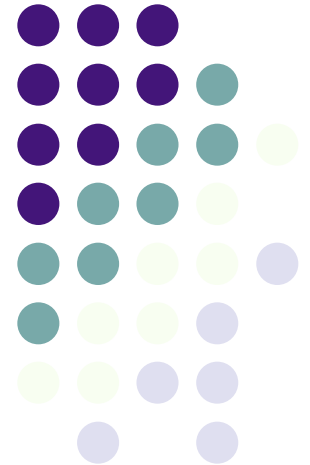
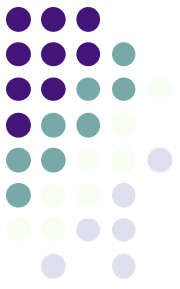


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# Conclusion Module to the Science Practices

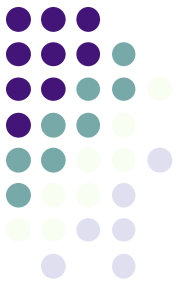




# Agenda

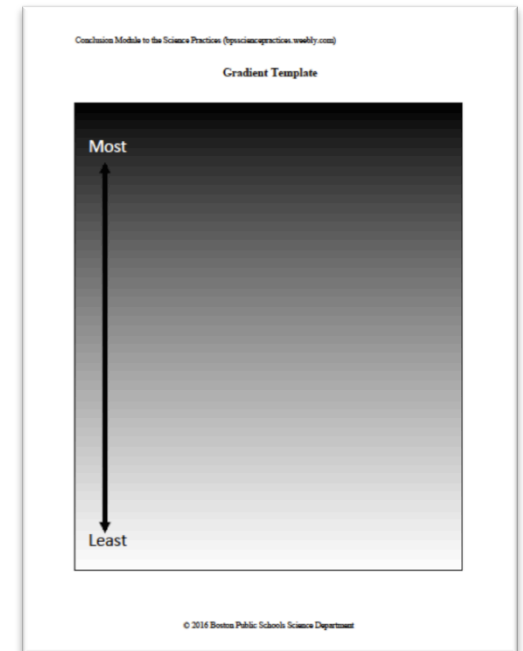
1. Science Practices Card Sort
2. Examine a Classroom Vignette
3. Analyze a Video
4. Discussion
  - \* *Extension Activity – Creating a Representation of the 8 Science Practices*
  - \* *Extension Activity – Analyze a Current Lesson Plan*

# Science Practices Card Sort

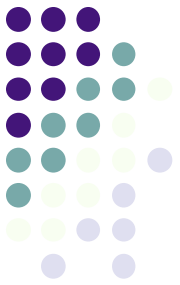


## The Task:

- Use the Science Practices Cards and the Gradient Template to reflect upon your current science instruction. Specifically, rank the cards in order for the science practice that is most prevalent in your classroom to the science practice that is least prevalent in your classroom.
- Afterwards, pair up with another person and share how you ordered your cards. As you share, make sure to explain the rationale behind your ranking.

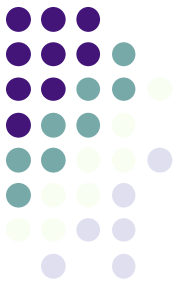


# Science Practices Card Sort



## Discussion Questions:

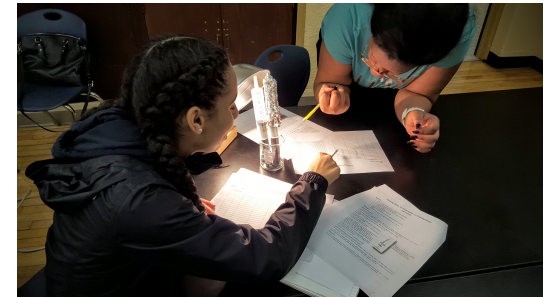
- What science practices do you currently incorporate most frequently? Why?
- What science practices do you currently incorporate least frequently? Why?
- What are some strategies you could use to include some of the more rare science practices in your instruction?



# Examine a Classroom Vignette

## The Task:

- Examine the classroom vignette, which comes from [this website](#)
- Identify which of the science practices you see students engaged in. Remember, the science practices include:
  - Asking questions
  - Planning and carrying out investigations
  - Using mathematical and computational thinking
  - Analyzing and interpreting data
  - Constructing explanations
  - Developing and using models
  - Engaging in argument from evidence
  - Obtaining, evaluating and communicating information
- Afterwards, share out which science practices you saw students engaged in and where in the vignette you saw them.



# Analyze a Video

- One key difference in the new science standards is that students should be doing the science practices (not just the teacher)
- New science standards show a shift in describing students “learning about” to “figuring out” science phenomena
- The NGSS Implementation Guidelines handout describes this shift in more detail

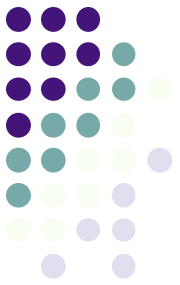
Conclusion Module to the Science Practices (<https://sciencepractices.usability.com>)

NGSS Implementation Guidelines

This table was taken from the National Research Council's 2015 *Guide to Implementing the Next Generation Science Standards*. It describes some of the main shifts that will take place as science practices become integrated into classroom instruction.

| <p>“Learning about”<br/>Science Education will involve less...</p>  | <p>→</p> <p>“Figuring out”<br/>Science Education will involve more...</p>  |
|---|--|
| <ul style="list-style-type: none"><li>• Rote memorization of facts and terminology</li><li>• Learning of ideas disconnected from questions about phenomena</li><li>• Teachers providing information to the whole class</li><li>• Teachers posing questions with only one right answer</li><li>• Students reading textbooks and answering questions at the end of the chapter</li><li>• Preplanned outcomes for “cookbook” laboratories or hands-on activities</li></ul> | <ul style="list-style-type: none"><li>• Facts and terminology learned as needed while developing explanations and designing solutions supported by evidence-based arguments and reasoning</li><li>• Systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned</li><li>• Students conducting investigations, solving problems, and engaging in discussions with teachers’ guidance</li><li>• Students discussing open-ended questions that focus on the strength of the evidence used to generate claims</li><li>• Students reading multiple sources, including science-related magazines, journal articles, and web-based resources. Students developing summaries of information</li><li>• Multiple investigations driven by students’ questions with a range of possible outcomes that collectively lead to a deep understanding of established core scientific ideas</li></ul> |

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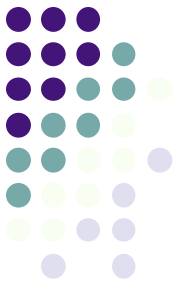


# Analyze a Video

## The Task:

- Watch the first few minutes of the video below, which is from a middle school science classroom. This video is from a lesson on decomposition in which students are providing their initial explanations of what is occurring to strawberries that have been left in a bag
- As you watch the video, keep in mind the following questions:
  - Do you see any science practices in this video? If so, where did you see them?
  - What are the roles of the teacher and the students?
  - How well do you think this video encompasses the shift from “learning about” to “figuring out”?
  - What are some ways the initial discussion could have been revised to include a greater focus on science practices?

# Analyze a Video



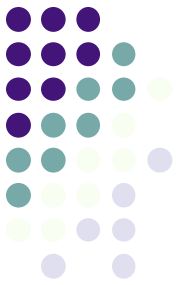
## Discussion Questions:

- Do you see any science practices in this video? If so, where did you see them?
- What are the roles of the teacher and the students?
- How well do you think this video encompasses the shift from “learning about” to “figuring out”?
- What are some ways the initial discussion could have been revised to include a greater focus on science practices?



This image is from the video





# Discussion

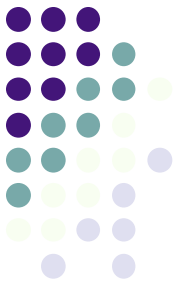
Some key points about the science practices are:

- Science practices are a significant shift in instruction that will take time and support to implement into current instruction.
- This shift includes a greater focus on student directed instruction in which students use evidence to make sense of the natural world (i.e. “learning about” versus “figuring out”).
- The practices work synergistically together and not in isolation.
- The potential gain is greater when one does not try to do too much – students cannot attend to all of the practices at the same time. It is okay for a lesson to focus on one or two science practices

## Discussion Questions:

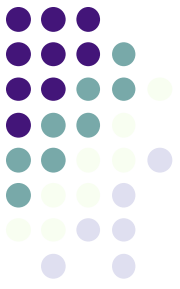
- What questions do you still have about the science practices?
- What supports might you need to better integrate science practices into your instruction?

# Extension Activity – Creating a Representation of the 8 Science Practices



## The Task:

- Work in small groups to develop a representation of the eight science practices. Consider the relationships between the science practices and how you might convey these relationships to teachers less familiar with the science practices.
- Share out your representations.
- Afterwards, discuss the strengths and weaknesses of the different representations.



# Extension Activity – Analyze a Current Lesson Plan

## The Task:

- Share a lesson plan from your current science curriculum to evaluate in terms of the science practices. Make copies of the lesson plan for others to read.
- While analyzing the lessons, consider:
  - What science practices are included?
  - How student directed is the lesson?
- You may choose to use the [Science Practices Continuum](#) from the ILSP website to focus your analysis and evaluate the level of opportunities for student engagement in the science practices.