

Lesson Plan: Busy Beaver

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Target Grade: K

Teacher Prep Time: 15-20 minutes

Lesson Time: 1 hour 30 minutes (We recommend doing this lesson over 3 days, 1 part per day.)

- Part 1: The Busy Beaver
 - 5 minutes - Pre-assessment
 - 10 minutes - See, Think, Wonder
 - 15 minutes - *The Busy Beaver* Read Aloud & Discussion
 - 10 minutes - Argument Scale Poster Introduction
- Part 2: At Home with the Beaver
 - 5 minutes - Refresh of Argument Scale Poster
 - 10 minutes - Beaver Impact
 - 10 minutes - Beaver Needs
- Part 3: Creating an Argument
 - 15 minutes - Whole Group Argument Practice & Crafting of Individual Arguments
 - 5 minutes - Sharing Argument Practice
 - 5 minutes - Self Reflection of Pre-assessment

Where This Lesson Fits in:

This lesson could be a part of a larger unit about interdependent relationships in ecosystems, between animals (including humans), plants, and their environment. This lesson only covers part of the NGSS performance expectation (how animals change the environment). Therefore, an extension of this assignment should be completed, in the same or a different format, to cover how plants change the environment to meet their needs.

Lesson Overview:

Students will gather information about how beavers change their environments via read alouds, shared discussions, and multimedia presentations. They will make connections between beavers' needs and actions, and then they'll pair selected information (evidence) to support a claim about beavers changing their environment to meet their needs.

Learning Objective(s):

- Students will utilize observations to identify how beavers change their environment to meet their needs and how these actions might affect the rest of their environment.
- Students will be able to make a claim about how beavers' actions could be helpful or harmful and use evidence to support their claim.
- Students will be able to explain that the effect of an action could be helpful or harmful, depending on whose perspective is being considered.
- Students will be able to evaluate other students' claims and respond with evidence to support or refute these claims. Students will then re-evaluate their initial argument and make an evidence-informed claim that takes into account the evidence of others.

NGSS:

- **Performance Expectation**
 - K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

- **Science and Engineering Practice**
 - #7 Engaging in argument from evidence
 - Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).
 - Analyze why some evidence is relevant to a scientific question and some is not.
 - Construct an argument with evidence to support a claim.
- **Disciplinary Core Idea**
 - [K-ESS2.E](#): Biogeology
 - Plants and animals can change their local environment.
- **Cross Cutting Concept**
 - #2 Cause and effect
 - In grades K-2, students learn that events have causes that generate observable patterns. They design simple tests to gather evidence to support or refute their own ideas about causes.
- **Common Core State Standard**
 - [CCSS-ELA-LITERACY.RL.K.10](#) & [CCSS-ELA-LITERACY.RI.K.10](#)
 - Actively engage in group reading activities with purpose and understanding.

Materials Needed (see start of lessons sequence for suggested students per group):

- 1 pre-assessment worksheet (per student)
- 1 student argument worksheet (per student)
- 3-4 pond and dam images (select from slideshow compilation)
- 1 classroom argument scale poster (for group display and discussion) sammi indicate size
- 1 copy of *The Busy Beaver* book by Nicolas Oldland (for read aloud)
 - Or use this [slideshow](#)
- 1 copy of *At Home With the Beaver* book by Dorothy Hinshaw Patent (pages 1-6 and 21-28 for additional references and discussion) and/or access to the slideshow
- 5 cartoon images of beaver behaviors for class analysis with the poster (choose your own or use the [suggested images](#))
- 5 photographs of real-life beaver behaviors for additional class analysis with the poster (choose your own or use the [suggested images](#))

Teacher Prep:

- In preparation for the lesson, print and copy the pre-assessment and argument student worksheet for each student. Images from the “See, Think, Wonder” exercise can be printed out for display if the slideshow won’t be projected during the lesson. The classroom argument scale poster can be enlarged and printed out for display, or the teacher can draw it directly on the whiteboard instead. Images (cartoon and photograph forms) for group analysis and placement on the argument scale poster need to be printed out as well. When applicable, teachers will write discussion sentence frames on the board or write them out on sentence strips for display in. Gather the recommended books or access the attached Google Slides presentations, as needed.

Lesson Sequence:

* For this activity we recommend having students work in groups of two, having students work by themselves, and having whole group discussions, as is outlined in each part of the lesson below.

Part 1: The Busy Beaver

5
minutes

Pre-Assessment

- Hand out the pre-assessment worksheet, which contains four images (a felled tree, a dam, a beaver, and a flooded pond).



- Instruct students to circle the thumb that best represents the image. Tell students, "If they think the image is showing something helpful, they will circle the thumbs up. If they think the image is showing something harmful, they will circle the thumbs down. And if they think the image contains both helpful and harmful things, they will circle the thumb to the side. Model each of these thumb positions with your hand while you talk about them.
- If students ask you to define what helpful and harmful means, you may tell them, but do not sway them in a certain direction, as they will return to these assessments at the end of the lesson.
- Collect the pre-assessments (but save them for Part 3).

10
minutes

See, Think, Wonder

- Tell students that over the next few days we are going to be park rangers who will study our environment to see how it changes due to the behavior of beavers in the area.
- Tell students, "I am going to show you a series of pictures of beavers and their environment. When I show you each picture, I want you to look for things that you see happening, things that you think are happening, and things that you're still wondering about the picture." Project the "See, Think, Wonder" [slideshow](#) for them.
 - If you will not be projecting the slideshow, show them the pond and dam printed images.
- Guide the students through the "See, Think, Wonder" exercise by asking students to share what they see happening in the picture, what they think is happening in the picture, and what they wonder about the picture.



- As students are sharing their thoughts for each image during the activity, ask them, “Are the things you are seeing in these pictures harmful or helpful? Why might they be helpful or harmful?”

- Do not define helpful and harmful for them here. You want them to consider that something in the image could be helpful for one organism and harmful to another, but they will come to that conclusion as a group later.

10
minutes

The Busy Beaver Read Aloud

- Tell the students, "We will now read a book to learn more about beavers." If you have a copy of the book, gather the students to read it to them. There is also a slideshow showing the book pages you can project in the lesson resources.
- Read the book, *The Busy Beaver*.
 - As you read to the students, pause to check for students' understanding by asking them to rephrase what is happening in certain scenes.
 - Pause to have students recognize the other animals in the image.



- Make sure students understand that it would be unlikely that a beaver would mistake a moose's leg for a tree.



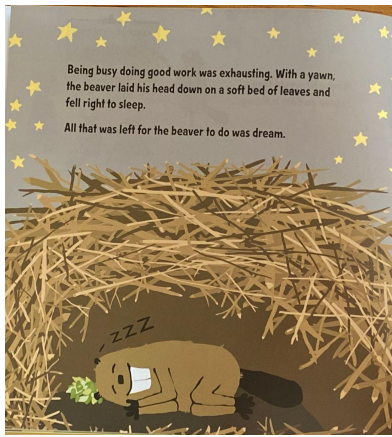
- Ask students, "Do beavers have a hospital they can go to when they get hurt?" Lead them to understand that beavers cannot check themselves into hospitals.



- Ask students, "How did the beaver change his behavior in these scenarios?"






- Lead students to understand that the beaver's home is the dam he was building.



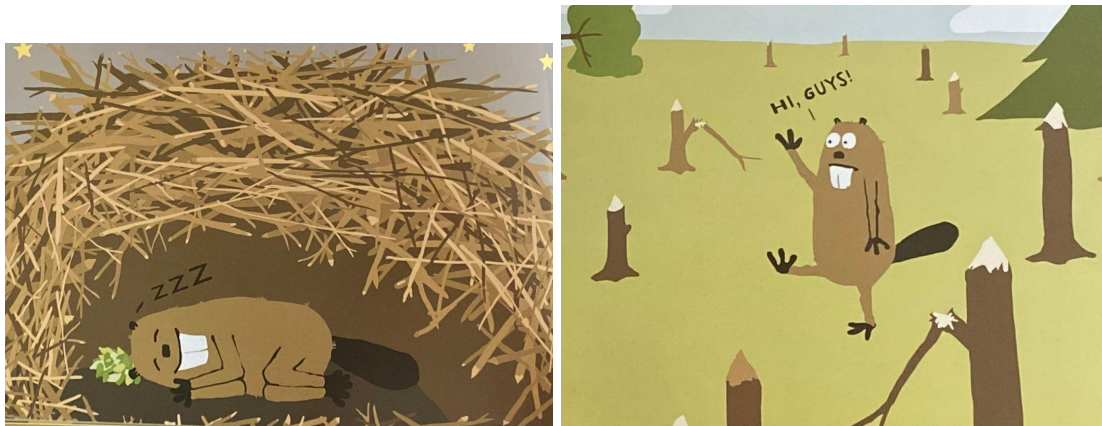
20
minutes

Argument Poster

- Introduce the large Argument Scale Poster by telling students, “We will now start to categorize the beaver’s behaviors in the story as either helpful, both helpful and harmful, or harmful.” Show students each column and make sure they understand what they represent.

Helpful	Both	Harmful
		

- Choose five images from the story that show beavers’ different behaviors. You can choose any five, but we recommend the ones listed below and linked in the slideshow [here](#).





- Introduce one image at a time, and ask the students to describe the beaver's behavior, or, in other words, what the beaver is doing in the scene. Ask, "Is the beaver's behavior helpful, harmful, or both?"
- Have the students move to one of three positions in the classroom that will represent "helpful", "harmful", or "both", depending on how they would like to vote for where the beaver's behavior should be placed on the argument scale. Then, have students give you their thumb as either up, to the side, or down to check that they are in the right place. Tally the votes in a chart on the board.
- Before placing the image on the argument scale, tell students, "We will need to have evidence to support our claim of whether the behavior of the beaver is helpful, harmful or both. Does anyone know what evidence is?" Reveal the following sentence frames (either on the board or shared on the screen) and read them to the students. I recommend having them written on a slide so as not to take up space. You can find our slide (with animation to reveal the frames one at a time) in the Busy Beaver Poster Images [slideshow](#).
 - "The beaver's behavior is helpful because ____."
 - "The beaver's behavior is harmful because ____."
 - "The beaver's behavior is both helpful and harmful because ____"
- Tell students that in their groups, they will share their thinking as to why the behavior of the beaver is either helpful, harmful, or both. Tell them that they

should pay special attention to the effects of the beaver’s behavior when trying to come up with this evidence.

- Give students a few minutes to talk with their groups before asking them to share their thoughts. Call on each group and have one student present their argument.
- As each group presents their argument, work with the class to fit the argument into the following sentence frame: “The beaver did (specific behavior), which caused (effect). This is (helpful/harmful/both).”
 - Do not share this frame with the students so as not to confuse them. Instead, help them verbally think through the cause and effect relationship.
- After a group presents their argument, ask if any of the other groups agree or disagree with what that group presented. Remind them that if they want to convince the other group’s of their beliefs, they need to talk respectfully to them. Tell the students that they should respond to another group using the following sentence frames for help (reveal these on a slide or on the board):
 - “I agree with you because ____.”
 - “I respectfully disagree with you because ____.”

Sentence Frames






To support your claim:

- “The beaver’s behavior is helpful because _____.”
- “The beaver’s behavior is harmful because _____.”
- “The beaver’s behavior is both helpful and harmful because _____.”








To argue for or against your classmates’ claim:

- “I agree with you because _____.”
- “I respectfully disagree with you because ____.”

- After hearing all of the arguments, tell the students, “It is okay to change your belief on a topic after hearing others’ points of view. If you were convinced by another classmate to change your opinion, you can move to a new area.” So the students again the three areas of the classroom (helpful, both, or harmful) and give them a few seconds to move to another area, if needed.
- Before re-tallying the votes, ask a few students who moved to share why they changed positions. Then, re-tally the votes and place the image on the Argument Poster in the column with the most votes.

Helpful	Both	Harmful
		
		

- Repeat this process for the other 4 images. Some examples are shown below.
 - Example: cutting down trees kills them.
 - Example: flooding helps create a home for other animals, etc.

Helpful	Both	Harmful
		
 		

- End the lesson by telling the students, “Next time, you will gather more evidence about the beaver’s actions, so that you all can make sure that you understand the whole story of how a beaver affects its environment.”

Part 2: At Home with the Beaver

5
minutes

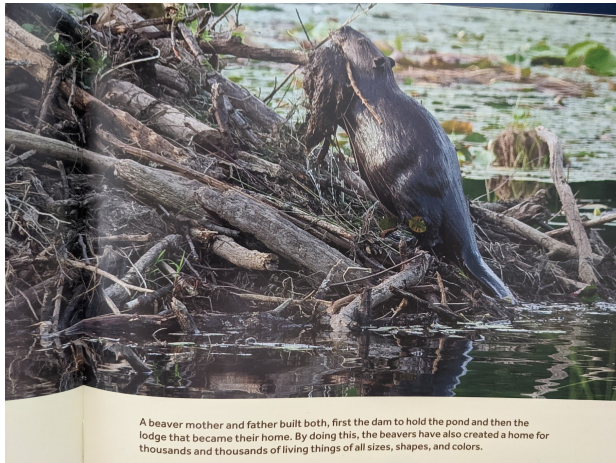
Review of Argument Poster

- Guide the students through a review of each of the five images on the poster, using the vocabulary of cause and effect. Example: “When the beaver cut down the tree, it caused the birds to lose their home.” This should be similar to the process you did on the previous day in which you helped students format their evidence statements in terms of cause and effect.

20
minutes

Beaver Impact

- Open the *At Home with the Beaver* Google Slides [presentation](#) to guide the students in gathering more information about the actions and impacts of beavers. After you read each page to them, pause to ask the students to identify the beaver’s behavior in terms of cause and effect language. Pause your reading on slide 12 (page 4)
 - Ex: The beaver family built the dam, which caused a pond to form.



- Show students the matching images from the [suggested images](#), or your choice of images of real-life beavers. Ask the students, “Find the image from yesterday’s book, *The Busy Beaver*, on the Argument poster that matches with the real life image I’m holding.” Have ~3 students come up to the Argument Poster to choose the matching image together. An example is shown below




- Have the students show the class the image they chose, and explain why they chose that image. They should include specific evidence from both pictures.
- Continue through each picture until all of the images on your Argument Poster have a matching set.
- Ask the students, “There are many ways beavers impact their environment. Why might a beaver do so much to modify its environment? What is the benefit from doing that?”
- Allow students to share their responses. They can find evidence of modifications from the Argument Poster.
 - ESR (one of many answers): Beavers need a place to live, so they need to build a dam to build their house on.
- Then ask students, “Are there any other actions or behaviors of a beaver that we haven’t seen in these images that may indicate how a beaver impacts their environment?” Have students share their responses in the group. It’s okay if they cannot come up with anything extra here.

10
minutes

Beaver Needs

- After the students share their predictions, continue with the Google Slides presentation (Slide 14) that shows more ways that beavers change their environments to meet their needs.
- Play the clip of a beaver in action (Slide 17), and ask students to make observations of the beaver’s actions and how they meet the beaver’s needs.
- For each example, have the students form an argument in the same style as Part 1 regarding the behaviors of the beavers. Guide them to discuss the beaver’s actions in terms of cause and effect utilizing the following sentence frame: “The beaver (specific behavior), which caused (effect). This is (helpful/harmful/both).”

Part 3: Creating an Argument

<p>15 minutes</p>	<p>Whole Group Argument Practice</p> <ul style="list-style-type: none"> ● Tell the students, “Now that you have practiced forming arguments about the beaver’s actions, you need to consider whether being helpful or harmful depends on who is being affected by the change. You are now going to create another argument about how beavers change their environment to meet their needs.” ● Give students the following sentence frames and complete an example with them: “A beaver changes its environment by _____. This is helpful/harmful to the beaver because _____. This is helpful/harmful to the environment because _____” (Example: A beaver changes its environment by building a dam. This is helpful to the beaver because it creates a pond for the beaver to live in. This could be helpful to stop floods.) Highlight how this sentence says that this change is helpful/harmful specifically to the beaver. ● Pass out the Argument Practice worksheet, the students will form an argument about how beavers change their environment and whether that is helpful or harmful to the beaver and then to the environment. Similar sentence frames will be used, as were previously modeled by the teacher. Additionally, students will draw in their image of what this change looks like in the box at the top of the page. See the Example Student Work for a filled out page. <p style="text-align: center;">Name: _____</p> <p style="text-align: center;">Argument Practice</p> <div style="text-align: center;">  </div> <p style="text-align: center;">A beaver changes its environment by _____.</p> <p style="text-align: center;">This is helpful👍/harmful👎 to the beaver because _____.</p> <p style="text-align: center;">This is helpful👍/harmful👎 to the environment because _____.</p>
<p>5 minutes</p>	<p>Sharing Argument Practice</p> <ul style="list-style-type: none"> ● Have students pair up to share their argument they just created with another student by reading it and showing their partner the picture. ● Remind students that if they want to respond to an argument, they should use evidence to either agree or disagree with that argument. Tell the students that they should respond to each other using the following sentence frames for help (reveal these on a slide or on the board): <ul style="list-style-type: none"> ○ “I agree with you because _____.” ○ “I respectfully disagree with you because _____.”

5
minutes

Reflection of Pre-Assessment



- Hand back the students' pre-assessment from the first day.
- Tell the students, "We are going to compare our answers from before the lesson to what we think now to see if our opinions of what is helpful and harmful have changed." Have students circle what they think now in a different color than they used on the first day.
- Ask students to share their initial answer using thumbs up/down/sideways and then to share if their answer has now changed. Call on a few students to share their argument. "I used to think ___ and now I think ___, because _____."
- Remind students that scientists will often change their ideas about what they are studying when they get new evidence that either agrees or disagrees with what they believed before. This is a good thing because then that means they understand more and more about what they study and can better inform others.

Example Student Work:




Name: Tom

Busy Beaver Pre-Assessment

Directions: Look at each picture and decide if it shows something:


 helpful,  both, or  harmful.

Circle the thumb that matches your idea about each picture in the boxes below.

Name: Tom

Argument Practice



A beaver changes its environment by
building a dam.

This is helpful / harmful to the beaver because
it give them a place to live.

This is helpful / harmful to the environment because
trees can't grow there anymore.

Busy Beaver Pre-Assessment

Name: Tom

Directions: Look at each picture and decide if it shows something:



Circle the thumb that matches your idea about each picture in the boxes below.
