

Grade 3: Life Science Module

Student Science Notebook

Student Science Notebook

The student science notebook begins on the next page and continues for the next 49 pages. The notebook is meant to be printed on the back and front of pages. Be sure to print it so that when the notebook is opened, the directions are on the left hand side of the page and the space for the student writing is on the right hand side. See the image below.


Inheritance, Variation, and Frog Ponds	Grade 3: Life Science Module: Student Science Notebook						
<p style="text-align: center;">Anchoring Phenomenon for Inherited Traits Entry Directions</p> <p>Opening</p> <p> <u>Learning Target:</u></p> <ul style="list-style-type: none"> I can ask questions based on observations to find out more about why organisms vary in how they look. <p>Obtaining Information</p> <p><u>Diversity of Organisms</u></p> <ul style="list-style-type: none"> Record your general observations from the video, the book, the photos, and the activities. <p style="text-align: right;">392</p>	<p style="text-align: center;">Anchoring Phenomenon for Inherited Traits Entry</p> <p>Obtaining Information</p> <p><u>Diversity of Organisms</u></p> <table border="1" data-bbox="913 767 1382 1336"> <tbody> <tr> <td data-bbox="913 767 1037 957">Variation among different species</td> <td data-bbox="1037 767 1382 957"></td> </tr> <tr> <td data-bbox="913 957 1037 1146">Variation within a species</td> <td data-bbox="1037 957 1382 1146"></td> </tr> <tr> <td data-bbox="913 1146 1037 1336">Variation within a family</td> <td data-bbox="1037 1146 1382 1336"></td> </tr> </tbody> </table> <p style="text-align: right;">EL Education Curriculum 393</p>	Variation among different species		Variation within a species		Variation within a family	
Variation among different species							
Variation within a species							
Variation within a family							

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Anchoring Phenomenon for Inherited Traits Entry Directions

Opening



Learning Target:

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

Obtaining Information

Diversity of Organisms

- Record your general observations from the video, the book, the photos, and the activities.

Anchoring Phenomenon for Inherited Traits Entry

Obtaining Information

Diversity of Organisms

Variation among different species	
Variation within a species	
Variation within a family	

Anchoring Phenomenon for Inherited Traits Entry

Scientists Meeting: Gathering Ideas

- Record your ideas and takeaways about the guiding question from today's Scientists Meeting.

Anchoring Phenomenon for Inherited Traits Entry



Unit 1 Guiding Question

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

Gathering Ideas

Variation among Siblings Entry Directions

Opening

Focusing Question:

- What patterns of variation are there among siblings?



Learning Target:

- I can observe and analyze patterns of variation among siblings.

Analyzing and Interpreting Data

Identifying Patterns in Animals Chart

- What similarities do you see in the members of the family? What traits do the siblings share?
- What differences do you see in the members of the family? What traits are different?
- What patterns do you notice between human siblings and other animal siblings?

Variation among Siblings Entry

Opening:

Write or draw something to capture your ideas about the learning target or the focusing question.

Analyzing and Interpreting Data

Identifying Patterns in Animals Chart

Picture #	Similarities	Differences

Patterns noticed between human siblings and other animal siblings:

Variation among Siblings Entry Directions

Identifying Patterns in Plants

- Look closely at the picture of the water lilies.

Constructing Explanations

- What have you noticed about variation among siblings that helps you begin to answer the question "Why does an organism look the way it does, and why does it matter?"
- Record your ideas and highlights from the Scientists Meeting.

Variation among Siblings Entry

Identifying Patterns in Plants

Plant Data Table

Trait	Flower color	# of petals	Petal shape	Height in water	Size of flower
Plant 1					
Plant 2					
Plant 3					

Constructing Explanations

Life Cycle Entry Directions

Opening

Focusing Question:

- What patterns are there in different organisms' life cycles?



Learning Target:

- I can model the life cycle of a plant and animal.
-

Bullfrog Life Cycle Model

- With simple drawings, arrows, and labels, show the life cycle of a bullfrog.

Life Cycle Entry

Opening:

Write or draw something to capture your ideas about the learning target or the focusing question.

Bullfrog Life Cycle Model

Life Cycle Entry

Animal Life Cycle Graphic Organizer

My animal: _____

Name of the life cycle stage	What happens at that stage?
ex. Froglet	<i>grows legs, grows lungs, and loses its gills and crawls onto land</i>

Life Cycle Entry



Learning Targets #2

- I can compare and contrast the diverse life cycles of plants and animals to identify a pattern of life.
- I can use a model to make predictions.



Learning Targets #2:

- Write or draw something to capture your ideas about the learning target or the focusing question.

Life Cycle Entry

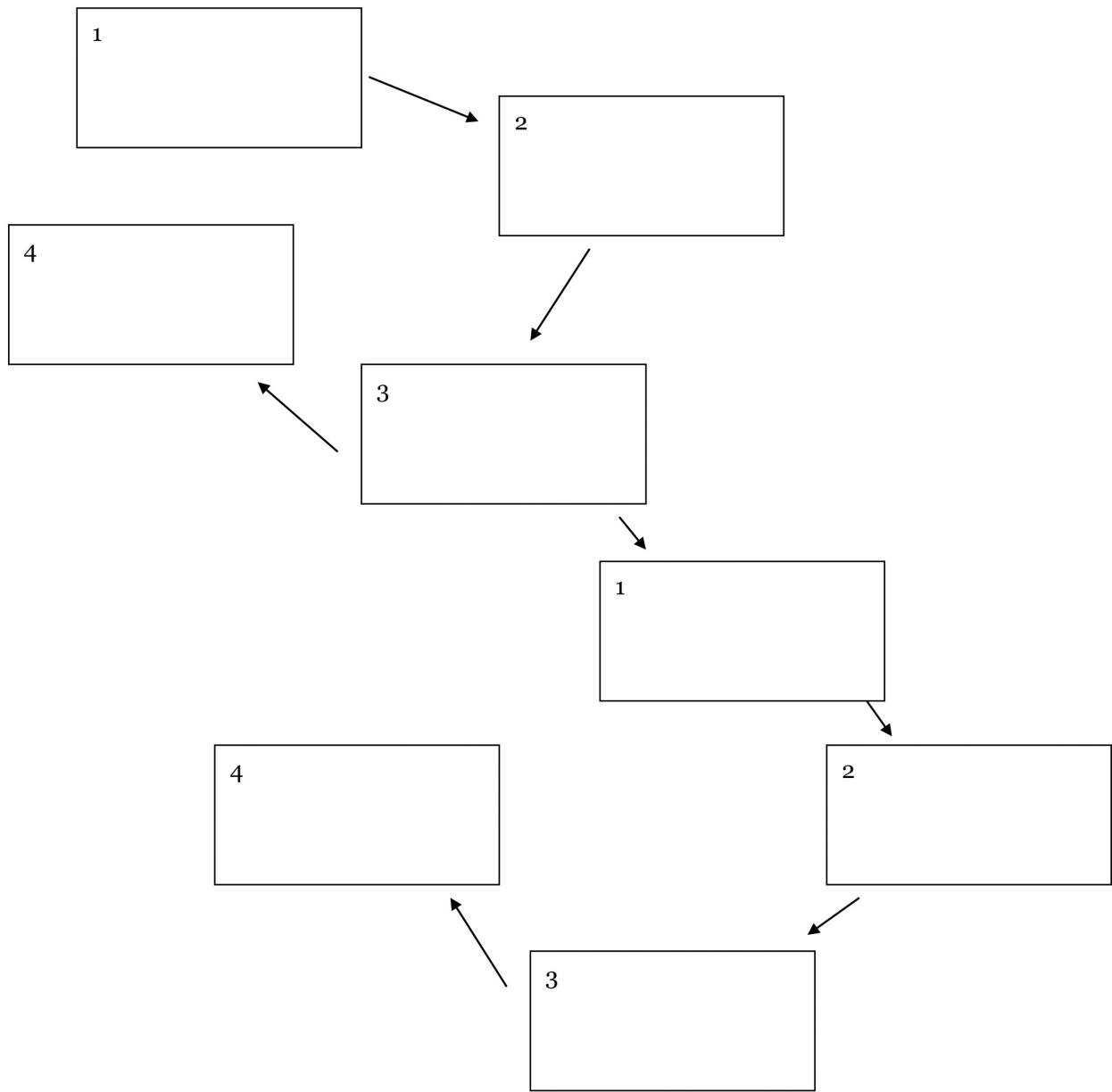
Patterns of Life Cycles Chart

- As you walk around in the Poster Session today, take note of the similarities and differences in the life cycle.

Differences in life cycles	Similarities among life cycles (patterns)

Life Cycle Entry

General Pattern of Life Cycle



Inheritance of Traits Entry Directions

Opening

Focusing Question:

- What patterns in appearance exist between offspring and their parents?



Learning Target:

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

Obtaining Information

Inheritance Graphic Organizer

First Reading:

- Pause after reading each paragraph and write down the gist and any new vocabulary words.

Second Reading:

- Pause after reading each paragraph and write down facts, definitions, and details.

Inheritance of Traits Entry

Opening:

Write or draw something to capture your ideas about the learning target or the focusing question.

Obtaining Information

Inheritance Graphic Organizer

	1. Gist and Vocabulary	Facts, Definitions, and Details
Humans		
Other Animals		
Plants		

Inheritance of Traits Entry Directions

Constructing an Explanation

Frog Offspring Possible Inheritance

1. Observe relationships

Remember what you've noticed about the patterns between parent and offspring traits.

2. Collect evidence

Read the article.

Record the traits of the mother and father frog.

3. Identify what evidence supports the observed relationship.

What evidence is there to support how you drew your frog offspring?

4. Construct explanation

Make a claim to answer the question. Describe your evidence. Provide scientific reasoning.

Inheritance of Traits Entry

Constructing an Explanation

Inheritance Table

Traits of Mother	Traits of Offspring	Traits of Father
	#1	
	#2	
	#3	

Explanation Claim:

An offspring looks the way it does because: _____

My evidence is:

(Scientific reasoning) This shows that ...

Variation and Survival Entry Directions

Opening

Focusing Question:

- What is the cause and effect relationship between variation of traits and how well an organism survives?



Learning Target:

- I can support an explanation about how the variation of traits in organisms might provide an advantage in surviving, finding mates, and reproducing.

Constructing Explanations

1. Observe relationships

What is the relationship between how a frog looks (its traits) and how well it survives?

2. Collect evidence

Look at the pictures of various bullfrogs to collect data about how the bullfrog matches its environment.

Variation and Survival Entry

Opening:

Write or draw something to capture your ideas about the learning target or the focusing question.

Constructing Explanations

Photo	Bullfrog: Traits of Bullfrog	Characteristics of Environment	How does it match or not match?
1			
2			
3			
4			
5			

Variation and Survival Entry

Constructing Explanations (*continued*)

3. Identify what evidence supports the observed relationship.

Look at Column 3.

4. Construct explanation:

What is the relationship between how a frog looks (its traits) and how well it survives?

Write your explanation and give examples from evidence that was collected.

Variation and Survival Entry

Constructing Explanations (*continued*)

Explanation:

Claim:

Evidence:

Reasoning:

Variation and Survival Entry Directions

Water Lily: Pollination Preference of Beetles Model

Read the article and record notes on what flower traits beetles prefer to pollinate.

Variation and Survival Entry

Water Lily: Pollination Preference of Beetles Model

Draw and label the type of flowers that beetles prefer to pollinate:

Traits and Survival Entry Directions

Opening

Focusing Question:

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



Learning Targets:

- I can explain why an organism looks the way it does and why it matters.
- I can create a frog following the patterns of inheritance and variation of traits.
- I can create high-quality work.

Traits and Survival Entry

Opening:

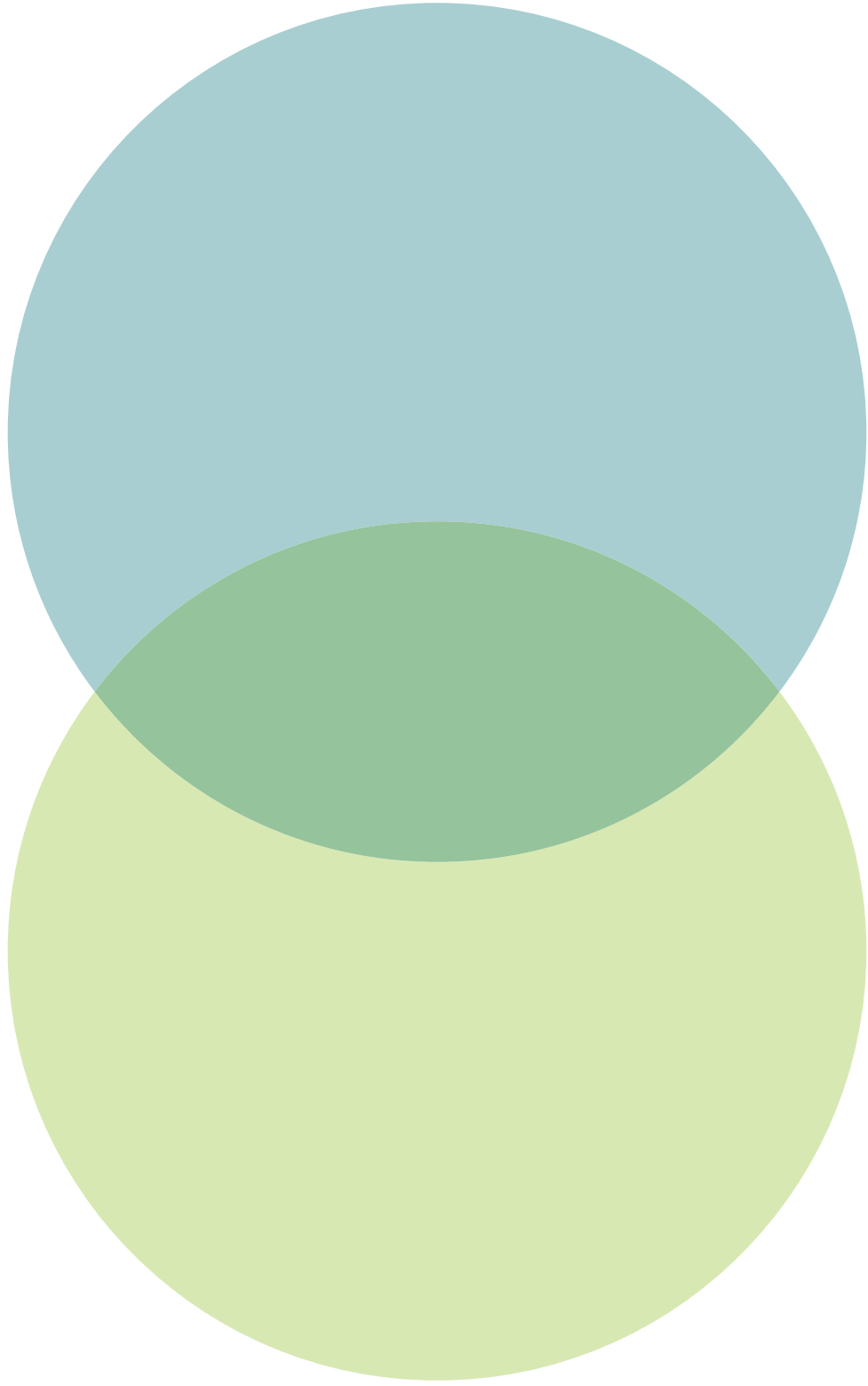
Write or draw something to capture your ideas about the learning target or the focusing question.

Bullfrog Offspring Data Table

Traits of Mother	Traits of Offspring	Traits of Father
	#1	
	#2	
	#3	

Traits and Survival Entry

Sibling Venn Diagram



Traits and Survival Entry

Bullfrogs and Survival in the Lily Pads

Observation

How well is my bullfrog camouflaged?

Predictions

Which bullfrog do you think would be most likely not to survive?

Why?

Which bullfrog would be most likely to survive?

Why?

Frog Pond Anchoring Phenomenon Entry Directions

Opening

Focusing Question:

- What are necessary parts of a frog habitat?
- How do those parts interact to support the survival of frogs throughout their life cycle?
- How can we build that?



Learning Targets:

- I can reflect on the issue of frog habitat loss.
- I can generate ideas about what I'll need to know in order to design a frog habitat.

Write down observations of structures in frog habitats.

Naming the Problem

Respond to the prompt:

Write three to five sentences about how habitat loss affects frogs and why this is a problem.

Naming the Solution

(Tape a Pond Success Story Photo Card here).

Frog Pond Anchoring Phenomenon Entry

My observations of a frog habitat are ...

Naming the Problem:

Habitat loss is a problem because ...

The evidence for this is ...

Naming the Solution

Jot down your ideas about the solution here.

Environment and an Organism's Traits

Entry Directions

Opening

Focusing Question:

- How does an environment affect an organism's traits?



Learning Targets:

- I can play the Hungry Bullfrog game to explain the cause and effect relationship between a frog obtaining enough food and its ability to survive well in an environment.
- I can develop an experiment to test the cause and effect relationship between plant traits and the environment it's in.

Using Models

Hungry Bullfrog Simulation

Overview:

The sack represents the frog.

The tokens represent the food.

Setup:

1. Place Hungry Bullfrog cards and tokens in the middle of the table.
2. Place 10 tokens in every sock before beginning.

Directions:

1. Draw a card and read it out loud.
2. Follow the directions on the card to either collect tokens from the bowl or return tokens to the bowl.
3. Record the cause and effect relationship described on the card in the "Using Models" section on the chart provided.
4. After recording the relationship, discard the card into a separate pile.
5. Next player repeats Steps 1–4.
6. Continue taking turns until the time is up.

Write or draw something to capture your ideas about the learning target or the focusing question.

--

Record the cause and effect relationship in the cards you draw below.

Effect: Gained weight	Effect: Lost weight
What in the environment caused this?	What in the environment caused this?

Starving—not surviving well. Might starve before reproduction! (less than 5 grams)

Environment and an Organism's Traits

Entry Directions

Constructing an Argument

Preparing for the argument:

1. Pose the question.
2. Identify evidence that answers the question.
3. Evaluate whether that evidence is good enough.

Making the argument:

1. Make a claim.

I'm arguing that ...

2. Use the evidence and scientific reasoning to support the claim.

The evidence I have is ...

This evidence shows ...

3. Explain why the evidence is good evidence.

This is good evidence because ...

This image shows a blank sheet 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.

Environment and an Organism's Traits

Entry Directions

Planning an Investigation

Steps:

1. Ask an investigation question.
2. Choose only one variable.
3. Determine the materials needed to test the variable.
4. Set up an experiment ... Be sure to keep everything the same except the variable.
 - A. Label each cup: Control, Test 1, and Test 2
 - B. Pour distilled water halfway up the cup so that each cup has an equal amount.
 - C. Put three duckweed plants in each cup.
5. Record the initial data.

Duckweed and Habitat Data Table

	Control		Test Cup 1		Test Cup 2	
	Date:	Date:	Date:	Date:	Date:	Date:
Color of leaves						
Amount of plants						
Size of leaves						

"Grow well" means ...

Circle which cup in which the duckweed grew well:

control variable inconclusive

Environment and an Organism's Traits Entry

Planning an Investigation

Different characteristics of a pond that may influence how duckweed grows:

Designing Our Experiment

This is our investigation question: "Under what conditions in a pond does duckweed grow well?"

What is the one thing we'll change? (Variable): _____

What will we keep the same in all the cups?

What do we think will happen? We predict _____
because ...

What will we need to measure? How will we measure it?

What materials will we need?

Duckweed

Cups

Water

The Pond Is a System Entry Directions

Opening

Focusing Question:

- How does a pond act as a system to support all parts of a frog's life cycle?



Learning Target:

- I can create a cross-section diagram (or model) that explains how the different parts of a pond meet the needs of the frogs that live there.

Obtaining Information

Pond Article

1. Complete a first, independent read of the text. Record the gist of each paragraph in the margins of the text. Circle unfamiliar vocabulary.
2. Turn and talk with a partner who has also completed a first read to discuss the gist you captured and the vocabulary you circled.
3. Complete a second, independent read of the text, focusing on the spaces in the pond. Record your findings in the first column of the Pond Article note-catcher.
4. Using your notes from the "Life Cycle" section of your student science notebook, complete the second column of the note-catcher.
5. Complete a third, independent read of the text, focusing on how each part of the pond provides food, water, shelter/space. Record your findings in the third column of the note-catcher.

The Pond Is a System Entry

Opening:

Write or draw something to capture your ideas about the learning target or the focusing question.

Obtaining Information

Pond Article note-catcher

Second read: Spaces in the pond	Needs during the stages of the life cycle	Third read: What food, water, shelter/space is available for a frog?
	egg:	
	tadpole:	
	froglet:	
	adult:	

The Pond Is a System Entry Directions

Communicating Information

Create your frog pond cross-section diagram in this space.

- Include labels that name and explain the parts.
- Return to your model and add more as you learn more.

Evaluating Information

Scientists Meeting: Building Understanding

Record any notes or thoughts from your discussion.

The Pond Is a System Entry

Communicating Information

Frog Pond Cross-Section Diagram (model)

Evaluating Information

Scientists Meeting: Building Understanding

Habitat Entry Directions

Opening

Focusing Question:

- What is the cause and effect relationship between an organism and its habitat?



Learning Target:

- I can explain the effect that the habitat has on how well an organism survives.

Engaging in Argument: Duckweed and Habitat

Preparing for the argument:

1. Pose the question.
2. Identify evidence that answers the question.
3. Evaluate whether that evidence is good enough.

Making the argument:

1. Make a claim.

Sentence stem: *I'm arguing that ...*

2. Use the evidence and scientific reasoning to support the claim.

Sentence stem: *The evidence I have is ... This evidence shows ...*

3. Evaluate if the evidence is good evidence.

Sentence stem: *This is good evidence because ...*

Habitat Entry

Focusing Question and Ideas:

Engaging in Argument: Duckweed and Habitat

Question:

Under what conditions in a pond does duckweed grow well?

Claim: *(I'm arguing that ...)*

Evidence #1 with scientific reasoning

Evidence #2 with scientific reasoning

Evaluation of evidence: *(This is good evidence because ...)*

Habitat Entry Directions

Habitat Note-catcher

Habitat Station: Food

Questions to think about:

What kind of food do frogs need at each stage of their life cycle?

How can we make sure that these foods are present?

Other questions I have:

Habitat Station: Water

Questions to think about:

Why do frogs need water?

What needs to be in the water to help the frog survive?

Other questions I have:

Habitat Station: Shelter/Space

Questions to think about:

What kind of shelter (leaves, logs, rocks, plants) do frogs need at each stage of their life cycle?

Other questions I have:

Habitat Entry

Habitat Note-catcher

	Egg	Tadpole	Froglet	Adult Frog
Habitat Station: Food				
Habitat Station: Water				
Habitat Station: Shelter/Space				

Designing a Frog Pond Entry Directions

Opening

Guiding Question:

- What are the necessary parts of an amphibian habitat, and how can we build that?



Learning Targets:

- I can design a frog pond that functions as a system and meets all the needs of the organisms that live there.
- I can construct and support an argument with evidence about how well my designed frog pond meets the needs of the frogs that will live in it.

Engineering Design Cycle:

A. Challenge

Jot down notes or questions you had about the challenge.

B. Imagine

What design structures do you possibly want to include?

C. Plan

Draw a rough-draft sketch here of your pond diagram.

D. Create

Use graph paper to create your diagram.

E. Improve

Record suggestions from your peer reviewer.

F. Communicate

What are you going to highlight to share about your diagram?

Designing a Frog Pond Entry

Engineering Design Cycle:

A. Challenge

B. Imagine

C. Plan

Designing a Frog Pond Entry

Engineering Design Cycle:

A. Challenge

Jot down notes or questions you had about the challenge.

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Designing a Frog Pond Entry

Engineering Design Cycle:

D. Create

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F. Communicate

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