### National Standards

**GEOGRAPHY**
- **Element 2: Places and Regions**
  - 4. The physical and human characteristics of places
- **Element 3: Physical Systems**
  - 7. The physical processes that shape the patterns of Earth's surface
  - 8. The characteristics and distribution of ecosystems and biomes on Earth's surface
- **Element 5: Environment and Society**
  - 14. How human actions modify the physical environment
- **Element 6: The Uses of Geography**
  - 17. How to apply geography to interpret the past
  - 18. How to apply geography to interpret the present and plan for the future

### AZ Standards

**ELA**
- **Reading Key Ideas and Details**
  - 2.RI.3 With prompting and support, describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.

**MATHEMATICS**
- **Measurement and Data**
  - 2.MD.D.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units

**SCIENCE**
- **Life Science**
  - 2.L2U1.9 Obtain, analyze, and communicate evidence that organisms need a source of energy, air, water, and certain temperature conditions to survive.

### Arizona Social Science Standards

**GEOGRAPHY**
- **Human-environment interactions are essential aspects of human life in all societies.**
- **Global interconnections and spatial patterns are a necessary part of geographic reasoning.**
  - 2.G2.2 Describe how human activities affect the communities and the environment of places or regions.
  - 2.G4.1 Identify different physical and cultural regions in the world.

### SIOP Elements

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Where Have All the Creatures Gone?

Arizona English Language Proficiency Standards
Grade 2
Basic
Listening and Reading
Standard 1 By the end of each language proficiency level, an English learner can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing.
B-1: ask and answer questions by using evidence from a text.
B-3: identify key details that support the main idea or message.
B-5: identify and describe similarities and differences between two texts.
Standard 2 By the end of each language proficiency level, an English learner can determine the meaning of words and phrases in oral presentations and literary and informational text.
B-1: determine the meaning of frequently occurring academic and content-specific words and phrases.
Speaking and Writing
Standard 3 By the end of each language proficiency level, an English learner can speak and write about grade appropriate complex literary and informational texts and topics.
B-3 compose informational text that includes details to develop a topic while using appropriate conventions.
Standard 4 By the end of each language proficiency level, an English learner can construct grade appropriate oral and written claims and support them with reasoning and evidence.
B-1 express an opinion on a topic or text.
B-2: supply a reason that supports the opinion and is based on some textual evidence.
B-3: use grade-appropriate words and phrases, including frequently occurring adjectives and adverbs.
Listening, Speaking, Reading, and Writing
Standard 6 By the end of each language proficiency level, an English learner can participate in grade-appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.
B-1: participate in discussions about familiar topics and texts.

Overview
As the years go by, our world is being impacted by climate change more and more. Animals in the aquatic environment of the Hudson Bay are a case study of species that are or will be impacted over time with the increase in temperatures and environmental changes.

Purpose
In this lesson, students will investigate how a group of animals in the Hudson Bay are impacted by climate change through time. This lesson includes strategies for diverse learners.

Key Vocabulary
environmental stressor: something that is hurting the environment
prey: an animal that becomes food for another animal

predator: animal that lives by killing other animals for food
climate change: changes in the Earth’s weather patterns
tundra: a flat area of land in the northern parts of the world where there are no trees and the ground is always frozen
greenhouse gases: gases on our Earth that absorb more heat, so the Earth is getting warmer

Materials
• Dice
• Student Readings
• Reading Worksheet
• Math Activity
• Internet
• Check for Understanding
• Grading Rubric
• Vocabulary Cards
• Vocabulary Test and Answer Key

Objectives
The student will be able to:

1. Locate specific details found in the readings.
2. Create a line plot.
3. Describe the impact of climate change over time.

**Procedures**

Students should have been introduced to the different biomes animals can live, specifically the Arctic regions. Students should know how to create line plots.

**SESSION ONE**

**Engage:**

1. Introduce the lesson by telling students that the temperatures in many areas of the world are getting warmer and this rise in temperature is affecting animals. Have students share why this matters with people at their table. Then discuss this idea as a whole class and list some of the ideas on the white board. (Preparation: Linking to prior learning, Grouping Option: Small and Whole group) Take care not to explain at this stage.

**Explore:**

2. Project the digital map https://arcg.is/100X1D to display the various animals that will be reading about and to show the area that the animals live in. Do not take time to explain the information but rather tell students that they will soon read four short texts with a partner.
3. Distribute the Student Readings and Reading Worksheet to partner groups. (Grouping Option: Partners)
4. Explain that they should read the texts together and record the required information on the Reading Worksheet related to predators, prey, and ideal temperatures for each animal. (Integrating Process: Reading, Writing)
5. Before sharing the answer with the whole group, have partners get together with another set of partners and share their findings. (Integrating Process: Speaking, Listening)

**Explain:**

6. In a whole group setting, ask students the same question as before: “Why does the temperature on Earth getting warmer matter to the animals that you just read about?” Have students share their ideas and compare these to the ideas already recorded on the white board. (Integrating Process: Speaking, Listening)

7. Now tell students that we call the change in temperature “climate change” and show them the following video. https://tinyurl.com/y8zb6blw

*Note: At this time, other maps and resources can be used to help build student knowledge. If a student asks about global warming, let them know that it is part of climate change, but global warming is only focused on the change in temperature.*

8. Distribute the Vocabulary Cards or project them. Introduce the other vocabulary words and refer to the images especially the image of the tundra in order to show what it looks like. (Scaffolding: Comprehensible input)

9. A Ticket out the Door might be an oral vocabulary quiz. (Assessment: Oral)

**SESSION TWO**

**Elaborate:**

10. Refresh students’ memory of what they learned yesterday but asking a few questions about the animals they studied and how temperature mattered to the animals. (Preparation: Linking to prior learning,

11. Tell students that today they will look at how temperature change might happen over ten years in the Hudson Bay Area. Show students on a world map where the Hudson Bay is located. Reinforce the idea that this area is made up of tundra and an Arctic Ocean environment. (Scaffolding: Comprehensible input)

12. Distribute the Math Activity to partner groups. Tell them that they will take turns rolling, and that each roll represents one year of change in temperature for the summer season. Model the first year. (Scaffolding: Modeling, Grouping Option: Partners)

13. Partners will then take turns rolling and adding and subtracting the temperatures and recording their numbers. (Application: Hands on)

14. When students finish collecting the data, the partners will draw a line plot on the worksheet. (Application: Linked to objectives)

15. Have each set of partners share with the class their final summer temperature. Ask students what would happen to the animals that they studied. Have them work with their partners to identify which animals would still be able to survive and what problems they may have. Share conclusions with the whole class. (Integrating Process: Speaking, Listening)

**Evaluate:**

16. Pass out the Check for Understanding and the Grading Rubric. Explain the writing prompt using...
Where Have All the Creatures Gone?

another one of the four animals used in the lesson. **(Scaffolding: Modeling)** Thoroughly explain the Grading Rubric. Have students work in partners or independently to complete the Check for Understanding assignment.

17. On the same day or later, have students complete the Vocabulary Test. **Assessment: Individual or group, Written**

**Assessment**

**ELA, Geography and Science**
The Vocabulary Test can be graded. Mastery will be considered 80% or higher.
The Check for Understanding can be graded. Mastery will be considered a 3 or higher on the Grading Rubric.
The Reading Workshop can be graded. Mastery will be considered 75%.

**Geography and Mathematics**
The Math Activity Sheet can be graded. Mastery will be considered 75% or higher.

**Extensions**

Have the students identify the mode and calculate the mean.

Read: *Winston of Churchill: One Bear’s Battle Against Global Warming* by Jean Davies Okimoto.

Have students make posters to inform people about climate change or have students write a letter from the perspective of one of the arctic animals studied.

**Sources**

Canadian Storymap platform: [www.arcgis.com](http://www.arcgis.com)

Dice Clipart
[https://homeschoolclipart.com/math/dice-clipart/](https://homeschoolclipart.com/math/dice-clipart/)

Churchill Northern Science Centre:
[https://www.churchillscience.ca/](https://www.churchillscience.ca/)
(This is the location where I conducted the research.)

National Wildlife Federation:

Sacramento Splash:
[https://www.sacsplash.org/critter/fairy-shrimp](https://www.sacsplash.org/critter/fairy-shrimp)