

**Grade 3:** Life Science Module: Unit 1

# Lesson Sequence 1: Anchoring Phenomenon for Inherited Traits

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#### Overview

##### Total Time: 1.5 hours of instruction

Lesson Sequence 1 kicks off the Life Science Module with an anchoring phenomenon—a puzzling or engaging situation that creates a “need to know” for students, in this case, about how an organism’s traits are affected by inheritance and the environment and the effect that variation in traits has on survival, finding mates, and reproducing. The anchoring phenomenon for Unit 1 of this Life Science Module begins with students observing the diversity of organisms on earth through a video, a read-aloud, a classroom kinesthetic activity, and a slideshow. These make the students wonder: Why does an organism look the way it does, and why does it matter?



#### Unit 1 Guiding Question and Big Ideas

##### Why does an organism look the way it does, and why does it matter?

- Organisms look the way they do primarily because of the traits they inherit from their parents.
- The environment also affects an organism’s traits (Unit 2).
- The cycle of life—birth, growth, reproduction, and death—drives the phenomena of inheritance (Unit 2).
- The traits that organisms inherit will vary.
- Variation of traits, such as differences in color or size, can affect an organism’s likelihood of surviving, finding mates, and reproducing.

#### Long-Term Learning Addressed (Based on NGSS)

- Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. (Based on NGSS 3-LS3-1)
- Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. (Based on NGSS 3-LS4-2)

This lesson sequence does not explicitly teach any of the Science and Engineering Practices, Crosscutting Concepts or Disciplinary Core Ideas. See Teaching Notes.



#### Lesson Sequence Learning Target

- I can ask questions based on observations to find out more about why organisms vary in how they look.

## Ongoing Assessment

- Scientists Meeting: Gathering Ideas
- Student science notebook: Anchoring Phenomenon for Inherited Traits entry

## Agenda

**Total Time: 1.5 hours of instruction**

### Section 1

#### 1. Opening

- A. Reviewing Learning Target (5 minutes)
- B. Launching Student Science Notebooks (10 minutes)

*Optional Extension: Personalizing My Notebook*

#### 2. Obtaining Information

- A. Launching the Anchoring Phenomenon (10 minutes)
- B. Reading Aloud: *Bullfrog at Magnolia Circle* (15 minutes)
- C. Creating Body Graphs of Traits (20 minutes)
- D. Viewing Diversity of Organisms Slideshow (15 minutes)

*Optional Extension: Body Graph Bar Graph*

*Optional Extension: Local aquatic organism biodiversity*

#### 3. Asking Questions

- A. Scientists Meeting: Gathering Ideas (15 minutes)

## Teaching Notes

### Purpose of lesson sequence and alignment with NGSS standards:

- In this lesson sequence, students are introduced to the anchoring phenomenon for Unit 1, which is meant to activate student thinking and interest in the module guiding question, as well as to create a “need to know” for the long-term learning target. Because the purpose of this lesson sequence is to activate student thinking through the anchoring phenomenon, there are no Crosscutting Concepts, Science and Engineering Practices, or Disciplinary Core Ideas explicitly addressed. Students are asking questions (a Science and Engineering Practice), but this practice is not explicitly taught, nor are students expected to meet the rigor of formulating questions in the 3–5 grade level band. As students notice similarities and differences among traits of organisms, they are noting a pattern (a Crosscutting Concept). Again, this Crosscutting Concept is not explicitly taught at this point but will be in the following lessons. Both the guiding question and the long-term learning are aligned to 3-LS3-1 and 3-LS4-2 and by the end of the unit, students will meet the long-term learning and the guiding question.
- In the Opening, students familiarize themselves with the student science notebook. These notebooks will be used to structure students’ note-taking throughout the module. Take some time to introduce this practice. Use the professional science notebook entries to lend authenticity to the task. Note: The example professional science notebook entries are not to teach students something about a particular ecosystem but rather to show them the way that

professional scientists use a notebook. Focus students on structure so that students understand the purpose and usefulness of the notebook both for this module but also for scientists more generally. You may also want to give time for the students to personalize their notebooks.

- In Obtaining Information, students are introduced to the anchoring phenomenon—multiple images showing the diversity of life in a variety of settings. They watch a video and listen to a read-aloud of *Bullfrog at Magnolia Circle* to observe the diversity in one small, aquatic habitat. Students then participate in an activity to demonstrate the variation in traits within a species by creating body graphs based on the traits observed in their classroom; students also view a slideshow that depicts variation of traits within a species as well as within a family. Students begin to notice patterns in the variation of traits.
- Consider adding photos of your students' families to the Diversity of Organisms slideshow.
- In this lesson sequence, the teacher starts the teacher science notebook. Consider using a composition notebook or single-subject spiral notebook. This teacher science notebook serves two purposes. First, it serves as a model for collecting information in a science classroom. When taking notes in the notebook, be transparent and point out the practice to students. Consider saying something like: "This is very interesting. I'm going to collect this information in my notebook so I can refer to it later." Then, when you use the information collected, point it out to students by saying something like: "Three days ago, I heard X share an idea that I want to return to now." Second, the teacher science notebook serves as an additional record of student learning. Use the notes collected during Scientists Meetings and other class discussion time in conjunction with student work to guide instruction, create appropriate scaffolding, record student misunderstandings, and make connections between the science content and students' lives. Refer to it often.
- In this lesson sequence, students participate in their first Scientists Meeting, where the teacher can gather baseline information about what students know about inheritance, traits, variation, etc. The Scientists Meeting is a structure for classroom discussion that repeats throughout the module. Scientists Meetings provide an opportunity for students to make their thinking public and defend their ideas based upon evidence collected through experimentation, observation, or research. They also provide an opportunity for students to "rehearse" their ideas before writing. The teacher's role is to facilitate discourse among students through thoughtful questioning. See Key Features of the Life Science Modules in the introduction for more information.
- Both the student science notebook and the Scientists Meeting provide formative assessment data for the Crosscutting Concepts, Disciplinary Core Ideas, and Science and Engineering Practices aligned with 3-LS3-1 and 3-LS4-2.

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

- N/A: This is the first lesson sequence in the module.

### **How it connects to the CCSS Standards and EL Education's Language Arts Grade 3 Module 2:**

- In Language Arts Grade 3 Module 2, students read *Bullfrog of Magnolia Circle*.
- The student science notebook is an opportunity for students to practice informative writing and gathering evidence (ELA CCSS W.3.2 and W.3.8).

- The Scientists Meeting in Section 1 provides students with the opportunity to practice their speaking and listening skills while collaborating in whole group discussions (CCSS ELA **SL.3.1**).

**Possible student misconceptions:**

- Students may think that if a place (like Magnolia Circle) has many different species, it can become too crowded or unhealthy. In fact, biodiversity is one of the indicators of a healthy environment.

**Possible broader connections:**

- Connect to student lives by discussing the number of plants that can be found locally. Local statistics can be found at <http://plants.usda.gov/java/>.

**Areas where students may need additional support:**

- Students may need additional support using their student science notebook. Consider showing them models of completed notebooks. Highlight the structure of the notebook. Teacher directions are on the left-hand side of the page; students add their thinking to the right-hand side. See Key Features of the Life Science Modules in the introduction for additional information.
- Students may need additional support during the body graph activity to notice and name differences respectfully. The activity is designed for students to notice and name inherited traits such as freckles, dimples, attached/detached ear lobes, hair color, eye color, and size of hands and feet. Consider various approaches to discussing differences and select those that feel comfortable and respectful in your classroom culture. Research to make sure discussing certain traits, e.g., skin color and weight, is not taboo or inflammatory. Invite students to help you create a list of criteria they would like to graph, and consider giving them the choice to reflect privately or make participation voluntary. Establish an environment of acknowledgment and celebration.
- Students may need additional support during the body graph activity to create straight, evenly spaced lines so that the length of the lines can be compared like a bar graph. If you are in a tiled classroom or hallway, consider having students line up with one student standing on each floor tile so that spacing is the same for all lines being compared.
- Students may need additional support when participating in the Scientists Meeting if this is a new routine in your classroom. Speak transparently with students about expectations and the purpose of the Scientists Meeting. For students who need additional support organizing their ideas in conversation, provide discussion questions from the Scientists Meeting in advance and provide ample processing time.

**Down the road:**

- Students will continue to use the student science notebook and may need support keeping track of this important material. Consider where and how you will have students store it so they can work on it and refer to past entries.
- Students will continue to participate in Scientists Meetings throughout the module. Support students as they familiarize themselves with the routines and expectations surrounding this kind of discussion.

- In Lesson Sequence 2, students will use water lilies. If possible, obtain four sibling water lilies grown from seed from the same parent plant. If not possible, use the pictures in the supporting materials.
- The list of organisms recorded during the read-aloud of *Bullfrog at Magnolia Circle* in this lesson sequence will be used again during Lesson Sequence 3. Consider recording this list in the teacher science notebook or on a piece of chart paper.
- In Lesson Sequences 2 and 3, students will be looking at differences and similarities in the traits of siblings and parents. Consider inviting students to bring in a picture of their siblings and/or parent and child. Be sensitive to students who are not living in biological families.

### In advance:

- Read each section and complete the Preparing to Teach: Self-Coaching Guide.
- Prepare:
  - Student science notebooks; consider where students will store them in the classroom so they will be readily available
  - Teacher science notebook
  - Image of professional science notebook
  - Norms of a Scientists Meeting anchor chart (see supporting materials)
  - Diversity of Organisms Slideshow, or print out photos from the Diversity of Organisms slideshow in color (see supporting materials)
  - Technology necessary to play “20 Years of Nature’s Best Photography” (<https://www.youtube.com/watch?v=cdG2d46fPh8>) and slideshow from Ian Plant (see supporting materials)
- Review the Turn and Talk protocol (see Classroom Protocols pack on Curriculum.ELeducation.org).
- Post: Life Science Module Unit 1 guiding question, lesson sequence learning target, Norms of a Scientists Meeting anchor chart.

### Optional extensions:

- *Optional Extension: Personalizing My Notebook:* Let students decorate their science notebooks or attach an additional cover. For suggestions, see <http://www.calacademy.org/educators/teacher-perspectives-value-science-notebooking>.
- *Body Graph Bar Graph:* Have students create a bar graph of the data collected from the body graphs conversation. For example, use data about shoe size to create a bar graph on graph paper.
- *Local aquatic organism biodiversity:* Students can research the number of aquatic organisms that reside locally.

## Vocabulary

**species:** a group of animals or plants that are similar and can produce offspring

**traits:** a characteristic of an organism

**habitat:** the natural home of an organism where its needs for food, water, shelter, and space are met

**organism:** a living thing, like a plant or animal

**aquatic:** living in or found near water

**biodiversity:** the amount of differences within a species; the number of different species in a location

**amphibian:** an animal that lives on both land and water

## Materials

### General Materials

- ✓ Unit 1 guiding question (one to display)
- ✓ Professional science notebook (one to display)
- ✓ Student science notebook (one per student)
  - Anchoring Phenomenon for Inherited Traits entry (page 2 of student science notebook)
- ✓ Anchoring Phenomenon Directions (for teacher reference)
- ✓ “20 Years of Nature’s Best Photography” (video; play 9:30–12:16; see Teaching Notes)
- ✓ Data about Diversity on Earth (one to display)
- ✓ *Bullfrog at Magnolia Circle* (one to display; for teacher read-aloud)
- ✓ Diversity of Organisms slideshow (new; teacher-created; see supporting materials)
- ✓ Norms of a Scientists Meeting anchor chart (new; teacher-created; see supporting materials)

### Science-Specific Materials (gathered by the teacher)

- ✓ Teacher science notebook (for teacher reference; see Teaching Notes)

## Section 1: Opening

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### A. Reviewing Learning Target (5 minutes)

- Direct students’ attention to the posted **Unit 1 guiding question** and read it aloud.
  - “Why does an organism look the way it does, and why does it matter?”
- Tell students that over the next few weeks they will be working to answer this question.
- Direct students’ attention to the posted lesson sequence learning target and read it aloud:
 

***“I can ask questions based on observations to find out more about why organisms vary in how they look.”***

- Tell students that they are going to be doing the work of scientists in this Life Science Module and that as scientists they are going to be making observations and then asking questions about these observations.
- Ask students to turn and talk to an elbow partner. Remind students that they use this kind of sharing technique in the EL ELA modules. Review as necessary <sup>(1)</sup>.

*“What do you think will be easy and hard about meeting this lesson sequence learning target?” (Responses will vary.)*

### Preparing to Teach: Self-Coaching Guide

1. What experience do my students have with Notice/Wonder or a similar question-generating protocol? Could I leverage that experience here?

#### B. Launching Student Science Notebooks (10 minutes)

- Tell students that in order to answer the Unit 1 guiding question they will need to gather information. When scientists gather information, they collect it in a science notebook <sup>(1)</sup> <sup>(2)</sup>.
- Display the **professional science notebook** to provide authenticity for the work that students will be completing. Encourage students to notice and name one thing they notice about the information in the notebook.
- Distribute **student science notebooks**. Tell students that just like professional scientists, they will record their questions, thinking, and learning for this unit in a notebook <sup>(3)</sup>.
- Because this is a new tool for students with a unique format, ask students to flip through their student science notebook and think of one “notice” and one “wonder” about how the notebook is set up or what they see inside.
- After students have had a minute to consider, invite them to turn and talk:  
*“What is one thing you notice and one thing you wonder about the student science notebooks?” (Responses will vary.)*
- As needed, respond to student questions and wonders. Be sure students understand that the right-hand side of the page is for them to write their ideas, questions, draw pictures, and any information they learn. Assure them this is their notebook. You will occasionally collect it to look at some of their thinking, but it is mostly for them to keep a record about what they are learning <sup>(4)</sup> <sup>(5)</sup> <sup>(6)</sup>.

### Preparing to Teach: Self-Coaching Guide

1. Have I used a student notebook in my classroom before?
2. How is this similar to or different from what I’ve done before?
3. Do I have a student model that would be useful to students?
4. How often will I collect the science student notebook?
5. How will I help students keep track of the notebook?
6. How will I help students who are absent catch up with notebook entries?

## Section 1: Obtaining Information

### A. Launching the Anchoring Phenomenon (10 minutes)

- Ask students to move so that they can view a video.
- Ask them to open their student science notebook to the **Anchoring Phenomenon for Inherited Traits entry** and find the “Obtaining Information” section.
- Tell students that, like scientists, they are going to observe closely so they can obtain information about how many different organisms there are and think about differences and similarities among these organisms. To do this, they will watch a video.
- Encourage students to use the Diversity of Organisms graphic organizer in the “Obtaining Information section” of the student science notebook to record general observations and questions as they view the video.
- Referring to the **Anchoring Phenomenon Directions (for teacher reference)** as a guide, show students the “**20 Years of Nature’s Best Photography**” video and the Ian Plant images <sup>(1)</sup> <sup>(2)</sup>.
- After viewing the video, ask students to turn and talk with an elbow partner:  
*“What have you noticed so far in the video?” (Responses will vary but may include observations about how different animals are from each other)*
- Display **Data about Diversity on Earth** (or write these numbers on the white board) and ask:  
*“What surprises you about the number of different species?” (There are millions of different animals, and lots in just the United States.)*
- Clarify that a *species* is the type of plant or animal. Students are members of the human species. A golden retriever and a poodle are both dog species. If animals are in the same species, they are in the same group and can produce offspring. A poodle and golden retriever could have puppies together, but a golden retriever and a gerbil are not in the same *species* and could not have babies.

### Preparing to Teach: Self-Coaching Guide

1. How will I prepare the video to ensure that all students can see and hear well?
2. Do I have time to play the video multiple times?

### B. Reading Aloud: *Bullfrog at Magnolia Circle* (15 minutes)

- Gather students in a circle for a read-aloud <sup>(1)</sup>.
- Ask:  
*“What do you already know about where frogs live?” (Responses will vary but could include: a pond, the zoo, a garden, the forest.)*
- Define where a frog lives as its *habitat*.

- Remind students that they have just learned from the video that there are hundreds of thousands of species or groups of plants and animals on earth. Within a single habitat there are many different species as well.
- Tell students you are going to read aloud an excerpt from *Bullfrog at Magnolia Circle*—a text that are familiar with from their Grade 3 ELA module. As they listen, they should try to make close observations about the different species that are present in the bullfrog’s habitat.
- Read *Bullfrog at Magnolia Circle* aloud, pausing after each page for students to name the animals that they see in the bullfrog’s habitat. Ask <sup>(2)</sup>:  
**“Do these animals belong to the same species?” (Responses will vary.)**
- Record species that are named in the **teacher science notebook** or on a piece of chart paper to be referenced in Lesson Sequence 3.
- As you read the book, draw students’ attention to examples of various stages of the bullfrog life cycle. Ask:  
**“What type of place do you think the bullfrog is looking for when he looks for a ‘calling site?’” (Responses will vary but could include: He’s looking for other frogs.)**
- At the conclusion of the book, discuss with students the number of different species that live in the *aquatic* habitat that is depicted in *Bullfrog at Magnolia Circle*. Say: “There aren’t just frogs and fish in a pond. Did you expect this many different species that belong to live in a pond? There are many more species that live in a pond than you may see in just one visit.”
- Record student ideas in the teacher science notebook.
- Explain that *biodiversity* is the diversity or the differences of living things. This includes differences we can see within species, among species, and the number of different species in a location.
- Explain that biodiversity is very important and scientists think that biodiversity within a habitat or a species is a positive sign.
- Encourage students to return to the Diversity of Organisms graphic organizer in their student science notebook and the record their general takeaways or questions about variation among different species <sup>(3)</sup>.

### Preparing to Teach: Self-Coaching Guide

1. Depending on how familiar my students are with the text, I may need more time for this activity. How much time do I think it will take?
2. To connect the wondering of students to the guiding question, what questions can I ask?  
 (“Do you think it matters that this X looks this way? Could this organism be any color/size/shape? Why does it matter?”)
3. To support my students’ questioning, what questions can I model?

### C. Creating Body Graphs of Traits (20 minutes)

- Refocus whole group.
- Tell students that they are all part of the human species. But they are each an individual *organism* that is a part of the human species. An organism is an individual living thing—both plants and animals are organisms <sup>(1)</sup>.

- Ask students to look around the room at one another and make observations about specific *traits*, or characteristics, of an organism within the same species. Ask:
  - “What do you notice about your classmates?” (hair color, eye color, height)***
  - “What hair colors do you see in our classroom?” (black, brown, blond, red)***
  - “What do you notice about heights of people in our classroom?” (Some are short and some are tall.)***
  - Who has freckles (or dimples)? (Responses will vary.)***
- Then, say:
  - “Wow! We’re all the same species but because we are different organisms, we don’t look exactly the same. Why do you think we all look so different?” (Responses will vary but may include: different moms and dads, from different places.)***
- Facilitate a whole class discussion by eliciting student thinking using prompts such as:
  - “Tell me more about that.”***
  - “Give an example.”***
  - “Do others agree or disagree?”***
  - “Can you add to that idea?”***
- Explain to students that the differences and similarities they have noticed are all kinds of *traits*, or characteristics, of an organism.
- Tell students they will now explore differences in traits further by creating a “body graph” to compare different traits <sup>(2)</sup> <sup>(3)</sup> <sup>(4)</sup>.
  - Choose a trait and have students line up according to that particular trait. Example: Students with size 13 shoes stand in a line; next to that line have all students with size 1 shoes; next to that line have all students with size 2 shoes; and so on with all shoes sizes in the room.
  - Have students compare the size of each line <sup>(5)</sup>.
  - As time allows, repeat this process with other traits, such as color of hair, eye color, freckles, dimples, detached or attached ear lobes, etc <sup>(6)</sup>.
- Refocus students whole group. Ask:
  - “How did this activity help you see similarities and differences among the organisms of the human species?” (The lines we made with our bodies made it easier to see what traits were most common or most uncommon.)***
- Ask:
  - “Would a body graph of a different third-grade classroom look exactly the same as our body graphs did? Why or why not?”***
- Have students return to the “Obtaining Information” section of their student science notebooks and record their general takeaways or questions about variation of organisms within the same species from the body graphs activity.

### Preparing to Teach: Self-Coaching Guide

1. How can I further clarify the terms *organisms* and *species*?
2. Consider having students begin the activity seated on the carpet in a circle or a space where students can easily see one another. What area of the classroom is best suited for students to be able to move around freely and get into long lines?
3. If the classroom is crowded, is there a hallway or other alternative space?
4. How will I introduce the vocabulary of *traits*? (At this point it is not important for students to say the correct answers; instead encourage student questioning and wondering about the word.)
5. How will I discuss diversity of traits in a respectful manner in my classroom?
6. My students may need a mirror to check their eye color or ear lobes or dimples.

#### D. Viewing Diversity of Organisms Slideshow (15 minutes)

- Remind students that they have learned that scientists think that biodiversity is very important. Tell students that they are now going to view a slideshow about other species besides humans. First, they will learn about organisms that are all of the same species (like humans are all of the same species) and then organisms that are all in the same family <sup>(1)</sup>.
- Guide students through the “variation within a species” section of the **Diversity of Organisms slideshow**. As students view the pictures, ask:  
*“What do you notice?” (They look similar, but there are some differences too.)*
- Guide students through the “variation within a family” section of the slideshow. Tell them they are now viewing pictures of different families.  
*“What similarities and differences do you notice among the members of each family?” (similarities and differences in hair color, skin tone, and face shape or markings of animals)*  
*“Why do you think they look the way they do?” (Responses will vary, but some students may say they look like their parents or they look like other cows. Do not correct students at this point.)*  
*“What do you notice about the way the children look as compared to their parents?” (The children look similar to their parents but not exactly the same.)*
- Identify student misconceptions. At this point, do not correct student-thinking; instead, note it in the teacher science notebook to be addressed in future lessons.
- Invite students to return to the “Obtaining Information” section of their student science notebook and record their general takeaways from the slideshow.

### Preparing to Teach: Self-Coaching Guide

1. Can I add a photo of myself with a family member that I look similar to and different from?

## Section 1: Asking Questions

### A. Scientists Meeting: Gathering Ideas (15 minutes)

- Ask students to bring their student science notebooks and gather for a Scientists Meeting <sup>(1)</sup>.
- Gather students in a whole group area on the floor.
- Explain to students:
  - They are starting a routine they will continue throughout the module.
  - This is a special class conversation where they talk about important science concepts and the new concepts they are learning.
  - They should always gather in a circle and be respectful of one another’s space.
  - They will be using the things they write in their student science notebook to help them explain their ideas, so they should always bring their notebook to the meeting.
- Tell 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** and read it aloud <sup>(2)</sup>:
  - 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 today’s Scientists Meeting is to gather ideas and questions about the Unit 1 guiding question <sup>(3) (4) (5) (6)</sup>.
- Ask students to discuss with an elbow partner:
 

***“What are your thoughts and wonders about the appearance of organisms so far?” (Responses will vary but may include: Why do siblings look different from each other? Why do siblings have similarities? How does the way a plant or animal looks affect how it is able to live?)***
- Ask pairs to share out; capture their ideas in the teacher science notebook.
- As students share out, push them to provide evidence for their ideas:
 

***“What have you seen, heard, or read that makes you think that?” (Responses will vary, but students should draw on personal experiences and learning.)***

***“What experience have you had that supports that idea?”***
- Ask questions to help students connect their ideas:
 

***“Does anyone have a possible answer to that question?”***

***“Do others agree or disagree? Why?”***

***“Can someone paraphrase what Student A said?”***
- Encourage students’ wondering and questioning at this point rather than focusing on correct answers <sup>(4)</sup>.
- Record student responses and questions in the teacher science notebook, being sure to think aloud and model for students the habit of recording questions and thinking that will be returned to later.

- After 10 minutes, draw students' attention to the Unit 1 guiding question again and read it aloud:
  - “Why does an organism look the way it does, and why does it matter?”
- Invite students to return to their seats.
- Provide students with time to write their ideas and highlights from the Scientists Meeting in their student science notebook in the “Gathering Ideas” section in the Anchoring Phenomenon for Inherited Traits entry. Encourage students to include evidence to support their explanation <sup>(7)</sup>.
- Let students know that in the coming lessons they will spend a significant amount of time investigating why organisms look the way they do and why it matters in the coming lessons, and that you look forward to seeing how students' ideas change and grow over time.
- At the end of the conversation, direct students' attention to the Norms of a Scientists Meeting anchor chart. Briefly discuss how well the class kept the norms of the Scientists Meeting. Congratulate students on their ability to keep the norms of the Scientists Meeting. Offer specific feedback to students. (Example: “I saw you building on her ideas when you\_\_\_). Invite students to turn and talk about the specific norms they kept well today <sup>(8)</sup>.

### Preparing to Teach: Self-Coaching Guide

1. A Scientists Meeting is different from a regular group discussion. Review the context and purpose in Key Features of the Life Science Modules in the introduction.
2. What group norms will I emphasize?
3. Will I capture students' question publicly, or in my notebook?
4. Remember that at this point I want to gather information about what the students already know about the Disciplinary Core Ideas of inheritance of traits and variation. I do not need to define them yet.
5. What do I anticipate they will know?
6. How will I capture this valuable information about students' prior knowledge?
7. This explanation can serve as good baseline data for how well my students construct explanations.
8. How much practice do my students have with self-evaluation? Will they need a more structured way to reflect on how well they kept the norms?