

Grade 3: Life Science Module: Unit 1

Lesson Sequence 4: Inheritance of Traits

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Overview

Total Time: 2.5 hours of instruction (divided into two sections)

In this lesson sequence, students build on their understanding of the importance of reproduction. They learn that reproduction occurs between a male and a female of the same species. Students learn that variation in traits of both plants and animals is a result of inheriting traits from both a mother and a father. Students apply their learning by using the pictures of a male and female frog to identify the potential combination of inherited traits in a frog offspring.



Lesson Sequence Focusing Question and Big Idea

What patterns in appearance exist between offspring and their parents?

- *Offspring inherit traits from both parents, which causes them to look similar to their parents but not exactly the same as either parent.*

Long-Term Target Addressed (Based on NGSS)

Construct an explanation of the observed relationship that offspring inherit traits, such as eye color or leaf shape, from both of their parents. (Based on NGSS 3-LS3-1)

This lesson sequence explicitly addresses:

Science and Engineering Practices:

- **Constructing Explanations:** Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem. *Students construct an explanation that a frog looks the way it does because it inherits traits from its mother and father.*

Crosscutting Concepts:

- **Patterns:** Patterns can be used as evidence to support an explanation. *Students have already identified the pattern that family members look similar but not exactly the same. In this lesson, they will specifically consider the patterns in appearance between offspring and their parents and will use that pattern to explain that inheritance of traits from two parents causes offspring to look similar to yet different from both parents and apply this explanation to make a prediction about possible offspring from two frog parents.*

Disciplinary Core Ideas:

- **LS3.A Inheritance of Traits:** 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. *Through the Finding Frog Mates game, students learn that inherited traits come from both a mother and a father through the process of reproduction. Students create a data table to demonstrate the variation of possible frog offspring from two parent frogs.*

**Lesson Sequence Learning Target**

- I can construct an explanation for why an organism looks similar to yet different from its parents.

Ongoing Assessment

- Student science notebook: Inheritance of Traits entry
 - Constructing an Explanation: Frog Offspring Possible Inheritance
- Student science notebook: Life Cycle entry (from Lesson Sequence 3)
 - General Pattern of Life Cycle model
- Scientists Meeting: Building Understanding

Agenda**Total Time: 2.5 hours of instruction***Section 1***1. Opening**

- A. Reviewing Learning Target and Focusing Question (10 minutes)

2. Carrying Out an Investigation

- A. Finding Frog Mates (20 minutes)

3. Obtaining Information

- A. Reading about Inheritance (30 minutes)

*Section 2***1. Constructing an Explanation**

- A. Creating Frog Offspring after the Pattern of Inheritance (25 minutes)
- B. Back-to-Back and Face-to-Face: Constructing an Explanation (20 minutes)

*Section 3***1. Evaluating and Communicating Information**

- A. Scientists Meeting: Building Understanding (30 minutes)
- B. Returning to the Life Cycle Diagram (15 minutes)

Teaching Notes

Purpose of lesson sequence and alignment with NGSS standards:

- In this lesson sequence, students learn that organisms vary in how they look because they inherit (a Disciplinary Core Idea) traits from a male and female parent.
- In Section 1, students learn that reproduction depends on a male and female organism. Through reading “Why Do I Look Like This?” they learn the reason organisms look similar to but not exactly like their parents (a pattern they noted in Lesson Sequence 2). The reason is that organisms inherit traits from two parents.
- In Section 2, students look closely at frog parent photos and predict what physical traits the offspring may have. Then they design one of the frog offspring. They use the Inheritance table in their student science notebook, “Why Do I Look Like This?”, and/or the pattern (a Crosscutting Concept) they identified in Lesson Sequence 2 as evidence as they construct an explanation (a Science and Engineering Practice) for why their frog offspring looks the way it does.

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

- This lesson sequence builds on learning from Lesson Sequence 2 in which students noticed the pattern of difference and similarity that exists in the traits of members of the same family. In this lesson sequence, students learn why this pattern occurs.
- Students continue to focus on aquatic organisms though they also discuss how these concepts can be applied to other organisms as well.

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

- Back-to-Back and Face-to-Face is a protocol that students use in Language Arts Grade 3 Module 2.
- The close read in Section 1 provides students with the opportunity to practice reading informational texts (CCSS ELA RI.3.3).
- The student explanations in Section 2 are an opportunity for students to write informatively (CCSS ELA W 3.2.).
- 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.3.1).

Possible student misconceptions:

- A common misconception is that organisms inherit traits only from their mothers or that male organisms inherit traits only from their fathers. In reality, organisms inherit traits from both their mother and their father. In order to address this misconception, point out similarities in traits between mother and offspring as well as father and offspring.
- In Carrying Out an Investigation in Section 1, both students in the pair are given shakers. Only one student should be the shaker while the other student seeks out that frog; the seeker also carries a shaker only so that he/she knows what sound to try to match. This is important because in frog mating only the male frog calls while the female frog seeks out her mate.

- Some frog species are sexual dimorphic—that is, the females and males look very different from each other. Therefore, the offspring will look very similar to the same-sexed parent and will not inherit a mix of obvious physical traits from both the male and female parents. Because the purpose of this lesson is to teach students a basic rule of biology—that because of sexual reproduction, genetic material is inherited from both the male and female parent—this lesson purposefully does not complicate inheritance with sexual dimorphism.

Possible broader connections:

- N/A

Areas where students may need additional support:

- Families are increasingly diverse, with students coming from many different ethnic, racial, and cultural backgrounds. Family configurations are also varied and may include foster children, adoptive families, single parent families, racially mixed families, and same-sex parents. It is important to know your students' backgrounds and be sensitive to the students in your class who may not live with their biological parents.
- 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.
- Students will closely read a text in this lesson sequence. Some students may benefit from additional support. Consider these options:
 - Offer selected shorter passages to specific groups based on the readiness and needs of the group. This gives students an opportunity to read a complex text within the 3rd grade level span but differentiates the length of the text, not the complexity.
 - For ELLs and students who may need additional support with reading and/or writing: Strategically pair students with a peer model.
 - For students who may need additional support determining the gist: Consider highlighting or underlining key phrases in their individual copy of the text in advance. This will lift the gist up for them.

Down the road:

- In the Unit 1 summative assessment in Lesson Sequence 6, students independently draw a frog offspring from a photo of frog parents and construct an explanation for why the frog offspring looks the way it does and if it would or would not survive. The work in this lesson sequence provides important practice for students and can be used as formative assessment for student understanding of why organisms look the way they do.

In advance:

- Read each section and complete the Preparing to Teach: Self-Coaching Guide.
- Print the Frog Parent cards in color. Be sure that you have enough colored pencils so that each student will have the colors to match the frog parent cards he or she receives (blue, yellow, black, etc.).
- Collect materials for making frog call shakers. Create two shakers that make the same sound. Then create another two shakers that have a different sound. Do this for each set of shakers until you have made enough for each student in the class to have his/her own shaker.

Repeats are fine, as long as there is a match for every shaker. You may want to inconspicuously mark the pairs or create a key to help students who need help identifying their pair by more than sound alone.

- Create the model frog offspring using the model Inheritance table (see supporting materials).
- Prepare technology necessary to play “Frog Calls” (<http://animaldiversity.org/site/topics/frogCalls.html/>). Decide whether you will play one frog call at a time or many different frog calls at once.
- Determine partnerships for Section 1.
- Make copies of “Why Do I Look Like This?”
- Post: Unit 1 guiding question, lesson sequence learning targets, Concepts Scientists Think About anchor chart, Scientists Do These Things anchor chart, Inheritance anchor chart, and Norms of a Scientists Meeting anchor chart.

Optional extensions:

- N/A

Vocabulary

offspring: another name for a plant or animal’s baby or “young”
male: men or boys; cannot bear children or lay eggs; plant part that has pollen
female: women or girls; can bear children or lay eggs; plant part that becomes the seeds
species: a group of animals or plants that are similar and can produce offspring
mate: when male and female organisms reproduce
reproduce: when male and female parents produce offspring
trait: a characteristic of an organism
inherit: to get something from parents

Materials

General Materials

- ✓ Student science notebook (from Lesson Sequence 1; one per student)
 - Inheritance of Traits entry (page 16 of student science notebook)
 - Life Cycle entry (from Lesson Sequence 3; page 10 of the notebook)
- ✓ Concepts Scientists Think About anchor chart (begun in Lesson Sequence 2; added to in Section 2; see supporting materials)
- ✓ “Frog Calls” (audio; play various clips; see Teaching Notes)
- ✓ Frog Parent cards (one per pair)
- ✓ “Why Do I Look Like This?” (one per student)
- ✓ Inheritance anchor chart (begun in Lesson Sequence 2; added to in Section 1; see supporting materials)
- ✓ Scientists Do These Things anchor chart (begun in Lesson Sequence 2; added to in Section 2; see supporting materials)
- ✓ Model frog parents picture (one to display)

- ✓ Model Inheritance table (one to display)
- ✓ Frog Offspring Outline (one per student)
- ✓ Colored pencils (at least four per pair; see Teaching Notes)
- ✓ Model frog offspring (new; teacher-created; see Teaching Notes)
- ✓ Norms of a Scientists Meeting anchor chart (begun in Lesson Sequence 1)
- ✓ Unit 1 guiding question (from Lesson Sequence 1)

Science-Specific Materials (gathered by the teacher)

- ✓ Materials for frog call shakers (one shaker per student; see Teaching Notes)
 - Film canisters, prescription bottles, or plastic eggs
 - Materials to put in each canister: sand, paper clips, beads, dry beans, popcorn, rice, small and dry pasta noodles

Section 1: Opening

A. Reviewing Learning Target and Focusing Question (10 minutes)

- Invite students to open their **student science notebook** to the **Inheritance of Traits entry**⁽¹⁾.
- Direct students' attention to the posted lesson sequence learning target and lesson sequence guiding question and read them aloud:
 - *"I can construct an explanation for why an organism looks similar to yet different from its parents."*
 - What patterns in appearance exist between offspring and their parents?
- Remind students that they have looked for patterns before, and draw students' attention to the examples for "Patterns" that they added to the **Concepts Scientists Think About anchor chart** during Lesson Sequences 2 and 3.
- Provide students with time to jot down their own ideas about the focusing question and learning target in their student science notebook in the Inheritance of Traits entry under the "Opening" section.

Preparing to Teach: Self-Coaching Guide

1. How will I be sensitive to my students who are not living with their biological parents?

Section 1: Carrying Out an Investigation

A. Finding Frog Mates (20 minutes)

- Tell students you are going to play a variety of frog calls from different *species* of frogs. Ask students to listen closely so they can describe what they hear.
- Play **"Frog Calls"** for students.
- Ask students to turn and talk with an elbow partner after each call:
 - "How would you describe the frog call?" (Responses will vary.)*

- Tell students this is what many scientists, called field biologists, do when they want to know what frogs live in an area. Because frogs are hard to see, they go and listen for all the different frog sounds they can hear. When they hear the noise a frog makes, the field biologists know what species of frog is in the area.
- Tell students that these are the sounds that *male* frogs make when they want to find a mate. When the *female* frog hears these sounds, she can then go and find a male she can mate with. When a male and female frog mate, it is called *reproduction*.
- Using a total participation technique, invite responses from the group:
“What did you learn about reproduction when you studied life cycles?” (All organisms reproduce, and reproduction results in an offspring and starts a new offspring.)
- Tell students that they are going to play a game to replicate the frog calls that frogs make.
- Have half of the students move to one side of the classroom and the other half move to the other side of the classroom.
- Pass out one set of **frog call shakers** to all students on one side of the room and explain that the shakers have been filled with different materials to imitate the different sounds that various frog species make. Tell the students on this side of the room that they will shake their shaker when the game begins in order to model a male frog call ⁽¹⁾.
- Pass out the matching set of frog call shakers to all the students on the other side of the room and explain that these frogs are the female frogs. They will not shake their shaker during the game. Instead, they will shake their shaker before the game begins, listening closely to the type of sound that it makes. Once the game begins, they will have to find the “male frog” whose shaker makes the same sound as their own. They may shake their shaker quietly to themselves after the game has started to review what sound they are looking for, if needed.
- Answer any clarifying questions. Begin the activity:
 - Invite students who are modeling female frogs to listen to the sound of their own shaker.
 - Ask the “female frogs” to stop shaking their shakers, and remind them that their job is to now find the “male frog” whose shaker makes the same sound.
 - Tell the “male frogs” to begin shaking their shakers.
 - Allow the “female frogs” to walk around to the different “male frogs” until they have identified the “male frog” with the shaker that makes the same sound as their own.
 - Once they think they have found the other student who matches their sound, both students should come up and check with the teacher.
 - Once students have found the student with the matching frog call shaker, have them sit down.
 - Continue the game until all students have found their match.
- Distribute one of the **Frog Parent cards** to each pair. (Repeating pictures are fine.) Ask students to take a minute to look at and discuss the things they notice and wonder about the picture with their partner.
- Invite each pair to move to sit with another pair or two to create groups of four or six students.
- Ask students to look at the other pictures of frog parents that are now in their group.
- Invite groups to discuss:
“What do you notice about the appearance and traits of your picture of frog parents compared to the frog parents in your group?” (Each pair of frog parents looks different; they are different types of frogs.)

- Explain that only frogs of the same species can *mate* in order to *reproduce* and that for reproduction to occur, there must be two parents—a male and a female.
- Collect the Frog Parent cards to be used again in Section 2.

Preparing to Teach: Self-Coaching Guide

1. How will I ensure that all students have a partner to find?

Section 1: Obtaining Information

A. Reading about Inheritance (30 minutes)

- Distribute **“Why Do I Look Like This?”** to each student ⁽¹⁾.
- Tell students that they will work hard as readers today to learn about why organisms look the way they do. Remind students that when they read complex texts, they often need to read the text multiple times. Tell them it’s okay if they do not understand everything the text says the first time through.
- Remind students of some of the close reading practices they follow in their Language Arts lessons:
 - Read small chunks of the text slowly and think about the gist.
 - Talk with my partner or group about the text.
 - Circle or underline words I don’t know.
 - Write notes or answer questions about the text.
- Refer students to the “Obtaining Information” section in the Inheritance of Traits entry in their student science notebook. Ask them to put their finger on the Inheritance graphic organizer.
- Tell students they will have the opportunity to independently read the text. Tell them to stop after each paragraph during this first read and jot the gist of that paragraph and any unfamiliar vocabulary in their notebook. Review and model finding the gist as necessary.
- Ask students to begin reading. Circulate and support students as they read and determine the gist ⁽²⁾.
- After 10 minutes, ask students to turn to and talk to an elbow partner:

“What gist notes or vocabulary words did you write down? What similarities and differences are there between our notes?” (Inheritance. Like animals, plants inherit traits from their parent plant.)
- After 5 minutes, refocus whole class. Point out to students that their job is to learn everything they can about why organisms look the way they do.
- Tell students they are going to read the text again. This time, they should read closely for details to add to the Inheritance graphic organizer in the “Obtaining Information” section of the Inheritance of Traits entry in their science notebook.
- Consider doing a brief guided practice, as necessary.
- Ask students to begin reading and taking notes. Circulate and support students as they read.
- Invite them to reread the text on their own, writing down key details in their science notebook.

- Circulate to monitor student reading and note taking.
- After 15 minutes, refocus whole group and direct students' attention to the posted **Inheritance anchor chart**.
- Using a total participation technique, invite responses from the group:
"What facts, definitions, and details did you record in your graphic organizer?" (Traits are inherited from both male and female parents.)
- As students share, capture their ideas on the Inheritance anchor chart.
- Using a total participation technique, invite responses from the group:
"What do you think inheritance means?" (the thing you get from your parents—in this case, the traits)

Preparing to Teach: Self-Coaching Guide

1. How can I be sensitive to my students who don't live with biological parents?
2. Which students may need additional support during this close read? How will I support them?

Section 2: Constructing an Explanation

A. Creating Frog Offspring after the Pattern of Inheritance (25 minutes)

- Tell students they will be constructing an explanation to answer the following question ⁽¹⁾:
 — "Why does an offspring look the way it does?"
- Tell students that before they can construct an explanation, they need to learn how to construct an explanation.
- Draw students' attention to the **Scientists Do These Things anchor chart** and select a volunteer to read the first step for constructing an explanation.
 — 1. Observe relationships
- Using a total participation technique, invite responses from the group:
"What relationships have you noticed in the traits of parents and offspring?" (Offspring have some traits from both their mother and father.)
"What images from the slideshow from Lesson Sequence 1 or the article you just read make you say that?" (Responses will vary.)
- Tell students these are good pieces of evidence but they are going to gather some more evidence that will strengthen their explanation. They are going to use the pattern of inheritance to predict possible frog offspring from a mother and father frog.
- Briefly model for students how to identify possible traits for an offspring:
 - Display the **model frog parents picture** and explain that it shows a male and a female frog.
 - Ask students to turn and talk with an elbow partner:
"What two traits do you notice about the frogs?" (One has small brown spots and a tan body, and the other has a greenish body and larger splotches.)

- Show students the **model Inheritance table** and explain your process, thinking aloud.
Say:

“First, I wrote down a few traits of one parent and a few traits of the other parent. In this case, the parent on the left is the female and the one on the right is male, but if you can’t tell which one is male and which one is female, you can just use Parent 1 and Parent 2.”

“Then, I used the chart to predict what the offspring may look like by combining traits from the mother and father frogs.”

- Answer clarifying questions.
- Invite students to open their student science notebook to the Inheritance of Traits entry and find the Inheritance table in the “Constructing an Explanation” section.
- Arrange students into pairs.
- Redistribute the Frog Parent cards.
- Explain to students that since they can’t actually identify which frog is male and which is female based on the picture, they can just assume the frog on the left is the male and the frog on the right is the female.
- Post directions on the board and read them with students. Answer clarifying questions:
 1. With your partner, use the Inheritance table to create a list of possible frog children based on the traits of the frogs pictured.
 2. Once you have completed Step 1, raise your hand.
 3. Once your list has been approved by the teacher, you will receive a **Frog Offspring Outline** and **colored pencils**. Wait to color your frog child until the teacher has modeled this process.
- When most groups are done, model briefly how to take the traits from the Inheritance table and use them to create a frog child by displaying the **model frog offspring**.
- Say something like: “Here is my frog child. I decided to make Offspring #1, so I colored it brown/green and added small black dots. I know from the reading that organisms inherit traits from both male and female parents. So, I took one trait from the male (the brown/green color) and one trait from the female (the small black dots). So, my offspring follows the correct inheritance pattern.”
- Invite students to work with their partners to color their frog child using the Frog Offspring Outline ⁽²⁾.
- As students work, remind them that they will be using the knowledge gained through this activity to construct an explanation for why they designed the frog offspring the way they did.

Preparing to Teach: Self-Coaching Guide

1. How can I have some of the images from the slideshow ready in case my students need to be reminded of the relationship?
2. After previewing this activity, which groups do I think may need additional support?

B. Back-to-Back and Face-to-Face: Constructing an Explanation: (20 minutes)

- Draw students' attention back to the Scientists Do These Things anchor chart and select a volunteer to read the second and third step for constructing an explanation.
 - 2. Collect evidence.
 - 3. Identify what evidence supports the observed relationship.
- Tell students they have been collecting evidence by reading a text, looking at pictures, and creating a frog offspring. Invite students to turn and talk to an elbow partner about the evidence that helps them explain about the pattern of inheritance.
- Tell students they are now ready to construct an explanation.
- Direct students to the Scientists Do These Things anchor chart and read the fourth step.
 - 4. Construct an explanation: Make a claim, describe evidence, and provide scientific reasoning.
- Remind students that their explanation should answer the question:

“Why does an offspring look the way it does?”
- Model how to construct an explanation. Say something like: “All offspring look like their parents. I know this because I saw the pattern before in the slideshow. My evidence is that I saw that human, dog, and cow offspring all look similar to and different from their parents. I also have evidence from the article I read, which said that all animals look similar to and different from their parents. My other evidence is the chart and the frog I made. The frog has brown spots like its mother and a green body like its father. This evidence shows that a frog offspring inherits traits from two parents and so it will look similar to each parent but a little different. My frog follows this pattern, and this pattern is true for all offspring.”
- Invite students to take out their Frog Offspring Outline.
- Tell them they are going to practice constructing an explanation using the Back-to-Back and Face-to-Face protocol ⁽¹⁾.
- Have students find a partner and stand back-to-back with each other, being respectful of space.
- Ask students the following question and give them 30 seconds to consider how they will respond:

“Why does an offspring look the way it does? How does the pattern of inheritance help you answer this question?”
- Invite students to turn face-to-face to share their responses.
- Have students repeat protocol with a new partner for other questions or statements ⁽²⁾.

“What is your evidence from the reading?”

“What is your evidence from the frog you created?”

“How does your frog follow the pattern of inheritance?”
- Ask students to return to their seats and open their science notebooks to the Inheritance of Traits entry and find the sentence stems under the Inheritance table.
- Give students 10–15 minutes to write their explanation. (If there isn't enough room in the notebook, have students write it on a separate piece of paper and staple it in their notebook.)

Preparing to Teach: Self-Coaching Guide

1. How familiar are my students with the Back-to-Back and Face-to-Face protocol?
2. This protocol provides students time to practice their explanation before they write it down. Based on my observations, what students are still struggling to articulate an explanation?

Section 3: Evaluating and Communicating Information

A. Scientists Meeting: Building Understanding (30 minutes)

- Ask students to bring their science notebooks and gather for a Scientists Meeting ⁽¹⁾.
- Direct students' attention to the **Norms of a Scientists Meeting anchor chart**. Using a total participation technique, invite responses from the group:
"What are the norms of a Scientists Meeting?" (take turns talking, build on one another's ideas, disagree respectfully, ask questions to clarify information)"
- Remind students that a Scientists Meeting is a conversation where they speak to one another as scientists and not just to the teacher.
- Tell students the goal of this meeting is to build understanding about how traits are inherited from parents.
- Invite students to open their science notebooks to the Inheritance of Traits entry and find the "Constructing Explanations" section.
- Direct students' attention to the posted **Unit 1 guiding question** and select a volunteer to read it aloud:
 - "Why does an organism look the way it does, and why does it matter?"
- Using a total participation technique, invite responses from the group ⁽²⁾:
"What information has the class collected to help us answer the guiding question?" (Offspring inherit traits from both their mother and father. All organisms are offspring, so all organisms inherit traits from their parents.)"
- Encourage students to listen to and respond to one another's ideas. Consider using or prompting students to use the following:
"Can someone paraphrase what Student A said?"
"Who thinks something similar to Student A?"
"Who thinks something different from Student A?"
"Can you add to what Student A said?"
- Draw students' attention to the Scientists Do These Things anchor chart and select a volunteer to read the steps for Constructing an Explanation. As each step is read, pause and ask students to share what they have done in class for that step.
 - Observe relationships (pattern that family members look similar yet different)
 - Collect evidence (read "Why Do I Look Like This?" and looked at pictures)
 - Identify what evidence supports the observed relationship (Inheritance table)
 - Construct an explanation (explanation for why offspring look the way they do)

- Invite students to share the frog offspring they created and explain why they look the way they do. Remind students to include evidence and reasoning.
- Ensure that students who had the same Frog Parent cards both share out. Then ask:
“These frogs are siblings—that is, they have the same parent frogs. Do they look exactly the same? How does this follow a pattern we studied in this unit?” (Siblings look similar but not exactly the same. Refer students to the Inheritance anchor chart as necessary.)
“Why don’t they look the same? (They inherited some traits from their mom and some from their dad.)
- If conflicting information arises, help students challenge one another’s ideas respectfully:
“Why do you think you have different conclusions from Student A’s?”
“With what in Student A’s argument do you disagree? On what points do you agree? What evidence do you have to support those ideas?”
- Return to the Scientists Do These Things anchor chart and offer students specific positive praise on their good work constructing explanations.
- Under the definition of “Constructing Explanations” on the Scientists Do These Things anchor chart, add the example of “Predicting Frog Offspring Possible Inheritance—offspring inherit traits from parents.”
- Draw students’ attention to the Concepts Scientists Think About anchor chart and ask:
“What pattern have we learned about what occurs between parents and offspring?” (All offspring inherit traits from their parents.)
- As students share out, add this example to the Concepts Scientists Think About anchor chart.

Preparing to Teach: Self-Coaching Guide

1. How well are my students keeping the norms of the Scientists Meeting?
2. Which students will I intentionally invite into the conversation?

B. Returning to Life Cycle Diagram (15 minutes)

- Give students specific positive praise on the great job they have done working as scientists. (Example: “I noticed that X and Y frequently returned to their Inheritance table and student science notebooks when drawing their frog child.”)
- Remind students that as scientists learn more, they return to models and explanations to revise and add their new learning.
- Using a total participation technique, invite responses from the group:
“What have we recently learned about reproduction?” (Reproduction is a stage in the life cycle. It involves two mates—one female and one male—and results in offspring with inherited traits.)
- Invite students to open their student science notebook to the **Life Cycle entry** and find the General Pattern of Life Cycle model ⁽³⁾.
- Tell students that they should add their new learning about reproduction involving two parents and resulting in an offspring with inherited traits to their model. Because this is generally true for all organisms, they should add it to the General Life Cycle model and write it off of the box labeled “reproduction.”

- Invite students to turn and talk:

“Using your General Life Cycle model, what prediction can you make about what would happen to the species if an organism could not find any mates?” (The species would be unable to survive because it could not reproduce if mates were not available.)

- Tell students that in the next lesson sequence, they will continue to think about what helps a species be able to survive, find mates, and reproduce.

Preparing to Teach: Self-Coaching Guide

1. How can I help my students quickly and efficiently transition to revising the life cycle diagram?

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.