- Seeds  
- Soil

Data and Analysis—Standard 1:  
*Discover how data can be stored in and retrieved from multiple locations.*

1.DA.1.1 Recognize that a variety of data (e.g., music, video, images, text) can be stored and retrieved from a computing device

*I can recognize...*  
- How to use computing device to find images  
- How to use computing device to add music to videos, slides, etc.  
- How to type on a computing device
What do the students need to know?
Structures of plants
Different environments
Stages of development
Observations
Measuring tools
Different seeds and purposes
Plants habitats
Plants need to live
Characteristics of plants
Distinct environment
Data of changes with plants

What do the students need to be able to do? “I Can” Statements:

Demonstrate an understanding of how the structures of plants help them survive and grow in their environments

Prove
Validate
Show
Reveal

- I can demonstrate my understanding of how the structures of plants help them survive and grow in their environments by:
**Conduct:**
Plan
Strategize

**I can conduct...**
- Investigations about what plants need to live
- Investigations about what plants need to grow
- Questions about investigations
- Conversations with others

**Develop:**
Grow
Mature
Progress
Advance
Change
Improve

**I can develop...**
- Models of different plants
- Models of different environments
- Models of different characteristics of plants
- Models of distinct environments
- Ideas and investigations

**Use:**
Practice
Procedure
Habit
Routine

**I can use...**
- A model
- A computer
- Gardening tools
- Measuring tools
- Digital devices to collect information
Communicate:
Connect
Link
Join
Transfer
Talk

I can communicate...

- Talk about, explain, describe, create, draw, interview, ask and answer questions, compare, connect with other people in different states or countries, skype, video record, or demonstrate an understanding of how the structures of plants help them survive and grow in their environments

Questions and Answers

- **What is a plant?**
  Students are introduced to the study of plants. They begin by sprouting bean seeds on moistened paper towels and making drawings and measurements of their growth.
  Students apply their understanding by performing their own investigations of plant growth. They gather seeds by walking outdoors wearing an old sock over one of their shoes. They plant their seeds and observe the resulting plants.

- **What are the parts of a plant?**
  Students identify and sort plant parts through hands-on activities and group discussions and then work with magnifying lenses to document their observations.
  Using I-Pads, the students will take a walk around the school grounds looking for roots, stems, leaves, flowers, and seeds and take a picture of each part.
  They will then use Google Slides to write about each part.

- **What are the parts of a seed and how does each part help a new plant begin?**
  The students will explore the inside of a bean and learn the parts of the interior. After exploring a real bean, the students will create their own model of a bean and label each part. It is important for students to understand the inside of the seed because it is where reproduction of the new plant begins. Students need to understand that the new plant starts inside the seed and sprouts out from there.

- **What different environments can plants survive in?**
  You will need four healthy plant starts or you can plant your own and have them ready for this lesson. I always teach this unit in the spring and the starts are readily available. Through a group discussion the students will create a chart of the things that they think plants need to survive. They will then set up the plants in 4 different environments and conduct a two week observational experiment.
• **What is the life cycle of a lima bean from seed to plant? An apple? A pumpkin?**

The students will start the lesson by looking at the inside of a variety of fruits and discovering that each one has a seed. The students will then use a laptop to watch a video about the life cycle of a bean. They will work in teams to create life cycle posters for their bean and finish the lesson with a reading of *Seed to Plant* by Gail Gibbons.


You will need several examples of root systems (dandelion, radish, carrot, sweet potato, and magnifying glasses. The students will explore a variety of roots and learn about the types of roots and the function of them through a class exploration and discussion.

The students will start the lesson by going outside to find different examples of stems. The class will then gather and discuss their findings and talk about the similarities and differences of the stems they collected. The class will then set up an experiment with a variety of stems to discover how a stem delivers water and nutrients to the rest of the plant.

The students start by watching a video about simple and compound leaves. They then go on a hunt to find examples of each. The class will then sort them into the two categories. The lesson will end with an in-depth talk about the components of a leaf.

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### Differentiation and RtI Ideas

**Digital Literacy--Standard 1:**
*Use software applications to create an authentic product.*

**Computing Systems--Standard 1:**
*Understand that computing devices are used to perform a variety of tasks and take many forms*

**Data and Analysis--Standard 3:**
*Explore how data can be displayed for communication in many ways*

- **Conduct observations and Investigations on:** plants, roots, stems, leaves, flowers, fruits, seeds
  - **Tier 1:** Observe and draw the parts of a plant
  - **Tier 2:** Observe, draw and label the parts of a plant and discuss with a partner
  - **Tier 3:** Create a model of how all the parts of a plant work together
  - **Tier 4:** Use technology to show the different parts of plants and how they work together
  - [https://betterlesson.com/user/324562/68206/170811/thomas-young/curriculum](https://betterlesson.com/user/324562/68206/170811/thomas-young/curriculum) has great lessons for plant parts when making observations and investigations

- **Seed Sorting**
  - **Tier 1:** Sort seeds by size and color
  - **Tier 2:** Write about the differences between the seeds
  - **Tier 3:** Explain why some are one seed and other groups of seeds
• **Plant Life Cycle Investigations**
  - **Tier 1:** Draw a plant’s life cycle in science journal
  - **Tier 2:** Draw and label a plant’s life cycle in science journal and discuss it with a partner
  - **Tier 3:** Create a model of a plant’s life cycle and present it
  - **Tier 4:** Use technology to demonstrate a plant’s life cycle with a video


• **Plant Needs Investigations**
  - **Tier 1:** Draw a picture of what plants need
  - **Tier 2:** Draw a picture and write a sentence about what plants need
  - **Tier 3:** Create a model showing what plants need
  - **Tier 4:** Use technology to demonstrate what plants need

  - [https://www.stem.org.uk/elibrary/resource/34256](https://www.stem.org.uk/elibrary/resource/34256) (templates and lessons)
**Teacher Modeling Ideas**

- **How to communicate information**
  Model for the students the language you want them to use while having conversation with others. Create an anchor chart of the language to use when discussing plants and when addressing each other.

- **How to gather information**
  Show the students different ways that they can obtain information from (books, internet, articles, etc). Demonstrate how to use these things responsibly and have them obtain information about another topic to assess understanding. Create a rubric in [www.rubistar.com](http://www.rubistar.com) to assess.

- **How to analyze and interpret data**
  Show the students a completed data piece and demonstrate how to analyze and interpret including how to form questions. Create a question anchor chart with questioning words. Issue a piece of data and have students form 3 questions of their own to assess their understanding.

- **How to create models to show different characteristics of plants in distinct environments**
  Use design process to design and to construct a model.

**Documenting Student Progress**

- **Anecdotal Notes Templates**
  1- [https://www.pinterest.com/pin/205758276702480971/?lp=true](https://www.pinterest.com/pin/205758276702480971/?lp=true)
  2- [http://www.eworkshop.on.ca/edu/pdf/mod15_anecd_obs_record.pdf](http://www.eworkshop.on.ca/edu/pdf/mod15_anecd_obs_record.pdf)

- **Observation Forms**
  2- [https://www.teacherspayteachers.com/Product/Sequence-of-Events-Graphic-Organizer-Butterfly-Life-Cycle-1400009](https://www.teacherspayteachers.com/Product/Sequence-of-Events-Graphic-Organizer-Butterfly-Life-Cycle-1400009)

- **Note-booking/recording**
  1- [https://drive.google.com/file/d/0B-cVjZMBBNXWFDQXhNVV2RWY0U/view](https://drive.google.com/file/d/0B-cVjZMBBNXWFDQXhNVV2RWY0U/view)

- **Rubric Templates/Tools**
  3- [https://www.rcampus.com/rubricshowc.cfm?code=DX34C7X&sp=yes&](https://www.rcampus.com/rubricshowc.cfm?code=DX34C7X&sp=yes&)

- **Progress Monitoring Forms**
  1- [https://betterlesson.com/lesson/resource/3204039/soil-pre-test](https://betterlesson.com/lesson/resource/3204039/soil-pre-test)
  2- [https://betterlesson.com/lesson/resource/3228789/question-vine](https://betterlesson.com/lesson/resource/3228789/question-vine)
(Technology Assessment Tools/Games/Etc.)

- **Electronic Tools and Games**
  
  - [http://www.sciencekids.co.nz/plants.html](http://www.sciencekids.co.nz/plants.html)
  - [https://www.neok12.com/plants.htm](https://www.neok12.com/plants.htm)

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**Additional Examples of Progress Monitoring/Assessment Tools**

1. Using a teacher-created chart of plant data including plant growth, structures of plants, plant needs, etc. Students will predict the growth and care of plants in different environments over time.
2. Quizlet makes simple learning tools that let you study anything. Learning with flashcards, games, and learning tools while working in groups.
3. Create and gather innovative assessments relating to specific standards being taught. [www.masteryconnect.com](http://www.masteryconnect.com) (on desktop as well)
4. Nearpod is an interactive classroom tool for teachers to engage students with interactive lessons and assessments. [www.nearpod.com](http://www.nearpod.com)

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(2) **Quizlet**

![Quizlet](https://www.quizlet.com)

(3) **Mastery Connect**

Mastery Connect Plant Assessment

(4) **Nearpod**

![Nearpod](https://www.nearpod.com)