Science 3-5: Spines or Stems

Intended Audience: Students with significant cognitive disabilities

# **Standards:**

SC.3.L.15.1 Classify animals into major groups (mammals, birds, reptiles, amphibians, fish, arthropods, vertebrates and invertebrates, those having live births and those which lay eggs) according to their physical characteristics and behaviors.

Sc.4.L.16.2 Explain that although characteristics of plants and animals are inherited, some characteristics can be affected by the environment.

SC.5.L.14.2 Compare and contrast the function of organs and other physical structures of plants and animals, including humans, for example: some animals have skeletons for support- some with internal skeletons others with exoskeletons- while some plants have stems for support.

# **Learning Objectives:**

1. Students will compare and contrast the major life cycles of Florida plants and animals.
2. Students will classify the support structure of plants and animals into categories: those that have stems and those that have skeletons/spines.

# **Vocabulary:**

1. stem: the main trunk of a plant
2. skeleton: the bones that support the tissues and organs of an animal (vertebrate)
3. spine: the bones of an animal (vertebrate) that extend from the neck to the tail.

**Materials:**

* Video: [The Spine Song (with facts)](https://www.youtube.com/watch?v=V4MLWJDL_a8)
* Video: [Parts of a Plant: The Stem](https://www.youtube.com/watch?v=2klJcpdeEEc) from 0:00- 1:14 (after 1:15 there are experiments for deeper engagement and application)
* Graphic organizer for compare and contrast
* Prepare prior to instruction: visual supports for academic content to include at least 5 images of plants and 5 images of animals (vertebrates) to include a human image

# **Essential/Guiding Questions:**

1. How is the main support of a plant different from that of an animal?
2. Why is it important for plants to have a stem?
3. Why is it important for animals to have a spine/skeleton?

**Lesson Presentation:**

**Activating Prior Knowledge:**

1. Introduce/re-introduce students to a live plant. Ask what they remember/know about the body of the plant. (Answers will vary.)
2. Ask students to place their hands on their back. What do they feel? Why is the purpose of all of those small bones? (Answers will vary.)
3. Ask students if the plant and us/people/bones have anything in common?
4. Chart student responses on KWL chart or other graphic organizer.

**Modeled instruction:**

Human or Animal/Spine

1. Show the video of the [The Human Spine](https://www.youtube.com/watch?v=V4MLWJDL_a8) .
2. After viewing the video once, introduce new vocabulary (spine, skeleton) with visual supports.
3. Replay the video, pausing to emphasize vocabulary, spinal sections and purpose of the spine.
4. Encourage students to sing the chorus section of the song.

Plant/Stem

1. Show the video of the [Parts of a Plant: The Stem](https://www.youtube.com/watch?v=2klJcpdeEEc).
2. After viewing the video once, introduce new vocabulary (stem) with visual supports.
3. Replay the video, pausing to emphasize vocabulary, shape/size of the stem, and examples of plants in the video that show the stem.

**Supported/Guided instruction:**

1. Replay/review the videos and revisit vocabulary as needed.
2. Show images of plants and animals and have students decide which have stems and which have spines. Chart on chart paper or large graphic organizer.
3. Take students on a walk through campus and identify stems on plants.
4. For at home work, students can identify the spines on pets or other family members.

**Independent Work:**

1. Students will use a graphic organizer or other visual support to show the differences and similarities between stems/plants and spines/animals.
2. Students will categorize the structure of plants and animals in to 2 categories: those with stems and those with spines.

**Small Group Suggestions:**

1. Students can work in small groups to sort pictures of plants and animals.
2. Students can work in small groups to match pictures of those with stems and those with spines.
3. Students can identify stems on various plants on the school campus.
4. Students can dig deeper into content by reading an article on plants and/or animal structural systems and identifying main idea and/or key details in the text.

**Assessment:**

1. Students will show understanding of the similarities and differences between plant stems and animal spines.
2. Students will classify/categorize the support systems of plants and animals

2. Teachers should utilize district created rubrics to score student work.

**UDL:**

**Multiple means of representation:**

1. Students can use images of plants and animals in a graphic organizer to show similarities and differences.

2. Students can use a plant as a prop and show the location of the stem.

3. Students can draw a picture of a plant and label its stem.

4. Students can draw a picture of a human/animal and label its spine.

5. Students can match pictures of spines and stems to animals and plants.

6. Students can work individually, in pairs, or in a small group.

7. Students can work independently with peer or adult supports.

**Multiple means of expression:**

1. All students should have access to expressive language/technology that is appropriate for their specific need.

2. Expression may come in the form of verbal responses, signed responses, pointing/gestures, eye gaze, or through the use of a low or high tech device.

3. Text to speech options are available for computers on the Word app, iPads and other hand held devices. Google Chrome offers free extensions, such as Selection Reader and Select and Speak-Text to Speech, and apps, such as Text to Speech, Text to Speech with Google Drive, and TTS Reader- Unlimited Text-to-Speech.

4. Speech to text options are also available from Google. Extensions include Voice Note II-Speech to Text, Online speech recognition, and Co: Writer Universal. Voice Note II is also available as an app; Speech notes-Speech to Text Notepad is available as well. Microsoft Word also has speech to text options.

5. Additional information about text to speech and speech to text options are available through your district Assistive Technology Department.

**Multiple means of engagement:**

1. Provide students with choices of how to interact with materials.

2. Provide students or small groups with various places in the classroom in which to work, i.e. floor, desks, at the board.

3. Limit distractions in the work areas.

4. Encourage collaboration with peers in partners or small groups.

5. Allow students to work independently.

6. Allow students to be positioned for maximum learning engagement.

7. Provide students with additional materials, if necessary.

8. Provide supervision to students when working with plants.

9. Provide physical prompts when necessary.

**Assistive Technology Recommendations:**

1. All students should have a means of expressive communication and a way to be actively engaged in learning.

2. Response modes may include, but are not limited to: eye gaze, gesturing or pointing to pictures/words/phrases, signing, low tech devices (GoTalks, etc.), or dynamic devices (iPad, etc.)

3. Lesson vocabulary, photos/pictures and graphic representations should be created and/or printed prior to the lesson to provide all students with an opportunity to be engaged in discussion.

4. When possible, provide students with text to speech options. Articles and passages from Readworks.org have this option.

5. If students are writing in response to text or writing as a means of sharing information, provide students with alternates to pencils. Speech to text and alternative pencils should be considered. Find more information about alternative pencils here: [Weebly site for Alternative Pencils](file:///C%3A%5CUsers%5Cnicholsond%5CDesktop%5CSummer%20contract%202019%5C3-5%20Science%20Plans%202019%5Calternativepencils.weebly.com)

**Technology Needed:**

* Smartboard

**Additional Resources:**

* Video about plant stems with advanced vocabulary: [Plant Stems](https://www.youtube.com/watch?v=qTk0WL-KGVM)
* Science a-z.com: [Plant Life](https://www.sciencea-z.com/main/UnitResource/unit/58/life-science/grades-3-4/plant-life)
* Book: Skeleton Hiccups by Margery Cuyler
* Book: The Skeleton Book by Robert Winston
* Ducksters.com: [Bones and the Human Skeleton](https://www.ducksters.com/science/bones.php)
* Sciencing.com: [What Are the Functions of Plant Parts for Kids](https://sciencing.com/what-are-the-functions-of-plant-parts-for-kids-13426234.html)