Responsive Mini-Lessons: Claims—Somewhat Descriptive

About Responsive Mini-Lessons

Responsive Mini-Lessons (RMLs) provide short, targeted lessons that are responsive to each class's facility with oral argumentation, as assessed with the DiALoG Tool. The DiALoG Tool has eight components. Four are intrapersonal—claims, evidence, reasoning, and relevance; four are interpersonal—listening, co-constructing, critiquing, and regulation. RMLs are aimed at providing more practice with one of the eight components of the DiALoG Tool, so your students are more able to work together to enact rich, thoughtful, and engaging oral argumentation. For each component, the following phrases can be assigned, via the DiALoG Tool, to describe your students' abilities: Not Descriptive, Somewhat Descriptive, or Very Descriptive. An assigned phrase of Not Descriptive or Somewhat Descriptive indicates that your students likely need more support with that particular component of oral argumentation; a lesson is then suggested to help your students strengthen their abilities in that area. If the Not Descriptive phrase is assigned, the lesson provides basic, introductory support; if the Somewhat Descriptive phrase is assigned, the lesson assumes some basic facility with that component and provides an opportunity to practice it with more focus.

For the Claims RMLs, the Not Descriptive lesson provides an introduction to claims as tentative answers to questions about the natural world that need to be supported by evidence. Claims are provided to students, and students consider how well different claims are supported by evidence. The Somewhat Descriptive lesson builds on this by having students practice generating their own claims after they are given evidence about a rock mystery.

Does a Responsive Mini-Lesson for the Somewhat Descriptive Level Make Sense for Your Class?

The suggestion to provide a Responsive Mini-Lesson for the Somewhat Descriptive level indicates that, based on your use of the DiALoG Tool, the following statement best describes your students' use of claims during oral argumentation: *Students sometimes offer claims (tentative answers) to address questions under discussion*. For more detail about this level and how it compares to other levels, please see the DiALoG Tool User Guide.

There is one Responsive Mini-Lesson provided for the Somewhat Descriptive level.

Goal

- Provide students with an opportunity to make, and hear others make, claims about a set of provided evidence so they are more aware of what claims are and how different people can make unique claims by using the same evidence.

Responsive Mini-Lesson

Materials and Teaching Considerations

For the class

- Projection: Scientific Argument Diagram
- Projection: Introducing the Sliding Rocks Mystery: Sliding Rock 1
- Projection: Sliding Rock 2
- Projection: Sliding Rock 3
- Projection: Question: Sliding Rocks Mystery
- Projection: Possible Claims: Sliding Rocks Mystery
- Copymaster: Sliding Rocks Mystery: Part 1
- Copymaster: Sliding Rocks Mystery: Part 2
- Copymaster: Sliding Rocks Mystery: Part 3

For each pair of students

- 1 copy of Sliding Rocks Mystery: Part 1
- 1 copy of Sliding Rocks Mystery: Part 2
- 1 copy of Sliding Rocks Mystery: Part 3

Time frame: 30 minutes

Teaching Considerations

Most lessons will begin with an introduction followed by what is designated as the lesson itself. The introduction is conceived of as a brief activity that sets up and supports the lesson that follows. Each introduction is teacher-led, while the lesson that follows is more student-centered.

Getting Ready

1. **Decide how to present the resources for this lesson.** During the introduction, you will present Scientific Argument Diagram, Introducing the Sliding Rocks Mystery: Sliding Rock 1, Sliding Rock 2, Sliding Rock 3, Question: Sliding Rocks Mystery, and Possible Claims: Sliding Rocks Mystery. The lesson is written as if these resources will be projected.
    - Alternatively, you can choose to make enough copies so each pair or small group of students receives one copy of each.
    - If you do not have a color printer, you can make black-and-white copies for students and project the color versions so students can more clearly see the rocks and the trails that are made behind the rocks.
2. **Make copies of student sheets and decide how you will distribute them during the lesson.** Students are responsible for completing three separate student sheets during the lesson: Sliding Rocks Mystery: Part 1, Sliding Rocks Mystery: Part 2, Sliding Rocks Mystery: Part 3.
    - Make enough copies of each student sheet so each pair of students gets one copy of each.
    - You may choose to distribute all three sheets at once, explaining to students that they should complete them in order. Alternatively, you may ask students to come up and get a new sheet from you each time they complete the preceding student sheet.
3. **On the board, write the following phrases:**
    - I think the best claim to make based on the evidence is . . . .
    - This supports the claim because . . . .

Responsive Mini-Lesson

Introduction

1. **Project the Scientific Argument diagram and discuss claims as part of argumentation.** Review with students that an argument begins with a question, and the question is directly addressed with a claim. Remind students that as the diagram shows, the claim is then further supported by a combination of evidence and reasoning. Say, **"Today, you will practice making claims and hearing the claims that your classmates make. Today's activities will give you an opportunity to see that the same set of evidence can be interpreted differently and, therefore, different claims can be made from the same evidence. In addition, you will see that as you discuss evidence with your classmates, your ideas may shift. You can learn a lot through discussion. Your ideas about the claims and evidence will change and evolve based on discussion. This is why discussion—whether in person or through writing—is such a vital practice of science."**
2. **Explain that in science, claims need to be supported by evidence.** Explain that in science, claims are statements that students can make about the natural world, and these claims need to be supported by evidence.
3. **Project Introducing the Sliding Rocks Mystery: Sliding Rock 1.** Say, **"Several years ago, scientists discovered something mysterious. While working in Death Valley, a desert in California, scientists came across large rocks that looked like this one. The rocks were sitting still, with trails behind them. The trails showed that the rocks had moved, sometimes great distances. Yet no one knew how this had happened!"**
4. **Project Sliding Rock 2 and Sliding Rock 3.** Say, **"These photograph show other rocks that were observed in Death Valley that same year."**
5. **Project Question: Sliding Rocks Mystery.** Read the question aloud and explain that this is the question that students will be thinking about and making claims about today.

Lesson

1. **Project Sliding Rock 2 again and introduce the activity.** Explain that each pair of students will get three student sheets that will guide their analysis and participation in the activity. Explain how students will access each student sheet (either completing each one in order after you distribute them, or coming up to get a new sheet from you after completing each one). Hold up each student sheet as you explain its purpose.
    - **Sliding Rocks Mystery: Part 1.** Students will make observations of the rocks in Death Valley and the trails scientists found behind those rocks, using both the photograph on their student sheet and the projection (Sliding Rock 2).
    - **Sliding Rocks Mystery: Part 2.** Students will read and discuss the evidence about the rocks and the area in which they were found. Students will make annotations as they work.
    - **Sliding Rocks Mystery: Part 3.** After completing Parts 1 and 2, students will make claims to answer the question *What is causing these rocks to move?* Students should make and record at least two or three claims, but they can make and record more, if they like.

Responsive Mini-Lesson

2. **Introduce discussion prompts.** Direct students' attention to the discussion prompts about claims that you wrote on the board. Encourage students to use these as needed.
3. **Distribute Sliding Rocks Mystery student sheets.** Distribute one copy of each of three student sheets or one copy of the first student sheet (depending on what you decided) to each pair of students.
4. **Students begin activity.** Circulate and support students as needed.
5. **Project Possible Claims: Sliding Rocks Mystery and conduct a whole-class discussion.** Explain that these claims were some that were made based on the evidence that students saw. Many students' claims will likely align with these claims or will be variations of these claims. Ask students to share any claims that are different from these and record them on the board.
6. **Discuss claims and evidence.** Ask students to consider which claim they think is strongest, based on the evidence that is available to them. Have students share their thinking with the class.
7. **Discuss scientists' current thinking about the Sliding Rocks Mystery.** Explain that scientists actually don't know the final answer to this mystery! They are still collecting evidence and making observations to answer their questions. Right now, the preferred answer is that the wind slowly moves these rocks across the land and that this happens during the muddy season when it is easier for the rocks to slide and make trails. However, scientists are not completely sure that this is the final answer. They continue to work together to collect evidence and become more sure of their ideas.
8. **Summarize important ideas.** Ask students to share their general thinking about what the relationship between claims and evidence is and why the same evidence can cause different people to support different claims. Review specific examples of claims made by different students during the activity to directly support the following points:
    - Claims answer a question about the natural world and are an invaluable part of making arguments and participating in the scientific practice of argumentation.
    - Claims can change and evolve based on discussions you have about the evidence or when new evidence is presented.
    - The same evidence can cause different people to support claims or come up with different claims.
    - In science, claims are based on facts rather than on opinions.

Why This Mini-Lesson Matters

This mini-lesson supports students in engaging in and reflecting on the dynamic and collaborative nature of developing claims in science. Science is often perceived to be an uncontroversial process of collecting objective facts (Driver, Newton, and Osborne 2000). However, in practice, science is not about right answers but about about making the best supported claim, given all the available evidence. To help students develop a deep understanding of the discipline of science and the practice of argumentation, this mini-lesson introduces them to the idea that multiple claims can be developed from the same set of evidence depending on how you interpret and reason around the evidence. Engaging in the development and selection of claims helps students with a core disciplinary idea—science ideas are developed within a community as scientists make, challenge, and revise competing claims with one another based on evidence. Through this group argumentation process, scientists strengthen their ideas. While over time, ideas may have so much evidence to support them that they can seem indisputable, they remain open to challenge should new evidence become available that contests existing claims.

Resources

Driver, R., Newton, P., and Osborne, J. (2000). Establishing the norms of scientific argumentation in classrooms. *Science Education* 84(3): 287–312.

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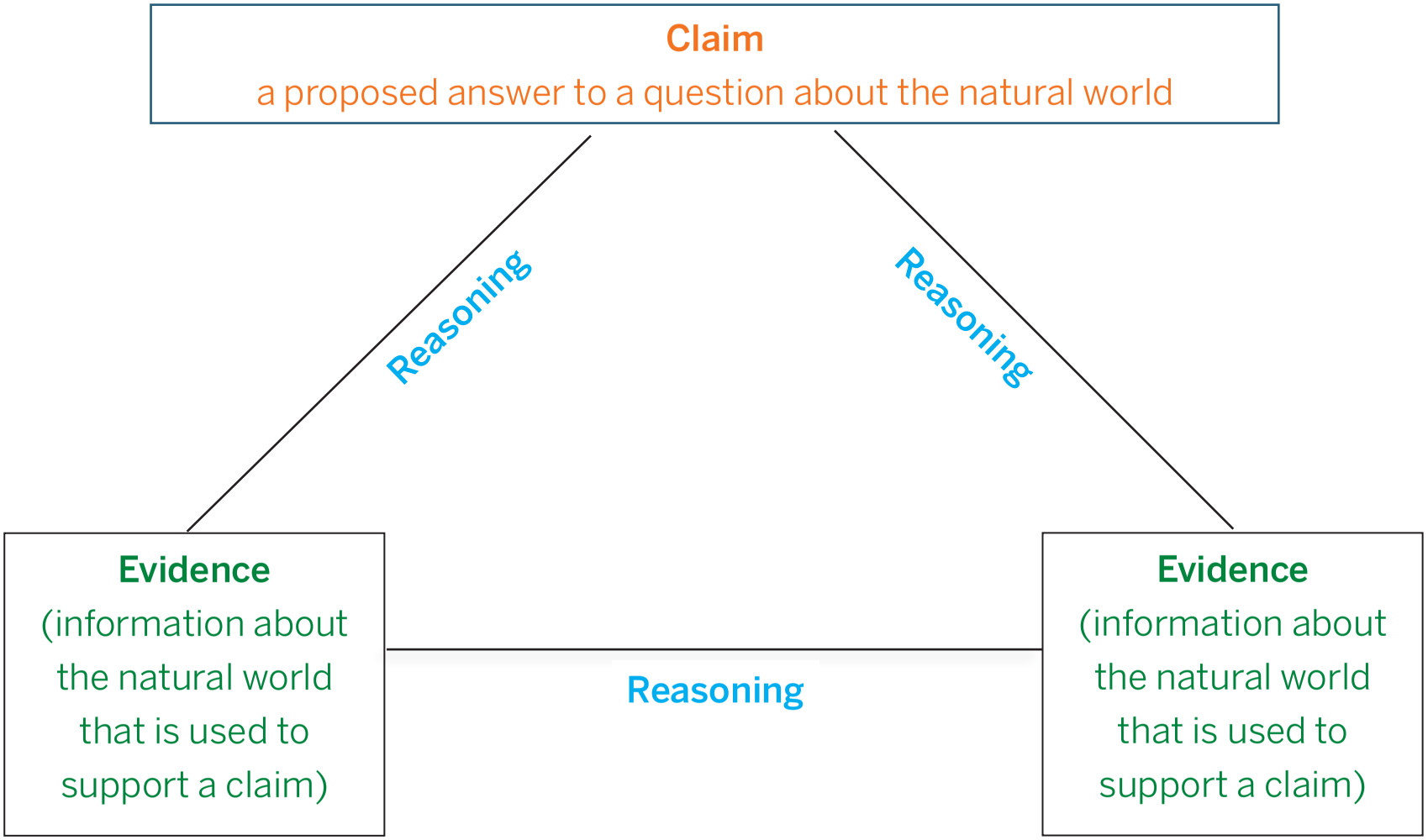
Scientific Argument

Question about the natural world



Introducing the Sliding Rocks Mystery: Sliding Rock 1

Sliding Rock 2

Sliding Rock 3

Question: Sliding Rocks Mystery

Question: What is causing these rocks to move?

Sliding Rock 2

Possible Claims: Sliding Rocks Mystery

Claim 1: Animals moved the rocks.

Claim 2: Humans moved the rocks.

Claim 3: Wind moved the rocks.

Claim 4: Water moved the rocks.

Names: _____ Date: _____

Sliding Rocks Mystery: Part 1

1. With your partner, make observations of the rock being projected as well as the area surrounding the rock.
2. Also make observations of the rock in the photograph below as well as the area surrounding the rock.

Observations:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Names: _____ Date: _____

Sliding Rocks Mystery: Part 2

1. With your partner, discuss the evidence that has been collected about the area where the sliding rocks were found.
2. Make annotations about your ideas.

Evidence:

- This area is almost perfectly flat.

- This area is dry—almost no rain falls here. However, for a few days during some times of the year, there is a lot of rain.

- There are some strong winds here but not all the time.

- These rocks often weigh several hundred pounds.

- This area does not get a lot of human visitors.

- Although it is very hot and dry, many animals live in Death Valley. The largest ones are vultures, snakes, and rabbits.

Names: _____ Date: _____

Sliding Rocks Mystery: Part 3

1. Based on your observations and the evidence you read, work with your partner to make at least two or three claims to answer the question below.
2. Record your claims.

Question: What is causing these rocks to move?

Claims:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____