



The Bio/Diversity Project

Data Science Outreach Curriculum Fall 2025 Lesson 4: Mapping Heat: Visualizing Environmental Patterns

Based on: [How to Read a Heat Map](#), [CalAcademy: Conservation Island](#)

Grade Level: 8th

Time: 50 minutes

AZ Science Standards:

- 8.U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.
- 8.E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.

Student Facing Learning Objectives:

- I can match light/temp/humidity to physical locations on a classroom map
- I can contribute to a visual heat map using colored dots based on environmental data.
- I can interpret patterns in environmental data and suggest real-world applications

Guiding Questions:

- How can we use maps to understand environmental conditions?
- What can maps show us about our environment?
- Why would knowing how light and temperature vary across space matter for animals, people, or solar panels?

Vocabulary:

- Heat map - a chart that uses colors to represent data values in a table or physical map; used to measure factors beyond temperature
- Data visualization
- Abiotic factors

Materials:

- Completed worksheets from lesson 3 (with student data and maps)
- [L4 Worksheets](#)
- Large butcher paper - for map of the classroom, optionally draw ahead of time
- Colored sticky dots (three colors) - use these to create a legend before class
- Tape
- Markers
- Slideshow
- [L4 Slides_Energy](#)



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🌵 Lesson 4: Mapping Heat: Visualizing Environmental Patterns 🌻

Mini-Lesson (10-15 minutes)

- **Review**
 - Hand back Lesson 3 worksheets
 - Students measured light, temp, humidity
 - **What is a heat map?**
 - Show example of a heat map (JPL/NASA or local weather heatmap)
 - Way to turn numbers into a picture so we can see patterns
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Work Time (20-25 minutes)

1. Class mapping activity

- One group at a time comes to the butcher paper map
- Each group identifies their two measurement points from Lesson 3
- Group places colored sticky dots, based on the legend/key, on their locations
 - Red = hottest
 - Blue = coolest

2. Students work in groups or individually:

- Analyze the classroom heat map
- Use the **lesson 4 worksheet** to answer questions
 - Use the timer in the slideshow presentation to help students manage their time
 - Part 1: Class Heat Map
 - Review the color scale with the class if some groups forget what their colors represent.
 - Prompt students to **look for clusters** of red or blue dots
 - If students are stuck, ask questions like:
 - “Which direction are the windows facing?”
 - “Is this area near a fan, vent, or projector?”
 - “Did this area get hit by sunlight during class?”
 - Part 2:
 - Definition of a heat map
 - A map that uses color to show how a value changes across space.
 - Units today
 - °F
 - Night-time change prediction



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- Likely biggest change: areas near windows/exterior walls.
 - Reason: no solar radiation at night, these areas cool relative to day.
- Also plausible: areas near electronics if devices are turned off, less heat.

3. Review Lesson 4 Worksheet Answers

- You might not need to review every question/answer, but depending on time and the questions you saw students struggling with, regroup the whole class to review answers from the worksheet.

Wrap-Up (5-10 minutes)

Blooket game: heat maps

<https://dashboard.blooket.com/set/68f92547b23b1551fcb766e0>

If there is still extra time, consider playing one of these [brain break games](#) OR doing a Q&A time where students can ask you about college, what you're studying, and your time at UA.