The Argumentation Toolkit: Multimedia resources for supporting student engagement in scientific argumentation

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argumentationtoolkit.org

THE ARGUMENTATION TOOLKIT

Agenda

1. Welcome and introduction
2. Video: Using evidence to consider competing claims
3. Activity: Mystery fossil card sort
4. Introducing *The Argumentation Toolkit*
5. Session Takeaways

This presentation's PowerPoint and handouts can be found at lisamarcobujosa.weebly.com under the "Professional Development " tab

1. Introductions

- Introductions
  - Grades/subject areas that you teach
  - Familiarity with scientific argumentation

Not familiar

Very familiar

Session Goals

1. Introduce the four areas of argumentation in which students need extra support: 1) *Evidence*, 2) *Reasoning*, 3) *Student Interaction,* and 4) *Competing Claims*.
2. Develop an understanding of argumentation as a *social process* in which students build, question and critique claims using evidence and reasoning.
3. Introduce *The Argumentation Toolkit*, a web resource to support student and teacher learning about scientific argumentation.

Argumentation Elements

EVIDENCE
Students use high quality evidence to support their claims.

REASONING
Students make clear how their evidence supports their claim.

INTERACTIVE
Students build off of and critique each others' ideas.

COMPETING CLAIMS
Students critique competing claims.

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2. Video: Using evidence to consider competing claims

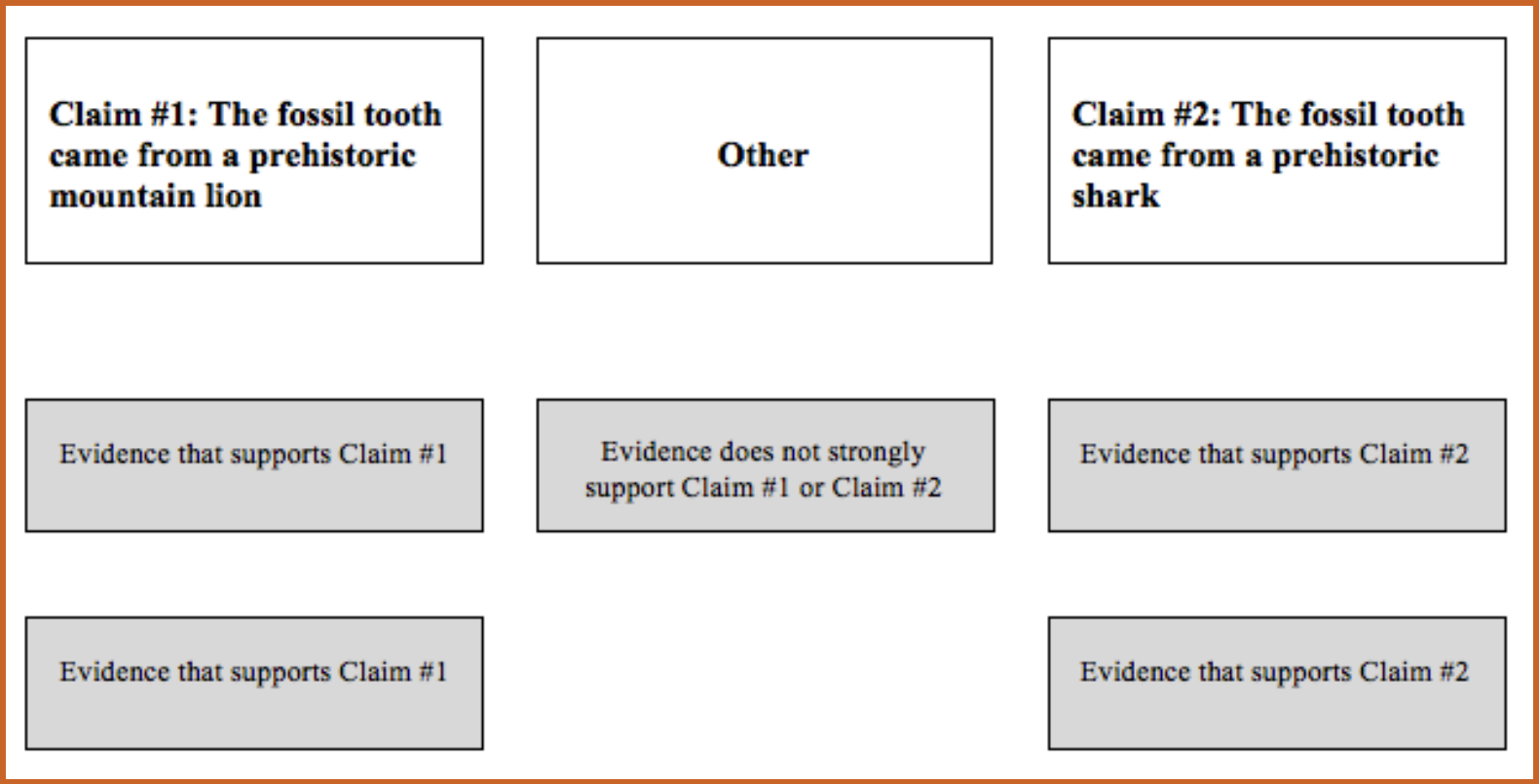
This video focuses on how evidence can be used to evaluate multiple claims

3. Activity: Mystery Fossil Card Sort

The task:

- Work in pairs or small groups to categorize evidence cards as supporting either:
    1. The fossil tooth came from a prehistoric mountain lion.
    2. The fossil tooth came from a prehistoric shark.
    3. Other
- Make sure to articulate *why* you sort cards as you do

Setting up your cards



- Start with Group 1 (white evidence cards); then Group 2 (gray evidence cards)

Discussion about Card Sort

After sorting the cards from Group #1:

- Which claim do you feel is best supported given the existing evidence?

After sorting all the cards, including those from Group #2:

- What did you talk about when you were discussing the evidence?
- Did your conversations change once you received the cards from Group 2?
- How can you envision your students engaging in this activity? What would work well? What challenges would they have?

4. *The Argumentation Toolkit*

Video 2 provides an overview of the resources available on *The Argumentation Toolkit* Website (www.argumentationtoolkit.org) to support teacher and student learning about scientific argumentation.

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4. *The Argumentation Toolkit*

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Organized by Learning Module

The modules each include a sequence of four 45-minute sessions for a total of 3 hours. These can be used for one longer meeting (i.e. 3 hours) or used over multiple sessions (4 sessions 1 month apart, each for 45 minutes). We recommend using the Introductory Module on Scientific Argumentation first. Any of the other modules may be used after the first one depending on the needs and interests of teachers.

Module Name	Description
• Introductory Module on Scientific Argumentation	• Goal - Introduces the four argument elements. • DCI - Life science focused on fossil record (MS-LS4-1, MS-LS4-2) and the human body systems (MS-LS1-3)
• Advanced Module - Science Seminar	• Goal - Introduces the science seminar, an argumentation activity. • DCI - Earth science focused on weather (MS-ESS2-5) and climate (MS-ESS2-6)
• Advanced Module - Designing Rich Argumentation Tasks	• Goal - Introduces four criteria and other considerations when designing rich argumentation tasks • DCI - Life science focused on growth, development and reproduction of organisms (MS-LS1-5) and fossil record (MS-LS4-1)
• Advanced Module - Evidence and Reasoning	• Goal - Supports teachers in helping students overcome common challenges in using evidence and reasoning in scientific arguments. • DCI - Earth science focused on earth processes, such as earthquakes (MS-ESS2-2), the cycling of earth materials (MS-ESS2-1), and the force of gravity (MS-ESS2-4).

4. *The Argumentation Toolkit*

Agenda

The agenda for this module's sessions can be found within each session's page. However, you can also click here for a downloadable version of the agenda that cuts across all four sessions in this introductory module.

Session Name	Description	Length
Session #1: What is the role of evidence in a scientific argument?	This session introduces the four areas of argumentation that students need extra support in, and then focuses specifically on the role of evidence.	45 minutes
Session #2: How does considering competing claims support students' use of evidence and reasoning?	This session illustrates how engaging students in competing claims supports their use of evidence and reasoning, and also deepens their understanding of the science content.	45 minutes
Session #3: What is the role of reasoning in a scientific argument?	This session focuses on the role of reasoning, and introduces an instructional strategy that can help students incorporate reasoning into their written arguments.	45 minutes
Session #4: How do we support students in interacting with peers during argumentation?	This session highlights the interactive nature of argumentation using an activity in which students analyze data with peers.	45 minutes

4. *The Argumentation Toolkit*

Organized by Session

The sessions that make up these modules can also be accessed individually, either by argumentation element (e.g. evidence, competing claims) or by activity (e.g. card sort, student writing). Each session is 45 minutes long. If you do select sessions here, consider the background of the teachers. The sessions pulled from the Advanced Modules assume some familiarity with the argumentation elements. See this organization below.

Session Name	Argumentation Element	Activity
• What is the role of evidence in a scientific argument?	• Evidence	• Card Sort
• How does considering competing claims support students' use of evidence and reasoning?	• Competing Claims	• Cart Sort
• What is the role of reasoning in a scientific argument?	• Reasoning	• Reasoning Tool, Student Writing

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What is the role of evidence in a scientific argument?

Session Goals:

- Teachers will be introduced to four areas of argumentation in which students need extra support: 1) Evidence, 2) Reasoning, 3) Student Interaction and 4) Competing Claims.
- Teachers will develop an understanding of argumentation as a social process in which students build, question and critique claims using evidence and reasoning.
- Teachers will be introduced to a Card Sort as an instructional activity that encourages students to think about what evidence does and does not support a claim.
- Teachers will design a new lesson or revise an existing lesson to integrate argumentation into their science instruction.*
- Teachers will identify areas of argumentation that are challenging for their students.*

*Note: These final two goals are only applicable if the module is implemented as multiple sessions

Agenda:

1. Video: Introduction to module
2. Activity: Mystery card sort 1
3. Video & Discussion: Encouraging talk about evidence
4. Session takeaways

Extension - Try it with your students!

Materials:

1. Detailed agenda for facilitator
2. Card Sort 1

Presentation View

4. Session Takeaways

Evidence is observations or data about the natural world that is used to support claims

Competing claims provide students with an authentic reason to argue

Some pieces of evidence can be stronger than others in support of a claim

Weighing competing claims can encourage students to think about how the evidence supports the claim, and refine their understandings of the science concepts

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More information

Argumentation Toolkit

http://www.argumentationtoolkit.org/

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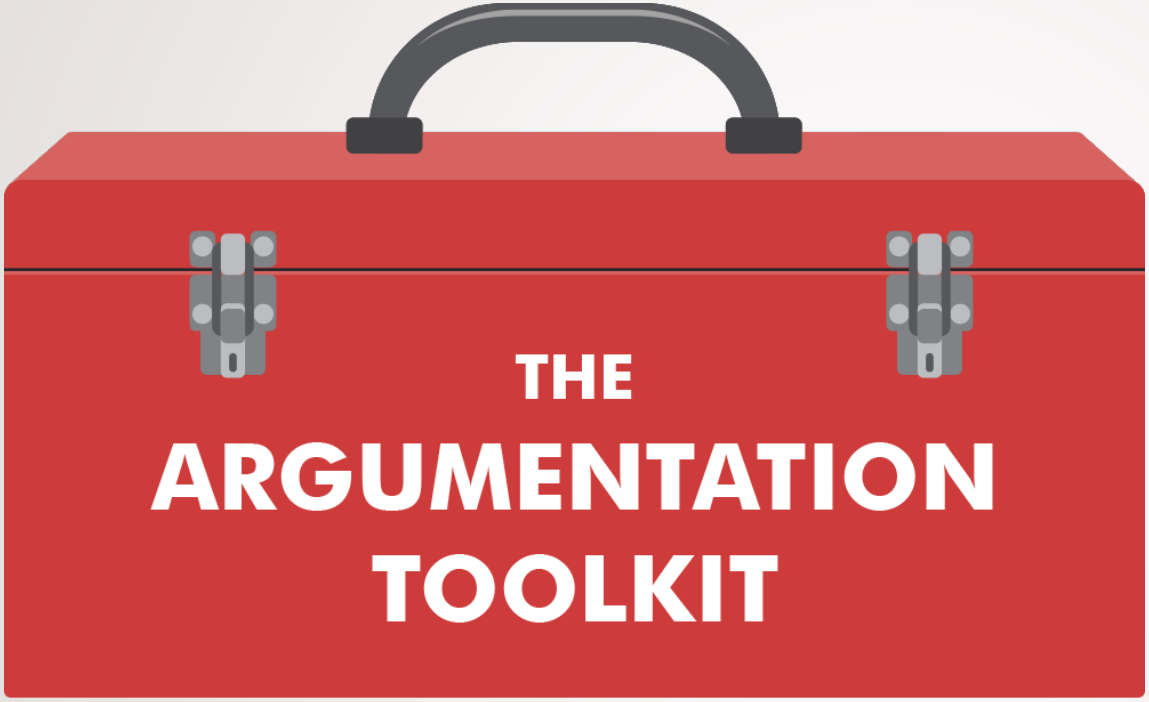

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