Grade 4: Life Science Module

Lesson Sequence 11: Explanatory Model and Summative Assessment: Survival Argument

Lesson Sequence 11: Explanatory Model and Summative Assessment: Survival Argument

Overview

Total Time: 4 hours of instruction (divided into three sections, with Section 1 taking place over the course of multiple class meetings)

This is the final lesson of the module. Students use the engineering design cycle to create an explanatory model of a fictional but realistic animal and a drawing of the specific ecosystem in which the animal lives. Students then complete an on-demand summative assessment in which they argue that their designed animal has the necessary internal and eternal structures to survive well in either the grassland, desert, or tundra ecosystem. Finally, students reflect on the module and celebrate their learning by sharing their designed animals with an authentic audience such as their first-grade reviewers.

Module Guiding Question and Big Ideas

How do the internal and external structures of plants or animals function together as a system to help them survive well in a given habitat?

- For both plants and animals, the internal and external structures of an organism function together to ensure that the organism is able to obtain food, grow, avoid predators, and reproduce. These functions are all essential to an organism being able to survive well.
- Because all habitats have different hardships and available resources, the structures of the organism living there must be specialized for survival under those specific conditions. If any structure was removed from the organism, its system would be incomplete and it would not survive as well.

Long-Term Learning Addressed (Based on NGSS)

Construct an argument of how the internal and external structure of both plants and animals function together as a system to help them survive well in a given ecosystem. (Based on NGSS 4-LS1-1)

This lesson sequence explicitly addresses the following:

Science and Engineering Practices:

- **Developing and Using Models:** Develop a model or simple physical prototype to convey a proposed object, tool, or process. *Students design a fictional but realistic animal with specialized structures that help the animal thrive in a particular ecosystem based on evidence they have collected throughout the module. Note: This Science and Engineering Practice is not explicitly aligned with 4-LS1-1.*
- **Engaging in Argument from Evidence:** Construct and/or support an argument with evidence, data, and/or a model. *Students support the claim that their designed animal will survive well in a specific habitat using the explanatory model of their animal and evidence collected throughout the module.*

Crosscutting Concepts:

- **Structure and Function:** The way in which a living thing is shaped and its substructures determine its properties and function. *Students design an animal with specialized structures that will help it survive and thrive in a particular ecosystem. Note: This Crosscutting Concept is not explicitly aligned with 4-LS1-1.*
- **Systems and System Models:** A system can be described in terms of its components and their interactions. *Students describe how the structures of their designed animal work together as a system for survival.*

Disciplinary Core Ideas:

- **LS1.A Structure and Function:** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. *Students design an animal with specialized structures and construct an argument that the animal they created and the plants they chose have structures that will enable the organism to thrive in a particular ecosystem.*

Lesson Sequence Learning Target

- I can imagine and plan a realistic animal that has internal and external structures that help it to survive in a specific ecosystem.
- I can critique my partner's animal design and provide kind, helpful, and specific feedback.
- I can create an explanatory model of my animal and the plants that surround it that explains how structures work together to support survival.
- I can construct an argument to defend why my animal's specialized structures will allow it to survive in its ecosystem.

Ongoing Assessment

- Scientists Meeting: Making Meaning
- Performance Task: Animal Design Challenge Explanatory Model
- Summative Assessment: Survival Argument

Agenda

Total Time: 4 hours of instruction

Section 1

1. **Engineering Design Cycle**
   - A. Introducing the Challenge (10 minutes)
   - B. Imagining: Specialized Structures for the Animal (15 minutes)
   - C. Planning: The General Shape of the Animal (30 minutes)
   - D. Praise, Question, Suggestion: The General Shape of the Animal (15 minutes)

     Optional Extension: Focused Art Lesson
   - E. Creating: The Details of the Animal (30 minutes)
   - F. Praise, Question, Suggestion: The Details of the Animal (10 minutes)
   - G. Revising: The Final Drawing of the Animal (35 minutes)

     Optional Extension: Additional Rounds of Peer Critique

Section 2

1. **Developing and Using Models**
   A. Labeling the Explanatory Model (15 minutes)
2. **Engaging in Argument**
   A. Scientists Meetings: Making Meaning (20 minutes)
   B. Analyzing a Model Survival Argument (15 minutes)
   C. Summative Assessment: Survival Argument (30 minutes)

Section 3

1. **Communicating Information**
   A. Reflecting on Learning (5 minutes)
   B. Celebrating Learning (10 minutes)
   Optional Extension: Dim Award Ceremony

Teaching Notes

Purpose of lesson sequence and alignment with NGSS standards:

- This lesson sequence contains the summative assessment.
- In Section 1, students complete Part I of the assessment (the performance task). Students design a realistic but fictional animal. Using the Engineering Design Cycle, students create and revise an explanatory model (one of the Science and Engineering Practices) of their animal. They also draw the habitat in which the animal lives, including two plants. One of the plants must be grass.
- In Section 2, students layer on the labels of the explanatory model and explain how the structures of the plants and animals (a Disciplinary Core Idea) work together as system (a Crosscutting Concept) to help the organisms survive. In Part II of the assessment, students write an argumentative paragraph (another Science and Engineering Practice) about how the animal's internal and external structures function to support survival in a given habitat. The performance task and student paragraph are aligned with 4-LS1-1 and 3-LS4-3.

How it builds on previous work in the Life Science Module:

- Students draw upon their learning about the function of specialized structures in plants and animals from Lesson Sequences 3–10, learning about ecosystems from Lesson Sequences 1 and 2, and the same Engineering Design Cycle from Lesson Sequence 10 to complete their explanatory model and argumentative paragraph.

How it connects to the CCSS Standards and EL Education's Language Arts Grade 4 Module 2:

- When brainstorming possible structures to use for their fictional animal, students may wish to use similar structures to the animals they are familiar with from the Language Artsmodule.
- Students use the Praise, Question, Suggestion protocol in the Language Arts module.
- The Scientists Meeting in Section 2 provides students with the opportunity to practice their speaking and listening skills while collaborating in whole-group discussions (CCSS ELA SL.4.1).

- The student argument in Section 2 is an opportunity to formally assess a student's ability to construct an argument (CCSS ELA W.4.1).

Possible student misconceptions:

- As noted in previous lesson sequences, students may think that all characters in animated movies are real animals. Continue to reinforce/clarify that animators use the structures of real animals to design their characters but sometimes combine structures from multiple animals (including humans) to create characters.

Possible broader connections:

- Find an authentic audience to whom students can present their designed animals and background. Consider setting up a meeting with first-graders who can review the designed animals to determine whether or not they are realistic and why.
  - This module connects to NGSS Grade 1 Life Science Standard 1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Areas where students may need additional support:

- Students may need additional support providing their classmates with kind, helpful, and specific feedback. Use intentional grouping to ensure student success. Review the Praise, Question, Suggestion protocol with students as necessary. See the Classroom Protocols pack on Curriculum.ELeducation.org.
- Students may need more time to analyze the model survival argument. Consider providing additional models, including a model of an explanatory model.

Down the road:

N/A

In advance:

- Read each section and complete the Preparing to Teach: Self-Coaching Guide.
- Decide on an authentic audience for presenting the designed animals. Consider using first-grade students, local biologists, zoologists, upper-grade students, or parents.
- Consider meeting with the art teacher or other teachers with artistic experience to talk about ways to support students as they draw their animals.
- Decide whether to have students draw the plants for their performance task or to give them a printout of the plant (which would result in multimedia collage). Use the plant cards from Lesson Sequence 2 as images or to support students as they draw.
- Determine how best to have students co-construct the rubric for the performance task in Section 1. Decide whether students will fill in all four columns or if you will complete the rubric based on student ideas and your own grading requirements.
- Prepare technology necessary to play "Austin's Butterfly" <https://eleducation.org/resources/austins-butterfly> and "Inspiring Excellence Part 4" <https://eleducation.org/resources/inspiring-excellence-part-4-using-models-and-critiques-to-create-works-of-quality>.
- Gather the materials for the design challenge in Section 1.

- Review the Praise, Question, Suggestion protocol (see the Classroom Protocols on Curriculum.ELeducation.org).
  - For more information on the purpose of peer critique, watch the entirety of "Inspiring Excellence Part 4"; watch for suggestions for ways to structure peer critique.
- Post: Lesson sequence learning targets, Scientists Do These Things anchor chart, Concepts Scientists Think About anchor chart, Animal Structures and Functions anchor chart, Plant Structures and Functions anchor chart, Norms of a Scientists Meeting anchor chart, and Life Science Module guiding question.

Optional extensions:

- *Focused Art Lesson:* Invite an art teacher or animator to come in and give a specific lesson to the students.
- *Additional Rounds of Peer Critique:* Allow students to work with multiple peers to give and receive feedback to continue to improve the quality of their explanatory model.
- *Dim Award Ceremony:* Have the class (or the authentic audience) award a Dim Award to the student or team of students who had the most realistic animal.

Vocabulary

N/A

Materials

General Materials

- ☑ Performance Task: Animal Design Challenge Explanatory Model (from Lesson Sequence 1)
- ☑ Designed Animal and Plant Setting Rubric (one per student and one to display; co-constructed with students during Section 1)
- ☑ Designed Animal and Plant Setting Rubric (for teacher reference)
- ☑ Student science notebook (from Lesson Sequence 1; one per student)
  - Explanatory Model and Survival Argument entry (page 62 of the student science notebook)
- ☑ Animal Structures and Functions anchor chart (begun in Lesson Sequence 3)
- ☑ "Austin's Butterfly" (video; play in entirety)
- ☑ Animal cards (optional; from Lesson Sequence 2)
- ☑ Plant cards (optional; from Lesson Sequence 2)
- ☑ "Inspiring Excellence Part 4" (optional; video; play from 3:00–4:00)
- ☑ Peer Critique Checklist (two per student)
- ☑ Scientists Do These Things anchor chart (begun in Lesson Sequence 2)
- ☑ Plant Structures and Functions anchor chart (begun in Lesson Sequence 7)
- ☑ Norms of a Scientists Meeting anchor chart (begun in Lesson Sequence 1)
- ☑ Life Science Module guiding question (from Lesson Sequence 1; one to display)
- ☑ Teacher science notebook (from Lesson Sequence 1; one for teacher use)
- ☑ Concepts Scientists Think About anchor chart (begun in Lesson Sequence 2)

- ☑ Model survival argument (one per student and one to display)
- ☑ Summative Assessment graphic organizer (one per student and one to display)
- ☑ Summative Assessment: Survival Argument (one per student)

Science-Specific Materials

- ☑ Sticky notes (optional; 10 per student; for students to use during Section 1 and Section 2)
- ☑ Timer (optional; for teacher to use during Section 1)
- ☑ Materials for Animal Design Challenge Explanatory Model (enough for every student)
  - 8.5″ × 11″ blank paper
  - Colored pencils
  - Fine-tipped pen
  - permanent black marker.

Section 1: Engineering Design Cycle

A. Introducing the Challenge (10 minutes)

- Direct students' attention to the posted lesson sequence learning targets. Read them aloud as students follow along, reading silently in their heads:

  "I can imagine and plan a realistic animal that has internal and external structures that help it to survive in a specific ecosystem."

  "I can critique my partner's animal design and provide kind, helpful, and specific feedback."

  "I can create an explanatory model of my animal and the plants that surround it that explains how structures work together to support survival."

  "I can construct an argument to defend why my animal's specialized structures will allow it to survive in its ecosystem."
- Remind students that they have been learning about the structures and functions of plants and animals so that they can design an imaginary animal and setting with plants for Imagine Studios.
- Display the **Performance Task: Animal Design Challenge Explanatory Model** (1).
- Ask students to follow along as you read the task aloud. Answer any clarifying questions.
- Tell students that an authentic audience will be evaluating their final product. Share with students in your excitement that they will have a real audience to convince that their animal is real!
- Display the **Designed Animal and Plant Setting Rubric**. Tell students you are going to work together to fill in the specifics of the rubric. Ask students to turn and talk (2):

  "What does a designed animal need to have in order to be realistic?" (Structures that come from real animals.)

  "How can you convince someone that your animal can survive in a specific ecosystem?" (Include specialized structures that animals from that ecosystem really have.)

  "What makes something high-quality?" (Has had multiple drafts and revisions, is neat and well crafted)

- Cold call pairs to share out. Record students' ideas on the displayed Designed Animal and Plant Setting Rubric. Refer to the **Designed Animal and Plant Setting Rubric (for teacher reference)**.
- Tell students they will use the same Engineering Design Cycle they used in Lesson Sequence 10 "to create a high-quality model of a fictional animal. Explain that the model they will use to create their animal will be an explanatory model, which they have had lots of practice with in their student science notebook [3].

Preparing to Teach: Self-Coaching Guide

1. What authentic audience makes sense for my classroom? (See Teaching Notes for suggestions.)
2. What do I expect my students to say? What additional requirements do I want to have on the rubric?
3. If my students didn't participate in Lesson Sequence 10, what additional support will they need with the Engineering Design Cycle?

B. Imagining: Specialized Structures for the Animal (15 minutes)

- Refocus the whole group of students. Ask:

  "What functions are necessary for an animal to survive well enough to reproduce?" (obtain food, move (or stay stationary and blend in) including for protection/defense, sense environment, regulate temperature)

- Ask students to take out their **student science notebook** and open it to the **Explanatory Model and Survival Argument entry** on page 62.
- Focus students on the first section: Imagine. Encourage them to fill it out and reference the other entries in their notebook and the **Animal Structures and Functions anchor chart** to complete this section for their imagined animal [1].
- As students work, circulate and monitor for those who need additional support deciding on a specific structure.
- Remind students that they will have opportunities to revise their work, but they should make sure to consider what structures will help their animal survive in a specific ecosystem.

Preparing to Teach: Self-Coaching Guide

1. How can I support students as they imagine the possible structures they could include? What visuals might be helpful?

C. Planning: The General Shape of the Animal (30 minutes)

- Refocus the whole group of students. Tell them they are now going to plan the general shape of their animal [1].
- Tell students this is just the first step in drawing their animal. Share that planning, drafting, receiving feedback, and revising are all steps they will follow to create a high-quality final product.
- Show the **"Austin's Butterfly"** video to demonstrate the process of creating, receiving feedback, and revising. Encourage students to consider what Austin may have been feeling throughout the process as they watch the video [2].

- Using a total participation technique, invite responses from the group:

  "Based on the video, what was most important about the process that Austin went through to create his butterfly?" (Responses will vary: revising, receiving feedback.)

  "What might you consider borrowing from Austin's creation process to include in your own?" (Responses will vary.)
- Ask students to turn their attention back to the Imagine section of the Explanatory Model and Survival Argument entry.
- Remind students to use this list as they move to the Plan section and begin drawing the general shape for their animal.
- Encourage them to focus on just the general shape (outline) of their animal and not specific details [(3)].
- Circulate to provide students with specific drawing guidelines, such as the following:
  - Look at the whole page and get a sense of how much of the page should be filled with the illustration.
  - Use a pencil, not a pen.
  - Hold your pencil loosely and sketch light lines. Don't press hard and commit to a line at first. It's okay to have lots of sketchy lines on the page (without erasing the ones that are off).
  - Later, you can choose the lines that look best and darken them a bit.
- Address any clarifying questions and invite students to begin.
- As students draw, consider having the **animal cards** from Lesson Sequence 2 available for students to reference for specific structures.
- Once students have drawn the basic shape of their animal, ask them to choose what two plants they will include as the setting for their animal. Consider having the **plant cards** from Lesson Sequence 2 for students to choose from.
- Remind students that they should consider what plants will survive in their ecosystem and be prepared to explain why those plants will survive.

Preparing to Teach: Self-Coaching Guide

1. Based on the explanatory models from Lesson Sequences 5, 7, and 8, what will my students likely struggle with?
2. Based on the peer critique in Lesson Sequences 5 and 7, how positively do my students view peer critique? How can I use this video to help them have a vision of the power of peer critique?
3. How can I best support my students as they begin planning the general shape of their animals?

D. Praise, Question, Suggestion: The General Shape of the Animal (15 minutes)

- Remind students that Austin was able to create such an amazing butterfly because he received feedback from his classmates.
- Tell students they are going to use the Praise, Question, Suggestion protocol to provide their classmates with feedback that will help them improve the shape of their animals. Remind them that they have used this protocol in the Language Artsmodule. Review as necessary [(1)].

- Show students **"Inspiring Excellence Part 4."** Tell them that as they watch, they should pay special attention to the type of feedback that the students give, as well as how they say it.
- Remind students of the classroom norms for peer critique [(2)].
- Move students into pairs and distribute the **Peer Critique Checklist**. Explain that they will use the Praise, Question, Suggestion protocol to complete the checklist for their partner's drawing [(3)].
- Provide students with a few **sticky notes** to record their feedback to place on specific parts of their partner's drawing.
- Let students know that at this point, their feedback should be focused on the shape and structures of the animal.
- Ask students to begin the protocol. Consider using a **timer** to ensure that both students have adequate time to provide and share their feedback [(4)].

Preparing to Teach: Self-Coaching Guide

1. How well did my students do with peer critique in Lesson Sequences 5 and 7? What additional support will they need?
2. What are our norms for peer critique? (Suggestions: Be helpful, be kind, be specific.)
3. Will I designate peer critique partners, or allow students to choose their own partners? Will it be helpful to have students pair up with someone from the same ecosystem group?
4. What colleague or expert in my community might be able to give a focused art lesson at this point?

E. Creating: The Details of the Animal (30 minutes)

- Give students the **Materials for Animal Design Challenge Explanatory Model** for the next draft of their designed animal.
- Remind students to use the feedback they received from their peer to revise and improve the next iteration of their animal.
- Have students complete another draft of their drawing, this one with more detail [(1)].
- Encourage students to use the colored pencils to add the body coloration/covering to their animal.
- Once students have drawn their animal, instruct them to add the plants that they have decided to include in their background. Remind them that one of their plants should be a type of grass. See Teaching Notes.

Preparing to Teach: Self-Coaching Guide

1. How can I help students add more detail to their drawing?

F. Praise, Question, Suggestion: The Details of the Animal (10 minutes)

- Give students specific and positive feedback on their ability to use their partner's feedback to improve their drawing. (Example: "I am impressed with your ability to receive and readily implement feedback from your classmates.") Assure them that another round of peer critique will further help them improve their diagram.

- Ask students to move to sit with a different peer critique partner for this next round of feedback.
- Remind students of the norms for peer critique and ask them to use a blank Peer Critique Checklist to provide feedback on the details of their new partner's designed animal.
- Consider providing students with additional sticky notes to record their feedback.
- Answer clarifying questions and ask students to begin the Praise, Question, Suggestion protocol.
- Ensure that both students share their drawings and receive feedback for at least 5 minutes each.
- Have students complete their drawing or create another draft of their drawing based on feedback [1].

Preparing to Teach: Self-Coaching Guide

1. Would additional rounds of peer critique be helpful for my students?

G. Revising: The Final Drawing of the Animal (35 minutes)

- Have students complete the final drawing or create another draft of their drawing based on feedback [1].
- Encourage students to use the colored pencils to add the body coloration/covering to their animal and outline the animal and plants in **permanent black marker**.

Preparing to Teach: Self-Coaching Guide

1. How can I help the students make a final project that they are proud of?

Section 2: Developing and Using Models

A. Labeling the Explanatory Model (15 minutes)

- Remind students that for the performance task, they will create an explanatory model of a designed animal that has specialized structures to survive in a particular ecosystem [1].
- Direct students to the "Modeling" column on the **Scientists Do These Things anchor chart**.
- Ask:

  "What do you need to add to your drawings to make them an explanatory model, and to make sure they explain how your designed animal will survive?" (labels and details)
- Tell students they will now have a chance to label the specialized structures for obtaining food, sensing the environment, moving, and body coloration/covering on their animal [2].
- Remind students that they also need to add labels to their plants, explaining how the structures of the plants are specialized to survive in that particular ecosystem.
- Encourage students to reference their student science notebook, as well as the Animal Structures and Functions anchor chart and the **Plant Structures and Functions anchor chart** for accuracy in their labeling.
- Answer clarifying questions and ask students to begin labeling their drawings.

- After 10–12 minutes, invite students to turn and share their explanatory models with an elbow partner [3].

Preparing to Teach: Self-Coaching Guide

1. Based on the explanatory model I have assessed in the student science notebooks, where will my students need additional support?
2. Most students will benefit from using **sticky notes** to add the labels. That way they can do multiple drafts of the labels without ruining their final drawing.
3. How else can I support them as they create this final product?

Section 2: Engaging in Argument

A. Scientists Meetings: Making Meaning (20 minutes)

- Ask students to bring their science notebooks and gather for a Scientists Meeting.
- Remind students that a Scientists Meeting is a conversation where they speak to one another as scientists and not just to the teacher.
- Direct students' attention to the **Norms of a Scientists Meeting anchor chart** [1]:
  - We take turns talking.
  - We build on one another's ideas.
  - We disagree respectfully.
  - We ask questions when we don't understand.
- Share with students that the goal of this meeting is to organize their thinking around the **Life Science Module guiding question:**
  - "How do the internal and external structures of plants or animals function together as a system to help them survive well in a given habitat?"
- Remind students that they may use any part of their science notebooks to provide evidence for their thinking.
- Ask students to think about the module guiding question on their own for 3–4 minutes and to flip through their science notebook to find evidence to support their thinking.
- Invite students to turn and talk with an elbow partner:

  "How would you answer the module guiding question?" (Responses will vary.)
- Cold call several students to name the information the class collected to help them answer the guiding question.
- Then ask students to make meaning from the information. Ask questions such as:

  "Why do you think ...?"

  "What is your reason ...?"

  "What made you change your explanation?"
- Help students build on one another's ideas by asking questions such as:

  "Can someone paraphrase what X said?"

  "Who thinks something similar to what X thinks?"

"Who thinks something different from what X thinks?"

"Can you add to what X said?"

- If students struggle with formulating their ideas around the guiding question, consider breaking the question into smaller pieces such as these:

  "What is a system?"

  "What is the relationship between structure and function?"

- As students share out, capture their thinking in the **teacher science notebook**. When you see that the class is coming to some conclusions on the concept of systems, note them on the **Concepts Scientists Think About anchor chart** (at the bottom of the systems column). As you see fit, and as students draw conclusions about the overall concept of structure and function, add these ideas to the bottom of the Plant Structures and Functions anchor chart or the Animal Structures and Functions anchor chart.
- Give students specific positive feedback on their thinking about the module guiding question. To help students see their growth, share a few of the observations from earlier lessons captured in the teacher science notebook [(2)].
- Invite students to return to their seats.
- Refocus students on the Scientists Do These Things anchor chart. Draw their attention to the "Engaging in Argument" column.
- Tell students that soon they will be asked to create an argument based on the claim that their designed animal and the plants that surround it will survive in their given ecosystem.
- Ask a student to read aloud what the class has already added to the "Engaging in Argument" column.
- Tell students that they are ready to make a claim that the animals they designed have the necessary structures to survive well in a given ecosystem, and that they will have to collect evidence to support that claim and evaluate that evidence.
- Ask:

  "Where might you find evidence for what you have been learning?" (in science notebooks and on classroom anchor charts)

- Tell students that when they evaluate their evidence, they will consider whether or not they have enough evidence to support their claim (i.e., If someone disagreed with them, do they have enough evidence to support their view?). Because they have been learning all about structure and function, they should have plenty of evidence and reasoning to support their claim.
- Remind students that they should use their explanatory model as evidence.

Preparing to Teach: Self-Coaching Guide

1. How well have my students kept the norms of Scientists Meetings? How can I encourage them to further build on one another's ideas?
2. Did I record the initial Scientists Meeting in Lesson Sequence 1? How will I share this with the students now?

B. Analyzing a Model Survival Argument (15 minutes)

- Distribute and display the **model survival argument** [1].
- Tell students that this is a model argument about an animal that has been designed to survive in the rainforest.
- Explain to students that when they write their own argument, they will use a graphic organizer to help them make sure that they answer all parts of the prompt [2].
- Distribute and display the **Summative Assessment graphic organizer**.
- Tell students that they will work together as a class to check that the model survival argument answers all parts of the prompt, by making sure that all parts of the Summative Assessment graphic organizer can be filled in.
- Read the model survival argument aloud as students follow along, reading silently in their heads.
- Tell students you are going to read the model argument again, and this time you want them to pay attention to what evidence the author uses. Reread the model survival argument.
- Invite students to record the evidence used in the paragraph in the first row of the Summative Assessment graphic organizer. (black feathers, large eyes, sharp claws)
- Cold call a few students to share out what they recorded. Record student responses in the appropriate column of the graphic organizer.
- Tell students you are going to read the model survival argument aloud again, and this time you want them to pay attention to the reasoning the author uses.
- Invite students to record the reasoning provided for how the author's animal structures are specifically designed for the chosen ecosystem, and how the animal's structures work together as a system to support its survival in the second row of the Model Survival Argument graphic organizer.
- Cold call a few students to share out what they recorded. Record student responses in the appropriate column of the graphic organizer.
- Ask:

  "How did the author of the model argument explain whether he or she had enough evidence?" (talked about how the animal will get food and stay safe from predators)

- Using a total participation technique, invite responses from the group:

  "Do you think the author has enough strong evidence to support his or her claim?" (Responses will vary.)

- Point out to students that this model did not talk about all the structures of the animal. Rather, this author included the structures that were very important for the animal to survive well in the rainforest. Choosing the most important structures is an important part of evaluating evidence.

Preparing to Teach: Self-Coaching Guide

1. Some students may benefit from seeing an annotated version of the model paragraph. How will I make this available to them?
2. Based on the arguments that students have constructed in Lesson Sequences 2, 6, and 8, what additional support do students need to successfully write the assessment?

C. Summative Assessment: Survival Argument (30 minutes)

- Introduce the summative assessment with language such as: "You all have been working hard to do the work of scientists: to make arguments based on evidence. Today you are going to show what you know independently."
- Distribute and display the **Summative Assessment: Survival Argument** [(1)].
- Read it aloud as students follow along, reading silently in their heads.
- Continue to clarify the task:

  "You should defend why your animal will survive in the desert, grassland, or tundra."

  "Be sure to explain what evidence you have for making this claim, and discuss whether or not you have enough quality evidence for making this claim."
- Check for understanding: "Give a thumbs-up if you understand and have an idea about the evidence that you will use." Note students who are unsure about what they will write and follow up with them once students begin working independently.
- Have students take out their student science notebooks and the final drafts of their explanatory model (the designed animals with background plants). Encourage students to refer to these resources if they are helpful.
- Answer any clarifying questions.
- Invite students to move to their desks and begin writing [(2)].
- Collect students' writing to formally assess.

Preparing to Teach: Self-Coaching Guide

1. Some of my students may benefit from an additional copy of the Summative Assessment graphic organizer to scaffold their paragraph writing. For which students might this extra step be helpful?
2. Alternatively, some students may prefer to construct their argument orally. The Summative Assessment graphic organizer can help scaffold an oral argument as well. Which of my students may benefit from this option?

Section 3: Communicating Information

A. Reflecting on Learning (5 minutes)

- Invite students to turn to two elbow partners to create a triad.
- Ask them to discuss [(1)]:

  "What is the most interesting new learning about structures and functions in an organism from this module?"
- Post this prompt to support students' discussion: "I used to _____, but now I _____." (Example: "I used to think that plants and animals had nothing in common, but now I think they are similar because they all have specialized structures to help them survive.")

Preparing to Teach: Self-Coaching Guide

1. Will I capture this information in a public and visible way?

B. Celebrating Learning (10 minutes)

- Celebrate the end of the Life Science Module by having students share their designed animals with the previously chosen audience. One-on-one or in small groups [1]:
  - Students read the labels on the final draft of their designed animal and background plants aloud."
  - Students answer any questions from the audience about the animal or the plants surrounding it.
- Depending on the audience, consider setting up a structure for audience feedback. Example: "I like how you _____," and "I learned _____."

Preparing to Teach: Self-Coaching Guide

1. How can I ensure students have an authentic audience for this task? (See Teaching Notes for suggestions.)