

Grade 5: Life Science Module

Lesson Sequence 5: Parts of an Ecosystem

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Overview

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

In this lesson sequence, students learn the basic components and interactions in an ecosystem by becoming experts on one of three forest ecosystems: temperate, boreal, or tropical. They learn about the abiotic (nonliving) and biotic (living) things in their forest ecosystem in order to begin the poster-size explanatory model of a specific ecosystem. They also create ecosystems in a baggie as a physical replica of an ecosystem.



Lesson Sequence Focusing Question and Big idea

How do the parts of a forest ecosystem interact?

- An ecosystem is made up of abiotic (nonliving) and biotic (living) things.
- Examples of abiotic parts include water, soil, temperature, and sunlight.
- Biotic parts include the plants and animals.
- The abiotic and biotic parts must both be present and interacting in order for the ecosystem to function.

Long-Term Learning Addressed (Based on NGSS)

Develop a model to explain that an ecosystem is made of biotic (living) and abiotic (nonliving) features that interact with one another. (Based on NGSS 5-LS2-1)

This lesson sequence explicitly addresses:

Science and Engineering Practices:

- **Developing and Using Models:** Develop a model to describe phenomena. *Students develop an explanatory model of a forest ecosystem and create a physical replica of an ecosystem through their ecosystem in a baggie.*

Crosscutting Concepts:

- **Systems and System Models:** A system can be described in terms of its components and their interactions. *Students learn about how the abiotic and biotic factors of an ecosystem interact in a balanced way to create a healthy ecosystem.*

Disciplinary Core Ideas:

- **LS2.A: Interdependent Relationships in Ecosystems:** A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. *Students learn about specific organisms that live in one of the three forest ecosystems under study. They begin to build their understanding of how these organisms interact in order to create a stable web of life.*



Lesson Sequence Learning Targets

- I can name the abiotic and biotic parts of a particular forest ecosystem.
- I can develop a model that shows how the biotic and abiotic parts of a forest ecosystem interact.

Ongoing Assessment

- Scientists Meeting: Building Understanding
- Student science notebook: Parts of an Ecosystem entry
- Expert ecosystem explanatory model

Agenda

Total Time: 2.5 hours of instruction

Section 1

1. Opening

A. Introducing Learning Targets and Focusing Question (10 minutes)

2. Obtaining Information

A. Viewing “Forests” (10 minutes)

3. Developing a Model

A. Creating an Ecosystem in a Baggie (30 minutes)

Section 2

1. Evaluating Information

A. Scientists Meeting: Building Understanding (20 minutes)

Optional Extension: Outdoor Observation of Schoolyard Ecosystem

2. Obtaining Information

A. Collecting Information for Expert Ecosystems (30 minutes)

Optional Extension: Study Role of Bugs in Ecosystem

Section 3

1. Developing a Model

A. Developing an Expert Ecosystem Explanatory Model (30 minutes)

2. Evaluating Information

A. Scientists Meeting: Building Understanding (20 minutes)

Teaching Notes

Purpose of lesson sequence and alignment to NGSS standards:

- This lesson sequence is the first in a series aligned to LS2.A: Interdependent Relationships in Ecosystems. In this lesson sequence, students build background knowledge of the organisms present in a forest ecosystem to begin to see how a healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life (a Disciplinary Core Idea).
- In Section 1, students learn how an ecosystem is a collection of abiotic and biotic features working together as a system (a Crosscutting Concept). They also create their own ecosystem in a baggie so they can informally observe these interactions over the course of the module.
- In Section 2, students become experts in one of three forest ecosystems: temperate, boreal, or tropical.

- In Section 3, students begin working on their model—an expert ecosystem explanatory model (a Science and Engineering Practice). As they obtain more information throughout the remainder of the module, they will continually return to this model to revise it.

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

- In this lesson sequence, students continue to determine the criteria for a healthy ecosystem. This lesson sequence focuses on the interaction of abiotic and biotic factors and the interdependence of organisms and what they look like in a healthy ecosystem.

How it connects to the CCSS Standards and EL Education’s Language Arts Grade 5

Module 2:

- Students learn about a tropical rainforest in Language Arts Grade 5 Module 2. Consider placing students who may need additional support in understanding content and reading in the Tropical Forest Ecosystem expert group because they will bring background knowledge from their Language Arts class.
- The reading in Section 2 provides students the opportunity to practice reading informational texts and explaining the relationship between two or more ideas (CCSS ELA RI.5.3).
- The Scientists Meetings in Section 2 and Section 3 provide students the opportunity to practice their speaking and listening skills while collaborating in whole group discussions (CCSS ELA SL.5.1).
- Students may be familiar with the Think-Pair-Share protocol from Language Arts Grade 5 Module 2. This protocol provides students the opportunity to practice speaking and listening skills (CCSS ELA SL.5.1).

Possible student misconceptions:

- Students may confuse the words biome and ecosystem. A biome is a specific geographic area whereas an ecosystem is the interaction of living and nonliving things in an environment. A biome can be made up of many ecosystems, but an ecosystem cannot be made up of a biome. Explain that the video “Biome in a Baggie” misuses this word; really they are creating an ecosystem in a baggie.

Possible broader connections:

- Connect to students’ lives by discussing the abiotic and biotic features of local ecosystems.
- If your school is located in an urban setting and does not have any “green spaces,” consider using a nearby park or even garden beds that students may be familiar with as the model example for the schoolyard explanatory model.

Areas where students may need additional support:

- Students may need additional support in designing their ecosystems in a baggie.
- For students who need support with auditory processing or ELLs: Consider providing running notes or an outline of the video.
- Students will read text on the computer in this lesson sequence. Some students may benefit from additional support. Consider these options:
 - For students who may need additional support with paraphrasing or skimming the text: Consider providing running notes or an outline of today’s text.

- For students who may need additional support staying on pace during the reading time: Consider gathering these students in one place in the room to support them quickly and quietly throughout the reading portion of the lesson. Give prompts to help students stay on task, point out where the class is, or offer sentence frames as needed.
- For ELLs and students who may need additional support with reading and/or writing: Strategically pair students with a peer model.

Down the road:

- Continue to provide time for students to make informal observations of the ecosystems in a baggie until Lesson Sequence 8, when students formally revisit their ecosystems in a baggie. Creating a regular schedule for observation of the ecosystems will help integrate use of live plants into your classroom.
- Students will return to the expert ecosystem explanatory models created in this lesson sequence in Lesson Sequences 6–8. Post (or store) them in a safe and easily accessible location.
- Students will create their own models as part of the performance task in Lesson Sequence 11. Use the expert ecosystem explanatory models to guide your instruction as you prepare students to be successful on the performance task.

In advance:

- Read each section and complete the Preparing to Teach: Self-Coaching Guide.
- Gather materials necessary for students to create an ecosystem in a baggie (see Materials).
- Decide where in the classroom the completed ecosystem in a baggie will be placed. Consider where the plants can get enough sunlight and the right temperature to germinate and grow.
- Pre-determine:
 - Pairs of students to create an ecosystem in a baggie together in Section 1.
 - Groups of three or four students to serve as ecosystem expert groups. Students will remain in these expert groups for the remainder of the module. There are three different forest ecosystems that are studied (temperate, boreal, and tropical). It is fine multiple groups study the same ecosystem.
- Decide whether to assign roles within the expert ecosystems groups or to give students the ability to choose their own roles: climatologist (climate), pedologist (soil), zoologist (animals), and biologist (plants). If there is a group of three, then all students will take on the role of zoologist, in addition to their other role.
- Prepare computers necessary for each student to view “Types of forest” under the Forest fact file <<http://www.arkive.org/habitats/forests/image-H401>>. If not enough computers are available, students may view this website in pairs or even share one computer between the whole ecosystem expert group.
- Prepare technology necessary:
 - For students to view “Types of forest” under the Forest fact file <<http://www.arkive.org/habitats/forests/image-H401>>. Consider whether students will view this individually, in pairs, or with their ecosystem expert group.
 - To play “Forests” <<https://www.pbslearningmedia.org/resource/c08430d6-c325-4274-9e9e-f49750debcd4/forests-science-trek/>>.
 - To play “Biome in a Baggie” <<http://www.pbslearningmedia.org/resource/tdc02.sci.life.stru.baggiezoom/biome-in-a-baggie/>>.

The Cycle of Matter and Energy in Healthy Ecosystems

- Review the Think-Pair-Share protocol (see the Classroom Protocols pack on Curriculum.ELeducation.org).
- Post: Lesson sequence learning targets, lesson sequence focusing question, Life Science Module guiding question, Scientists Do These Things anchor chart, Concepts Scientists Think About anchor chart, and Criteria for Healthy Ecosystems anchor chart.

Optional extensions:

- *Outdoor Observation of Schoolyard Ecosystem:* Have students take their student science notebooks outside to make observations of abiotic and biotic features of their schoolyard.
- *Study Role of Bugs in Ecosystem:* Have students read about the role of bugs <<https://www.nwf.org/Kids/Ranger-Rick/Animals/Insects-and-Arthropods/What-Good-Are-Bugs.aspx>> and think about the role that bugs play in their expert ecosystem.

Vocabulary

biotic: living things

abiotic: nonliving things

ecosystem: the living and nonliving things that make up an environment

biome: a specific geographic area

temperate: region with mild temperatures

boreal: region with cold temperatures

tropical: region with warmer temperatures and lots of moisture

Materials

General Materials

- ✓ Student science notebook (from Lesson Sequence 1; one per student)
 - Parts of an Ecosystem entry (page 20 of student science notebook)
 - Anchoring Phenomenon entry (from Lesson Sequence 1; page 2 of notebook)
- ✓ “Forests” (video; play in entirety; see Teaching Notes)
- ✓ Scientists Do These Things anchor chart (begun in Lesson Sequence 2; added to during Section 1; see supporting materials)
- ✓ “Biome in a Baggie” (video; play in entirety; see Teaching Notes)
- ✓ Schoolyard Ecosystem Poster-Size Explanatory Model (new; co-created with students during Section 2)
- ✓ Schoolyard Ecosystem Explanatory Model: Model for Lesson Sequence 5 (for teacher reference)
- ✓ Concepts Scientists Think About anchor chart (begun in Lesson Sequence 2; added to during Section 2; see supporting materials)
- ✓ Parts of a Forest Ecosystem (one per student)
- ✓ Criteria for Healthy Ecosystems anchor chart (begun in Lesson Sequence 1; added to during Section 3; see supporting materials)

Science-Specific Materials (gathered by the teacher)

- ☑ Materials for an ecosystem in a baggie (one set per pair; used in Section 1)
 - Bottom half of a 2-liter plastic bottle
 - Pebbles (a handful for each student)
 - Potting soil (approximately two cups per student)
 - Seed (grass or other type of seed; one teaspoon)
 - Resealable plastic bag (one)
 - Water (approximately 1/2 liter per student)
 - Masking tape (one roll)
 - Marker (one)
- ☑ Poster board (one piece per ecosystem expert group)

Section 1: Opening**A. Introducing Learning Targets and Focusing Question (10 minutes)**

- Begin the lesson by providing a transition from the previous lesson sequence. Say:

“Our goal is to be able to assess and give suggestions to improve the health of an ecosystem. To do that, we need to better understand the parts of the system and how they interact. So far, we have learned about how plants interact with different types of matter and sunlight. What other types of matter might be in a forest ecosystem? How might these types of matter interact?”
- Invite students to take out their **student science notebooks** and open to the **Parts of an Ecosystem** entry.
- Select a volunteer to read the focusing question listed under the “Opening” section aloud while the other students follow along, reading silently in their heads:
 - “How do the parts of a forest ecosystem interact?”
- Direct students’ attention to the posted lesson sequence learning targets. Read them aloud as students follow along, reading them silently in their heads:
 - *“I can name the abiotic and biotic parts of a particular forest ecosystem.”*
 - *“I can develop a model that shows how the biotic and abiotic parts of a forest ecosystem interact.”*
- Underline the words *biotic* and *abiotic* in both learning targets and define them (*biotic* refers to living things and *abiotic* refers to nonliving things).
- Using a total participation technique, invite responses from the group ⁽¹⁾:

“What nonliving (abiotic) things do you think might be in an ecosystem?” (soil, air, rocks, sunlight, temperature, and water)

“What living (biotic) things do you think might be in an ecosystem?” (plants and animals)
- Record the list of abiotic and biotic parts on the board for students’ reference throughout this lesson sequence.
- Invite students to record their ideas about the lesson sequence focusing question or learning targets under the “Opening” section of their student science notebook.

Preparing to Teach: Self-Coaching Guide

1. My students created a list of the parts of an ecosystem in Lesson Sequence 2. That list may be useful here.

Section 1: Obtaining Information

A. Viewing “Forests” (10 minutes)

- Tell students that they are going to watch a video to observe the abiotic and biotic parts of an ecosystem interacting. Explain that similar to reading a complex text, they will view the video several times, each time for a different reason. While watching it the first time, they should focus on determining the gist and noting any unfamiliar vocabulary, and they should record these things in the “Obtaining Information” section of the Parts of an Ecosystem entry in their student science notebooks ⁽¹⁾.
- Show “Forests.”
- Ask students to turn and talk to an elbow partner:
“What is the gist of the video?” (Forests have lots of parts that interact.)
- Before showing the video for a second time, tell students you would like them to think about the following ⁽²⁾:
“What are the abiotic and biotic parts of this ecosystem?” (abiotic: water, wind, shade, temperature; biotic: trees, shrubs, grasses, animals)
“How do the abiotic and biotic parts interact?” (Animals must respond to changes in temperature; grasses and shrubs can be covered in snow.)
- Show the video for a second time, asking students to record their ideas by completing a Venn diagram in the space provided in their student science notebook. Model as necessary ⁽³⁾.
- After 3 minutes, invite students to turn and share their work with an elbow partner.
- After 2 minutes, refocus whole group.
- Using a total participation technique, invite responses from the group ⁽⁴⁾:
“How might these interactions affect the health of the rest of the ecosystem?” (All parts interact with one another; removing one part affects the rest of the system.)
“Is it possible for something to be only in the abiotic or biotic category and never move into the interaction column?” (No, abiotic parts always interact with some biotic part of the system.)
“How does this video demonstrate that an ecosystem is a system?” (All the parts interact and rely on one another.)

Preparing to Teach: Self-Coaching Guide

1. How can I transition to the video quickly and efficiently?
2. After previewing the video, what do I think my students will name and notice?
3. What experience do my students have with Venn diagrams?
4. What additional questions can I ask if my students need help understanding how the abiotic and biotic parts of an ecosystem work as a system?

Section 1: Developing a Model

A. Creating an Ecosystem in a Baggie (30 minutes)

- Draw students' attention to the **Scientists Do These Things anchor chart** and read the first step under the "Develop a Model" column:
 - "A model can be a drawing or model, a physical replica, or a simulation and can be used to explain a process or idea."
- Tell students they will be making a physical replica of an ecosystem by creating an ecosystem in a baggie. Briefly explain what a *physical replica* is (a tangible copy of something).
- Add "Physical replica: ecosystem in a baggie" to the "Develop a Model column" on the Scientists Do These Things anchor chart.
- Tell students that they are now going to watch a video about how to create their ecosystem in a baggie.
- Explain that the video calls this ecosystem in a baggie a "biome in a baggie." Clarify that a *biome* is a specific geographic place with specific abiotic and biotic features. So, this should actually be called an ecosystem in a baggie because the baggie contains abiotic and biotic features working together like an ecosystem, but it is not actually a geographic place, like a biome.
- Tell students that they are going to work with a partner to create their own ecosystem in a baggie that has abiotic and biotic parts so they can make predictions and then observe how they interact.
- Play "**Biome in a Baggie.**"
- Distribute **materials for an ecosystem in a baggie** to each pair of students ⁽¹⁾.
- Play "Biome in a Baggie" for a second time. This time, pause the video after each step so students can follow the directions provided in the video for how to build the ecosystem.
- Circulate and monitor student collaboration and cooperation for creating their ecosystems in a baggie.
- Invite students to open their student science notebooks to the Parts of an Ecosystem entry and find the "Ecosystem in a Baggie" section.
- Ask students to record the biotic and abiotic parts of their ecosystem in a baggie and make a prediction about how they think these parts are going to interact ⁽²⁾.
- As groups finish, direct them to write their names on a piece of masking tape and then place the tape on their baggie.
- Have each group place their ecosystem in a baggie in a pre-determined location in the classroom, such as close to a window.
- Tell students they will return to the baggies throughout the module to make observations about the way the abiotic and biotic parts interact.

Preparing to Teach: Self-Coaching Guide

1. What experience do my students have with seeding plants? Will they need more instruction than what the video provides?
2. Some of my students may want to draw a model to describe their prediction. They may do this on a piece of paper and staple or tape it into the notebook.

Section 2: Evaluating Information

A. Scientists Meeting: Building Understanding (20 minutes)

- 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.
- Direct students’ attention to the posted Life Science Module guiding question and read it aloud:
 - “How do we assess and improve the health of an ecosystem?”
- Share with students that the goal of today’s meeting is to build understanding around the parts of an ecosystem and how they interact ⁽¹⁾.
- Using a total participation technique, invite responses from the group:
“What abiotic parts exist in our schoolyard?”
“What biotic parts exist in our schoolyard?”
- As students share out, draw and label each part on a piece of poster board or chart paper to create the **Schoolyard Ecosystem Poster-Size Explanatory Model**. Refer to the **Schoolyard Ecosystem Explanatory Model: Model for Lesson Sequence 5 (for teacher reference)** for guidance ⁽²⁾.
- Remind students that a good explanatory model has labels and arrows. Right now, the model contains only labels, but as they learn more, they will revise the model to add arrows.
- Direct students’ attention to the “Systems” column on the **Concepts Scientists Think About anchor chart**.
- Remind students that an ecosystem is a type of system and that scientists spend a lot of time thinking about systems.
- Explain that because they are doing the work of scientists, they are going to summarize what they have learned and add it to the anchor chart.
- Ask students to Think-Pair-Share with an elbow partner. Remind them that they used this protocol in Lesson Sequences 2 and 3, and review as necessary. Refer to the Classroom Protocols for the full version of the protocol:
“What are the different parts of ecosystems we have talked about so far?” (abiotic: temperature, water, soil; biotic: plants and animals)
“Think about the Venn diagram we created about the ‘Forests’ video. How do the abiotic and biotic parts interact to create the ecosystem?” (Each part is affected by other parts.)
- As students share, capture their ideas on the Concepts Scientists Think About anchor chart. As you record, indicate how the parts work together as a system and that if one part was removed, the system would not work as well ⁽³⁾.
- Be sure that the idea “An ecosystem is a system because it is made of many parts that work together” is recorded under the “Systems” column on the Concepts Scientists Think About anchor chart.
- Provide students with time to write down their thoughts or copy big ideas from the Concepts Scientists Think About anchor chart into the “Building Understanding” section of their student science notebook.

- After 3 minutes, tell students they will keep thinking about systems throughout the Life Science Module and their understanding will grow and change. Now they are going to turn their attention to thinking about the abiotic and biotic parts of specific ecosystems.

Preparing to Teach: Self-Coaching Guide

1. What classroom systems do I have in place that can accommodate observation of the schoolyard? Can I take the students outside? If I can't take my students out to the schoolyard, can I bring in pictures of the schoolyard?
2. With what level of detail are my students making observations? How can I encourage them to be more thorough?
3. What additional examples of abiotic and biotic features working together can I bring up if my students cannot articulate how the parts work together?

Section 2: Obtaining Information

A. Collecting Information for Expert Ecosystems (30 minutes)

- Move students into pre-determined ecosystem expert groups. Explain to students that they are going to work in these groups for the remainder of the Life Science Module to become experts about a particular forest ecosystem.
- Invite students to record their assigned forest ecosystem in their student science notebook under the heading “Collecting Information for Expert Ecosystem.”
- Distribute **Parts of a Forest Ecosystem** and explain that they are to use the tables on this handout to gather information about the abiotic and biotic parts of their assigned ecosystem.
- Ask students to record the parts of their expert ecosystem in the abiotic/biotic table in their student science notebook.
- After 5 minutes, refocus the whole group.
- Tell students that within their groups, they are each going to be assigned a role so that they can become an expert on a particular part of their ecosystem.
- Reveal roles or provide time for students to choose their roles: climatologist (climate), pedologist (soil), zoologist (animals), or biologist (plants). If there is a group of three, all students will take on the role of zoologist together, in addition to their other role.
- Tell students they are now going to share a computer with their expert group to view a webpage ⁽¹⁾.
- Once students have accessed the webpage, advise them to scroll down to the section titled “Types of forests.” Explain that from here, they will need to continue to scroll down to get to the section about their assigned ecosystem.
- Further explain that students are to use this website to collect information about their expert ecosystem’s climate, soil, animals, and plants based on their expert role (climatologist, pedologist, zoologist, biologist). As they collect information, they should record it in their student science notebook in the table provided. Model as necessary.
- After 10–15 minutes, give students specific positive feedback on their work as researchers. (Example: “I saw you reading and rereading to find the information you needed.”)

Preparing to Teach: Self-Coaching Guide

1. What additional support will my students need to gather information from a website?

Section 3: Developing a Model

A. Developing an Expert Ecosystem Explanatory Model (30 minutes)

- Remind students that in Lesson Sequence 3, they created an explanatory model as a class to explain the process of photosynthesis.
- Direct students' attention to the "Modeling" column of the Scientists Do These Things anchor chart. Tell students that they are going to create an explanatory model about their ecosystem with their expert group, and their model will include pictures and labels of the abiotic and biotic parts of their ecosystem.
- Invite students to move to sit with their ecosystem expert groups.
- Distribute **poster board** and instruct students to record their assigned forest ecosystem (temperate, boreal, or tropical) as well as the names of all group members on the back corner of the poster board.
- Remind students to use the information about their ecosystem that they recorded in their student science notebook to begin their explanatory model ⁽¹⁾.
- Encourage students to take time and care with constructing their models, as they will continue to add to and use these models throughout the Life Science Module ⁽²⁾.
- Invite students to begin working on their expert ecosystem explanatory model.
- Circulate to support students, reminding them, as necessary, that explanatory models should include labels and arrows to make their ideas clear to others.
- After 20–25 minutes, collect and post the explanatory models until the next lesson sequence.

Preparing to Teach: Self-Coaching Guide

1. Based on my observations of the students creating models in Lesson Sequences 3 and 4, what support will they need here? What potential problems will they encounter?
2. What questions can I ask to help students create a quality product?

Section 3: Evaluating Information

A. Scientists Meeting: Building Understanding (20 minutes)

- Ask students to bring their science notebooks and gather for a Scientists Meeting.
- 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 ⁽¹⁾.
- Direct students' attention to the posted Life Science Module guiding question and read it aloud:
 - “How do we assess and improve the health of an ecosystem?”
- Share with students that the goal of today's meeting is to build their understanding of how parts of an ecosystem interact in a healthy ecosystem.
- Explain that they will evaluate the information they have collected through the reading, videos, and class conversations in order to build their understanding about what makes a healthy ecosystem.
- Draw students' attention to the **Criteria for Healthy Ecosystems anchor chart**.
- Invite students to Think-Pair-Share with an elbow partner ⁽²⁾:

“What interactions did you observe in all of the ecosystems we've observed?” (The abiotic and biotic features work together. Students should give specific examples.)

“How might these interactions help an ecosystem be healthy?” (Plants and animals can survive because of the specific temperature and precipitation and nutrients in the soil.)

“What might happen if the abiotic features changed (e.g., it suddenly stopped raining)? Would the plants and animals survive?” (No, because their needs wouldn't be met.)
- As students share out, capture their ideas on the Criteria for Healthy Ecosystems anchor chart ⁽³⁾.
- Invite students to return to their seats and turn to the **Anchoring Phenomenon entry** in their student science notebook and put their finger on the “Scientists Meeting” section.
- Ask students to revisit their initial thinking about the health of an ecosystem and then add evidence based on information from the reading and conversations in this lesson sequence.

Preparing to Teach: Self-Coaching Guide

1. Based on my experience in previous lesson sequences, what norms do my students need to focus on?
2. How can I help my students use the information collected in their notebook as evidence as they participate in this conversation?
3. Which specific students will I try to draw into the conversation?

