

Designing Rich Argumentation Tasks Module



What design criteria support rich argumentation tasks?

Agenda

What design criteria support rich argumentation tasks?

1. Video & Discussion: Designing argumentation tasks
1. Presentation: Criteria for rich argumentation tasks
1. Activity: Analysis of argumentation task
1. Activity: Redesign of argumentation task
- Extension – *Analyze an argumentation task within a lesson!*

1. Video & Discussion: Designing argumentation tasks



Watch the video below of 7th grade students engaged in a partner discussion

Students used a metabolism simulation to gather data and were considering which of the following two claims was better supported by their evidence:

- Abdi's claim – Eating a lot of food before you exercise will give you more energy than eating small amounts of food during exercise
- Desiree's claim – Eating small amounts of food more frequently during exercise will give you more energy than eating a lot of food before you exercise

1. Video & Discussion: Designing argumentation tasks

Discussion Questions:

- During the Introductory Module we covered four elements of argumentation that students may require extra support with. Which of these elements did you see in the video? Where did you see them?
- What criteria do you think the teacher had in mind when designing this rich argumentation task?
- What different criteria do you consider when designing tasks that engage students in argumentation?

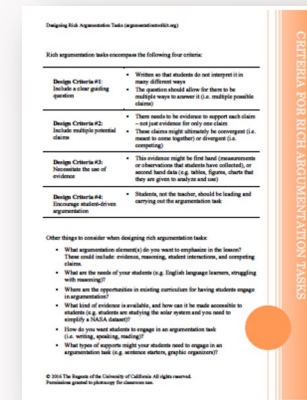
2. Presentation: Criteria for rich argumentation tasks

Key criteria:

1. Include a clear guiding question
2. Include multiple potential claims
3. Necessitate the use of evidence
4. Encourage student-driven argumentation

Other things to consider:

- What argumentation elements do you want to emphasize in the lesson?
- What are the needs of your students?
- What are the opportunities in existing curriculum for having students engage in argumentation?
- What kind of evidence is available, and how can you make it accessible to students?
- How do you want students to engage in an argumentation task?
- What types of supports might your students need?



How the four design criteria unfolded in the video just watched

Design Criteria #1: *Include a clear guiding question*

- Although not explicitly articulated in the video, the task was grounded in the guiding question – *Which option gives you more energy for exercising: 1) eating a lot of food before exercising, or 2) eating small amounts of food more frequently while exercising?*

Design Criteria #2: *Include multiple competing claims*

- Students considered which of two claims is better supported by their evidence:
 1. Abdi's claim – Eating a lot of food before you exercise will give you more energy than eating small amounts of food during exercise
 2. Desiree's claim – Eating small amounts of food more frequently during exercise will give you more energy than eating a lot of food before you exercise

Design Criteria #3: *Necessitate the use of evidence*

- Students gathered evidence from a metabolism simulation, which they needed to use to answer the guiding question

Design Criteria #4: *Encourage student-driven argumentation*

- Students led and carried out the argumentation task, debating over which claim was best supported by their evidence. The teacher was not involved in the task.

3. Activity: Analysis of argumentation task

The Task:

- You will now have an opportunity to evaluate two lessons that include argumentation tasks
- As you read each lesson, keep in mind the design criteria for rich argumentation tasks

Think-pair-share:

- Analyze the two lessons with respect to the four design criteria previously discussed

Designing Rich Argumentation Tasks (argumentationtoolkit.org) - Argumentation Lessons

Lesson #2

In the middle of a unit on density, Ms. Moore had her students conduct an investigation to determine whether different types of balls would sink or float in water. Below is a table the students created after collecting data about the mass and volume of water, a ping-pong ball, a golf ball and a bowling ball. The students then calculated the density of each object by dividing the mass by the volume. Ms. Moore hoped that this investigation would help students understand that objects with a density less than water will float, and objects with a density greater than water will sink.

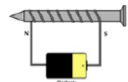
| | Mass | Volume | Density |
|----------------|-------------|--------------|-----------|
| Water | 20,000.00 g | 20,000.00 mL | 1.00 g/mL |
| Ping-Pong Ball | 2.70 g | 33.51 mL | 0.08 g/mL |
| Golf Ball | 45.93 g | 40.49 mL | 1.13 g/mL |
| Bowling Ball | 4,989.53 g | 5,454.52 mL | 0.92 g/mL |

Using the density calculated from the students' measurements, answer the question: What will happen if the bowling ball is placed in water?

Designing Rich Argumentation Tasks (argumentationtoolkit.org) - Argumentation Lessons

Lesson #1

Ms. Salazar's students are analyzing the data table from an investigation they conducted that answered the question: Which type of electromagnet is the strongest? The students created electromagnets by wrapping a wire around a nail and connecting the ends of the wire to a battery. This generated an electric current and turned the nail into a magnet, called an electromagnet (see image below).



The students varied the number of times the wire was wrapped around the nail and the material the nail was made of to see how this affected the strength of the electromagnet. They measured the strength of the electromagnet by counting how many paperclips it could pick up. The table below shows the students' experimental results.

| Number of Times Wire Wrapped Around Nail | Nail Material | # Paperclips Picked Up |
|--|---------------|------------------------|
| 10 | Iron | 5 |
| 25 | Iron | 20 |
| 10 | Aluminum | 2 |
| 25 | Aluminum | 5 |

After analyzing the data table, Ms. Salazar had students engage in a whole class debate about which type of electromagnet is strongest.

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4. Activity: Redesign of Argumentation Task

The Task:

- Either individually, or in pairs, redesign the argumentation task in Lesson #1 or Lesson #2 from the previous activity in terms of one of the key design criteria.
- This redesign might include restructuring the task completely and/or changing the data that students are using.

Share out:

- Who would like to share their revisions? Make sure to articulate how these revisions attend to the criteria you selected.

Designing Rich Argumentation Tasks (argumentationkit.org) - Argumentation Lessons

Lesson #2

In the middle of a unit on density, Ms. Moore had her students conduct an investigation to determine whether different types of balls would sink or float in water. Below is a table the students created after collecting data about the mass and volume of water, a ping-pong ball, a golf ball and a bowling ball. The students then calculated the density of each object by dividing the mass by the volume. Ms. Moore hoped that this investigation would help students understand that objects with a density less than water will float, and objects with a density greater than water will sink.

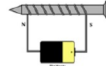
| | Mass | Volume | Density |
|----------------|-------------|--------------|-----------|
| Water | 20,000.00 g | 20,000.00 mL | 1.00 g/mL |
| Ping-Pong Ball | 2.70 g | 23.51 mL | 0.08 g/mL |
| Golf Ball | 47.85 g | 40.49 mL | 1.18 g/mL |
| Bowling Ball | 4,989.52 g | 5,454.52 mL | 0.92 g/mL |

Using the density calculated from the arguments answering the question: 3

Designing Rich Argumentation Tasks (argumentationkit.org) - Argumentation Lessons

Lesson #1

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The students varied the number of times the wire was wrapped around the nail and the material the nail was made of to see how this affected the strength of the electromagnet. They measured the strength of the electromagnet by counting how many paperclips it could pick up. The table below shows the students' experiment:

| Number of Times Wire Wrapped Around Nail |
|--|
| 10 |
| 20 |
| 30 |
| 40 |
| 50 |

After analyzing the data table, Ms. Salazar asked the students to write an argument answering the question: Which type of electromagnet is the strongest?

Designing Rich Argumentation Tasks (argumentationkit.org)

Rich argumentation tasks encompass the following four criteria:

| Design Criteria #1: | Design Criteria #2: | Design Criteria #3: | Design Criteria #4: |
|--|---|---|--|
| Include a clear guiding question | Include multiple potential claims | Document the use of evidence | Encourage student-driven argumentation |
| • Written so that students do not interpret it in many different ways | • There needs to be evidence to support each claim – not just evidence for only one claim | • The evidence might be first hand (measurements or observations that students have collected), or second hand data (e.g. tables, figures, charts that they are given to analyze and use) | • Students, not the teacher, should be leading and carrying out the argumentation task |
| • The question should allow for there to be multiple ways to answer it (i.e. multiple possible claims) | • These claims might ultimately be convergent (i.e. meant to come together) or divergent (i.e. competing) | | |

Other things to consider when designing rich argumentation tasks:

- What argumentation element(s) do you want to emphasize in the lesson? These could include evidence, reasoning, student interactions, and competing claims.
- What are the needs of your students (e.g. English language learners, struggling with reasoning)?
- When are the opportunities in existing curriculum for having students engage in argumentation?
- What kind of evidence is available, and how can it be made accessible to students (e.g. students are studying the solar system and you need to simplify a NASA document)?
- How do you want students to engage in an argumentation task (i.e. writing, speaking, reading)?
- What types of supports might your students need to engage in an argumentation task (e.g. sentence starters, graphic organizers)?

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Criteria for Rich Argumentation Tasks

Example Redesign

This is an example of how Lesson #1 could be redesigned to better engage students in argumentation.

For example, there are not multiple potential claims for this lesson's guiding question given that particular data set (Design Criteria #2). Instead:

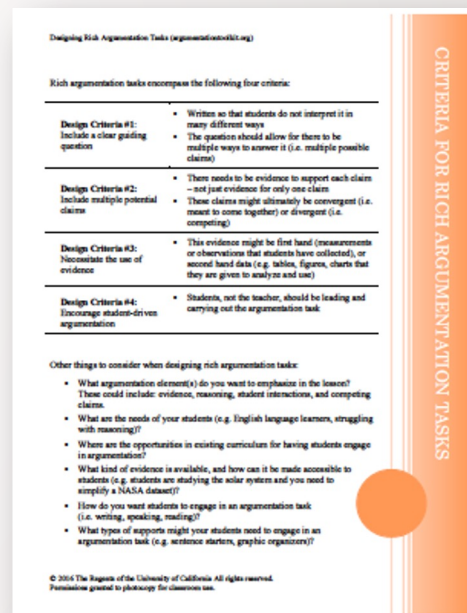
- Give students materials (e.g. batteries, nails of different materials, wire of different materials, electric tape, and paper clips) and task them with constructing the strongest electromagnet (i.e. able to pick up the most paper clips).
- Encourage students to consider design features such as wire material, nail material, number of wire turns around the nail, number of batteries, and arrangement of batteries.
- Afterwards, have students engage in argumentation around the question – *Which design features result in the strongest electromagnet?*

Extension: *Analyze an argumentation task within a lesson!*

Pick a lesson from existing curriculum that includes an argumentation task and analyze it with respect to the four key criteria previously discussed (similar to how you did during the Lesson Redesign Activity).

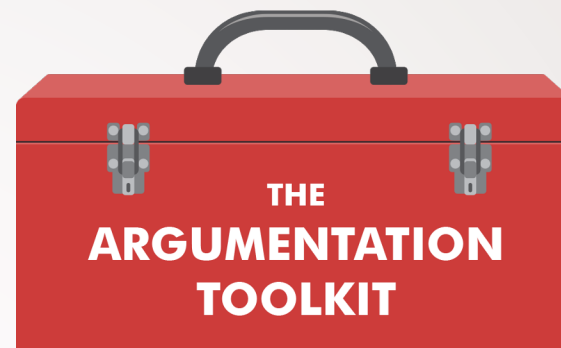
You might find it helpful to use the Criteria for Rich Argumentation Tasks handout.

For the next meeting, bring the lesson you analyzed, along with notes of this evaluation.





The Learning Design Group



PARTNERS AND RECOGNITION



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