Analyzing and Interpreting Data

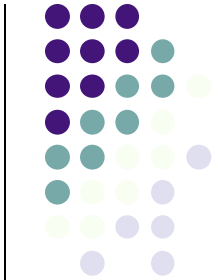
BOSTON Public Schools
Focus on Children

Agenda

1. Defining Analyzing and Interpreting Data
2. Thermal Energy Activity
3. Video Example and Discussion
4. Continuum for Student Performance
5. Reflecting on Instructional Strategies

- **Extension Activity – Connection to Other Science Practices*

Defining Analyzing and Analyzing Data

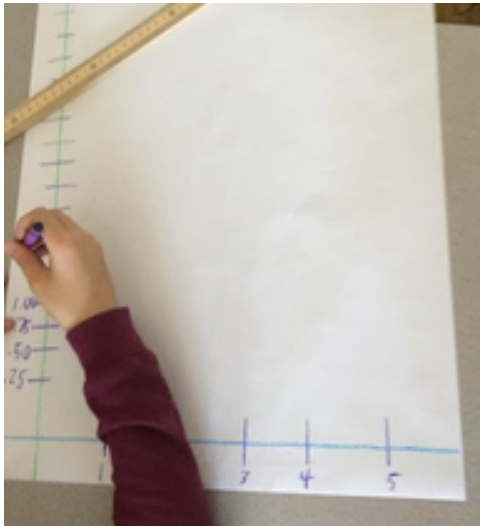


- Think-pair-share:
  - What do you think “analyzing and interpreting data” looks like in a science classroom?
  - What are students doing?
  - What is the teacher doing?

Defining Analyzing and Analyzing Data

- The Instructional Leadership for Science Practices Website defines this practice as students:

…making sense of the data produced during investigations. Because patterns are not always obvious, this includes using a range of tools such as tables, graphs, and other visualization techniques.



Thermal Energy Activity

This activity targets the following standards:

- Determine the relationship among the energy transferred, how well the type of matter retains or radiates heat, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample [MS-PS3-4]
- Explain how heat energy is transferred by convection, conduction, and radiation. [Introductory Physics Standard 3.1]

Thermal Energy Activity

The Task:

- Work in small groups to complete the activity, and answer the conclusion questions

Material	Time (hr)	Temperature (°C)
Stainless Steel	0.0	100
Stainless Steel	0.5	85
Stainless Steel	1.0	72
Stainless Steel	1.5	61
Stainless Steel	2.5	58
Iron	0.0	100
Iron	0.5	77
Iron	1.0	62
Iron	1.5	50
Iron	2.5	38

Afterwards discuss:

- How did you analyze and interpret data during the activity? What types of things did you do?
- Re-examine questions “a” through “e” on the activity handout. Which of these question(s) do you think focus most on “analyzing and interpreting data”? Why do you think so?

**This activity was adapted from the MCAS High School Physics 2015 Spring Release*

Video Example and Discussion

- Watch the video below, which focuses on a classroom engaged in an activity around the question – *Why do some parachutes fall more slowly than others?*

- Discussion Questions:
  - What did the teacher do to promote this science practice?
  - What did the students do that highlights or builds on skills related to this science practice?

Continuum for Student Performance

Examine the progression below, and discuss the following questions:

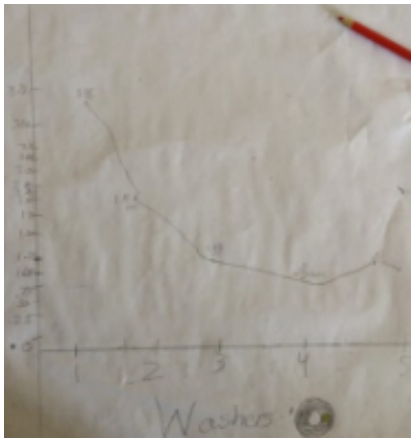
- Do you agree with the progression? Why or why not?
- What are examples of what these different levels might look like in the classroom?
- How would you rate your students current engagement in this science practice using this progression?

Level 1	Level 2	Level 3	Level 4
Students may record data, but do not analyze data.	Students work with data to organize or group the data in a table or graph. However, students *do not recognize patterns or relationships* in the natural world.	Students work with data to organize or group the data in a table or graph. Students make sense of data by *recognizing patterns or relationships* in the natural world.	Students *make decisions* about how to analyze data (e.g. table or graph) and work with the data to create the representation. Students make sense of data by *recognizing patterns or relationships* in the natural world.

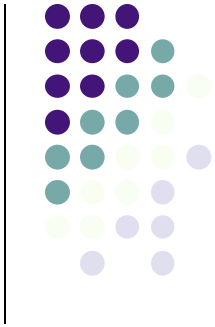
Reflecting on Instructional Strategies

Read through the Instructional Strategies handout. Select one strategy that you have tried, or would like to try, in your own classroom. In small groups, discuss the following questions:

- What strategy did you select?
- How do you think this strategy would support your students' learning of and engagement in this science practice?
- What challenges do you think you might face when using this strategy in your classroom? How might you overcome these challenges?



Extension Activity – Connection to Other Science Practices



Look through the list of science practices. Brainstorm, and then share out, ways that "analyzing and interpreting data" connects with the other science practices.

Investigating Practices

- Asking questions
- Planning and carrying out investigations
- Using mathematical and computational thinking

Sensemaking Practices

- Analyzing and interpreting data
- Constructing explanations
- Developing and using models

Critiquing Practices

- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information