



Photo credit: photographer name photographer name

Activity 1: Making Connections

After watching a media-rich slide show featuring sounds, images, and video clips related to the Southern Residents and their environment, students draw connections to discover what they will be learning about throughout this unit. Students then brainstorm what they need to know in order to answer the unit's driving question: How can we make a difference for the critically endangered Southern Resident killer whales?

Key Student Questions

- What is the connection between the sounds, videos, images, and graphs?
- What future do you want to see for the Southern Residents?
- What do you need to know to answer the driving question?

Key National Standards

NGSS

- [LS2.A](#): Interdependent Relationships in Ecosystems
- [ESS3.C](#): Human Impacts on Earth Systems

CCSS

- CCSS.ELA-LITERACY.RI.[6.7](#)
- CCSS.ELA-LITERACY.CCRA.[SL.2](#); CCSS.ELA-LITERACY.SL.[6.2](#), [7.2](#)

Keywords

Endangered species—Animals or plants that are in danger of becoming extinct.

Extinct—Animals or plants that have died out completely.

Pollutant—Any substance introduced to the environment that adversely affects the health of an organism, the health of an ecosystem, or the usefulness of a resource.

Supporting Vocabulary

Bioaccumulation—An increase in the concentration of a chemical in a biological organism over time, compared to the chemical's concentration in the environment. The source of the chemical can be from the water, soil, sediment, or air the organism interacts with or from the food it eats.

Biomagnification—A process that results in the accumulation of a chemical in an organism at higher levels than are found in its food. It occurs when a chemical becomes more and more concentrated as it moves up through a food chain.

Marine mammals—Warmblooded animals that live in marine waters and breathe air directly. These include porpoises, dolphins, whales, seals, and sea lions.

Introduction

1. Ask students to close their eyes and envision what it might feel like to see the Pacific Ocean for the first time. What might they hear, smell, or see? What might they be thinking? What kind of energy might they be feeling?



Materials

- **Slide deck**
Making Connections
- **Worksheet**
[Making Connections](#)
Pg 26-27
1 per student
- A large sheet of paper or dedicated white-board space for the driving question

2. Ask for a few students to share their thoughts.
3. Share with the class that they are about to embark on a quest to learn about one of the Pacific Northwest's marine icons.

Note: We will be referring to the Canadian province of British Columbia and the U.S. states of Washington, Idaho, Oregon, and Northern California as the "Pacific Northwest."

Activity

1. Arrange students into groups of 3-4.
2. Give each student a copy of the [Making Connections](#) worksheet and walk through the directions as a class.
3. Project the *Making Connections* slide deck.
4. Use the speaker's notes to guide the activity. The slide deck is broken out into seven sections, which correspond to the worksheet.

Listen (Slide 2)

During the Listen portion, students will listen to five audio recordings. Play each clip no more than two times. Give students a minute or two to complete the "Listen" portion of the handout. Give students 1-2 minutes to share their thoughts with their group. At this point, do NOT debrief as a class.

Look (Slides 3-6)

During the Look portion, students will be shown four groups of images. Briefly show each slide and then give students a minute to complete the "Look" section of their worksheet. Give students 1-2 minutes to share their thoughts with their group. At this point, do NOT debrief as a class.

Learn (Slides 7-9)

During the Learn portion, students will be shown three figures. The titles have been omitted as to not influence the students' answers. Briefly show each slide and then give students a minute to complete the "Learn" section of their worksheet. Give students 1-2 minutes to share their thoughts with their group. At this point, do NOT debrief as a class.

Link (Slides 10-11)

During the Link portion, students will review their notes from the activity. They will try to determine the thread that ties all of the data, photos, videos, and sounds together (i.e., Southern Residents). Give students a few minutes to complete the "Link" section of their worksheet independently. Afterward, give small groups a few minutes to discuss their ideas. One representative from the group should be ready to summarize their group's thoughts with the class.

Reveal (Slides 12-20)

During the Reveal portion, use the speaker's notes to describe the data, photos, videos, and sounds that were presented in the Listen, Look, and Learn portions of the presentation.

Looking Ahead (Slide 21)

During the Driving Question, students will review the proposed driving question and brainstorm what information they need to know to answer the question. Write down student responses on a large sheet of paper or dedicated whiteboard space. Keep these questions accessible for the remainder of the unit.

5. Bring the class back together.
6. Share that as of July 2021 only 75 Southern Residents remain. These charismatic creatures are critically endangered.

Note: For the most current population count, visit: www.whaleresearch.com/orca-population.

- In popcorn format, ask the class why small population sizes might be a problem. *Inbreeding, a new disease could harm or kill the entire population, a catastrophe such as an oil spill could wipe out the entire population, etc.*
- Tell students that they will spend the next ____ classes studying Southern Residents. They will learn about their life history, why their population has declined, and what people can do to make a meaningful difference. At the end of the unit, students will use their newfound knowledge and passion to design a campaign or stewardship project to help the Southern Residents.

Discussion Questions

- What are your initial impressions about the Southern Residents? How do you feel after learning a little bit about them?
- People have a storied past with killer whales. They used to be killed by non-tribal fishers for competing with fisheries. Until relatively recently, they were captured for display in zoos and aquariums. Why might public perception have changed?
- The capture of Southern Residents contributed to their population decline. Could there be any benefits to keeping some Southern Residents in captivity? *Studying their behavior, raising awareness of the population, building empathy for marine mammals, etc.*
- If someone lives inland (i.e., not on the coast), should they still care about marine life? Why or why not?
- How are you connected to the Southern Residents?

Share Your Students' Work

Help inspire Southern Resident conservation around the globe by sharing your experience with this unit. Tag photos, student work, and student quotes.

- Facebook: [@NOAAFisheriesWestCoast](https://www.facebook.com/NOAAFisheriesWestCoast)
- Twitter: [@NOAAFish_WCRO](https://twitter.com/NOAAFish_WCRO)
- Instagram: [@NOAAFisheries](https://www.instagram.com/NOAAFisheries)



Additional Resources



[Article: The Hunger Games: Two Killer Whales, Same Sea, Different Diets](#)

The Salish Sea's resident killer whales are in trouble, but transient killer whales traveling the same waters seem to be doing fine.

[Blog: Southern Resident Connections](#)

Join NOAA Fisheries in exploring the ecological connections that tie this system together, and the ways we are protecting and working to recover the whales we care so much about.

[Video: Inside the killer whale matriarchy \(5:03\)](#)

Each killer whale family is able to survive thanks mainly to one member, its most knowledgeable hunter: the grandmother. These matriarchs can live 80 years or more and their expertise can mean the difference between life and death for their families.

[Video: Spotighting Southern Resident Killer Whales \(3:01\)](#)

Learn how NOAA research advances an intense effort to understand, provide new data, and minimize threats to them.

Name: _____ Date: _____ Class: _____

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Part I: Listen

Directions: Listen carefully to each sound. Describe what might be making each sound.

Sound 1: _____

Sound 2: _____

Sound 3: _____

Sound 4: _____

Sound 5: _____



Part II: Look

Directions: Look carefully at each image. Describe what might be shown in each image.

<p>Group 1</p> <p>1</p> <p>2</p> <p>3</p>	<p>Group 2</p> <p>4</p> <p>5</p>
<p>Group 3</p> <p>6</p> <p>7</p> <p>8</p>	<p>Group 4</p> <p>9</p> <p>10</p>



Part III: Learn

Directions: Describe what might be shown in each figure.

Figure 1	Figure 2	Figure 3



Part IV: Link

Directions: Review the Listen, Look, and Learn sections. Compare and contrast the sounds, images, and figures. What might be the common thread that links all of these together?



Part V: Looking Ahead

1. Write the driving question below:

2. What do you need to know to answer the driving question?

3. What future do you want to see for these iconic animals?
