



Data and Art!

1. Lesson Overview

Resource Summary	Students will combine art and science to interpret and illustrate graphs demonstrating the connection of Arctic vegetation data to climate change. This is lesson 3 of a 3 lesson mini unit.
Grade Level/ Subject	Grades 6-8 Biology/Life Science
Time Frame	3 lessons (50-60 minute class periods)
Materials and Preparation Needed	<ul style="list-style-type: none">● Arctic Ecosystem● Climate Change● Data Analysis/Interpretation● Art Integration

2. Learning Goals

Lesson Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none">● <u>Explore</u> different graphs and the data they contain.● <u>Interpret</u> information from various graphs.● <u>Apply</u> information from data (graphs) to create their own art project.● <u>Describe</u> the arctic ecosystem and research being done to gather information about climate change.● <u>Explain</u> their understanding of the data and their art by completing an artist's statement.● <u>Analyze and illustrate</u> graphs to explain research and climate change.
Standards	<p><u>Next Generation Science Standards</u></p> <p><u>Performance Expectations</u></p> <p>MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.</p> <p>MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.</p> <p><u>Disciplinary Core Ideas</u></p> <p>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</p> <p>ESS3.D Global Climate Change</p> <p><u>Crosscutting Concepts</u></p> <p>Patterns</p> <p>Systems & System Models</p> <p><u>Practices</u></p> <p>Analyzing and interpreting data</p> <p>Obtaining, evaluating, and communicating information</p> <p>Key Concepts: Arctic Ecosystem, Climate Change, Data Analysis/Interpretation, Art Integration</p>

Polar Literacy Principles

3B-4: Snow and ice in Polar Regions are involved in mainly positive feedbacks, which is why the Arctic region is annually warming faster than the rest of the planet.

6B-2: Climate change- air and ocean temperature changes at the Poles affect people around the world through global ecosystem changes.

7B-1: This baseline information is coupled with regular scientific explorations to the Poles to collect samples and measurements, including photographic evidence.

7C-1: Combining current data with historical data, scientists can construct models to understand connections in the past and improve predictions of future environmental conditions at the Poles.

View the [Polar Literacy Principles here](#).

3. Educational Resource Procedure

Opening Activity

Watch "[Where to Start with Art](#)" (3:50 minute video) to learn about science and art from professional artist Alisa Singer, who believes climate change to be the most critical challenge facing our world and sought to find a way to use her art to further efforts to bring awareness to the issue. She was attracted by the inherently aesthetic design elements of scientific charts and graphs, and intrigued by the idea of using art to give them dramatic effect.

Activity Procedure

Day 1

1. Lead students through the [Google Slides](#) to analyze graphs and discuss the artwork.
2. Use the [ITEX-AON website](#) for information about each graph.
3. Then, provide a [graph](#) for a group of students. Have them analyze the data and complete the [graph analysis worksheet](#).
4. If you have time today, provide each student with a graph of their choice OR each group can do the same graph (one for each student). They will use this graph to illustrate their interpretation tomorrow.

Day 2

1. Review with students the graphs and art from yesterday.
2. Lead students into a discussion about the graphs and their meaning. Hopefully, students will understand that they all relate to vegetation growth and climate change.
3. Today students will be starting a rough draft of art associated with their graph. Make sure they choose something that relates to the graph and climate change. They are welcome to re-copy the graph onto a piece of white or graph paper and then start a rough draft of their illustration.

Day 3:

1. Review their graph from yesterday. Provide time for students to finish their rough draft and then work on their final draft.
2. When finished with their graph illustration, students can write an “Artist’s Statement.” This should be a paragraph explaining their art.
3. More time? Students can do another graph OR improve their first one.
4. If the class has time, conduct a gallery walk to admire each graph.

Reflection

Day 1 Reflection: Explain TWO trends from your specific graph.

Day 2 Reflection: Explain WHY art helps people understand science.

Day 3 Reflection: Explain HOW this helps to understand climate change.

Make sure students turn in their final graph/artwork with their artist’s statement for a summative or formative grade. Use this [rubric](#) for grading.

At the end of class, have students answer these questions:

Think about this entire week and all you have learned about the Arctic. Write down ONE new thing you have learned and ONE question!

References

- ITEX-AON: [ITEX-AON a collaborative research project - Grand Valley State University \(gvsu.edu\)](https://www.gvsu.edu/itex-aon/)
- North Slope Borough Wildlife Management: <https://www.north-slope.org/departments/wildlife-management/>
- Polar Literacy: <https://polar-ice.org/>
- Polar STEAM: <https://polarsteam.info/>

- Next Generation Science Standards (NGSS): <https://www.nextgenscience.org/>
- Monterey Bay Aquarium Research Institute (similar lesson with an oceanography focus): <https://www.mbari.org/lesson-plan/whats-the-bigger-picture/>

Supporting Documents

Mini Unit PPT
ITEX Graphs
Graph Analysis Worksheet
Artist Statement Rubric
[Environmental Graphiti](#)
[SMILE Graphiti](#)