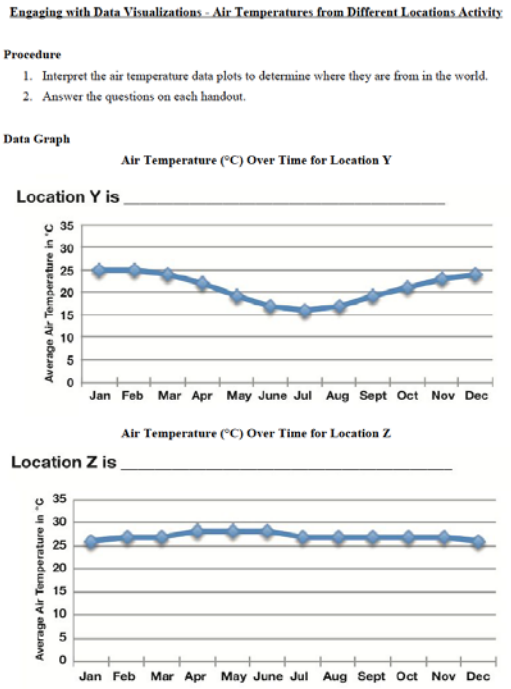
Engaging with Data Visualizations

Air Temperature

Overview

Students investigate air temperature data across different, mystery locations. Students are introduced to data visualizations. *Note: this student activity explicitly applies the 3 Levels of Engagement with Data.*



Engaging with Data Visualizations - Air Temperatures from Different Locations Activity

Procedure

1. Interpret the air temperature data plots to determine where they are from in the world.
2. Answer the questions on each handout.

Data Graph

Air Temperature (°C) Over Time for Location Y

Location Y is _____

Air Temperature (°C) Over Time for Location Z

Location Z is _____

Learning Outcomes

Students will be able to:

- Orient to, interpret, and synthesize air temperature data across different mystery locations.

Data Resources:

- This activity has students engage in explorations of real-time and archived water quality and weather data collected as part of the National Estuarine Research Reserve (NERR) System Wide monitoring Program (SWMP).

NGSS and Climate/Ocean Literacy Connections

- **Disciplinary Core Ideas**: MS.ESS2.D: Weather and Climate
- **Science and Engineering Practices:** Analyzing and Interpreting Data
- **Crosscutting Concepts:** Patterns

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Engaging with Data Visualizations – Air Temperature

Overview

A student investigation of air temperature data across different, mystery locations is provided to introduce students to data visualizations. *Note: this student activity explicitly applies the 3 Levels of Engagement with Data.*

Materials Needed

For the class

- PowerPoint presentation
- Digital/data projector
- Whiteboard or flip chart paper and pens
- (For facilitator: Answer Key: Engaging with Data Visualizations - Air Temperatures from Different Locations)

For student pairs

- Engaging with Data Visualizations - Air Temperatures from Different Locations Activity (each page copied single sided to be passed out in succession)
- Earth is heated unevenly handout

Preparation of Materials

Duplicate handouts. Make enough copies of the following handouts for

1 per student:

- Earth is heated unevenly handout

For student pairs:

- Engaging with Data Visualizations - Air Temperatures from Different Locations Activity (each page copied single sided to be passed out in succession)

Session at a Glance

Activity: *Engaging with Data Visualizations – Air Temperature*	Students work with a partner and engage in a short activity to explore data through an investigation of Air Temperature data across different, mystery locations. Note: this activity explicitly applies the 3 Levels of Engagement with Data to help students successfully navigate a data visualization and complete the mystery activity to facilitate their understanding of the data and results.	30

Session Details

Activity: *Engaging with Data Visualizations - Air Temperatures*

Note to teacher: *this activity explicitly applies the 3 Levels of Engagement with Data to help students successfully navigate a data visualization and complete the mystery activity to facilitate their understanding of the data and results.*

1. **Introduce Activity**. Explain that students will work with a partner and do a short activity to explore data by looking at air temperature from two mystery locations.

2. **Hand out procedure and data graphs.** Provide each partner group with a worksheet of the procedure and the data graphs (Page 1 of "*Engaging with Data Visualizations - Air Temperatures from Different Locations Activity*" handout). Have students read through the procedure and ask if anyone has any clarifying questions.

3. **Distribute 'Earth is Heated Unevenly' handout.** Briefly explain the handout and tell students that this information may be a helpful reminder when they are working through the activity.
    - The Sun heats Earth unevenly.
    - Places near Earth's equator are generally warmer than the poles.
    - Places near Earth's equator change less in temperature from winter to summer than places near the poles do.
    - When it's summer north of the equator, it's winter south of the equator. When it's winter in the north, it's summer in the south.

4. **Begin the activity**. After students have read through the procedure, distribute the *Engaging with Data Visualizations - Air Temperatures Activity Handout A: Orientation* (Page 2). Walk around while the students perform the activity (*refer to the* "*Engaging with Data Visualizations - Air Temperatures Activity Answer Key" if desired*).

5. **Data Interpretation Handout**. As the groups finish *Handout A: Orientation*, provide them with *Engaging with Data Visualizations - Air Temperatures Activity Handout B: Interpretation* (Page 3) to complete.

6. **Data Synthesis Handout**. As the groups finish *Handout B: Interpretation*, provide them with *Engaging with Data Visualizations - Air Temperatures Activity Handout C: Synthesis* (Page 4) to complete.

7. **Activity wrap-up; discuss results and conclusions.** After students complete the last handout, regain the attention of the class to briefly discuss their results and conclusions about the locations of where these air temperature data were collected.

8. **Quick Write reflection**. Have students do a quick write on the following questions to reflect on the activity related to the levels of engagement with data visualizations:
    - What skills did you need to be successful with each step of the activity – answering the orientation questions, answering the interpretation questions, and then answering the synthesis questions?
    - Which questions were the easiest or most difficult for you and your partner to answer? Why?
    - What kinds of things helped you to solve the mystery?

9. **Sharing reflections**. After 5 minutes, invite students to share aspects of their reflections with the class. Remember to ask if anyone:
    - wrote something similar or different, and/or
    - wants to add something else to the conversation.

    Encourage students to continually think back to these three levels of engagement with data visualizations (orientation, interpretation and synthesis) as they continue to explore with data.