Responsive Mini-Lessons: Claims—Not 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 Not Descriptive Level Make Sense for Your Class?

The suggestion to provide a Responsive Mini-Lesson for the Not Descriptive level indicates that, based on your use of the DiALoG Tool, the following statement best describes your students' use of evidence during oral argumentation: *Students do not 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 Not Descriptive level.

Goal

- Provide students with an opportunity to think about what a claim is; how claims are related to evidence; and how different people can think differently about evidence and, therefore, make different claims.

Responsive Mini-Lesson

Materials and Teaching Considerations

For the class

- Projection: Scientific Argument Diagram
- Projection: Florida Manatee
- Projection: Manatee Mystery
- Projection: Manatee Mystery with Evidence
- Projection: Possible Claims: Manatees
- Projection: Problem Scenario Directions
- Copymaster: Problem Scenario 1
- Copymaster: Problem Scenario 2

For each student

- 1 copy of Problem Scenario 1
- 1 copy of Problem Scenario 2

Time frame: 30 minutes

Teaching Considerations

Most lessons will begin with an introduction followed by the lesson itself. The introduction is 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, Florida Manatee, Manatee Mystery, Manatee Mystery with Evidence, and Possible Claims: Manatees. Later, you will also present the Problem Scenario Directions for the activity that students will work on independently. The lesson is written as if these resources will be projected.
    - Alternatively, you can choose to make enough copies of all projections so each pair of students receives one copy of each.
2. **Make copies of Problem Scenario 1 and Problem Scenario 2.** Make enough copies so each student gets one copy of each scenario.
3. **On the board, write the following phrases:**
    - This claim is better because . . . .
    - The evidence supports this claim because . . . .

Introduction

1. **Project 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. Explain that as the diagram shows, the claim is then further supported by a combination of evidence and reasoning. Say, **"Today you will focus on understanding what a claim is and how the same question can be answered with different claims, depending on the evidence that is offered and how that evidence is interpreted. Different people can make different claims about the same evidence, based on how they interpret the evidence."**

Responsive Mini-Lesson

2. **Explain the role of claims as tentative answers in the overall process of the scientific endeavor.** Explain that when scientists are trying to figure out an answer to a question about the natural world, they collect evidence and make claims based on that evidence. Their original claims are often just tentative answers to the question they are addressing, and different scientists may have different claims based on the evidence they have. As they collect more and more evidence, their claims may shift and change. New claims can emerge, and new claims are extremely helpful because they help the scientists working on the problem to think about that problem in new ways. Eventually, as more evidence emerges, scientists become more and more sure of their claims.
3. **Project and introduce the Florida Manatee.** Explain that as a class, you would like to illustrate this thinking about claims with an example of a real mystery to scientists about something that happened in Florida. The mystery revolved around this organism—the Florida manatee. Explain that the manatee is an herbivore that lives in the ocean water near Florida. Manatees are large, slow animals that can often be found in small groups. They live close to the shores, aren't known to swim into the deep ocean, but they do normally move from one feeding ground to the next.
4. **Project and discuss Manatee Mystery.** Explain that during one especially cold winter in Florida, scientists found this large group of manatees huddled together in one area for a long time. Normally, the manatees were not found staying in this particular area, especially in such a large group. Introduce the question that scientists were asking at the time. Ask, **"Why are so many manatees staying in the same area right now?"**
5. **Project Manatee Mystery with Evidence.** Read aloud the question again, along with the evidence that is provided.
6. **Ask students to make initial, tentative claims.** Ask students to quickly discuss with a partner and then share a few initial claims they have, based on the evidence provided. Write student claims on the board.
7. **Project Possible Claims: Manatees.** Let students know that these are two claims scientists made at the time, based on the evidence they had as well as on their own understanding of manatee behavior.
8. **Discuss claims.** Pose the question, **"Which claim is best, based on the evidence provided, and why?"** Discuss all possible claims, including the ones that students provided.

Lesson

1. **Introduce the activity.** Explain that students are now going to consider two other mysteries with evidence and possible claims. They will start with a real mystery about cane toads, an organism that was introduced to Australia about 100 years ago. As time allows, students will also work on a diagnostic mystery about a girl who may or may not have poison oak.
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.

Responsive Mini-Lesson

3. **Project Problem Scenario Directions.** Review the directions with students, explaining any aspects that are unclear. Assign partners, or have students choose partners. Remind students that each pair will need to work with another pair during Step 4. Assign those groupings or let students choose.
4. **Distribute Problem Scenario 1 student sheets.** Distribute one copy to each student and remind students to begin reading and annotating independently.
5. **Students read and annotate.** Circulate and offer support as needed.
6. **Pairs discuss claims and evidence for Problem Scenario 1.** Remind students to share evidence along with their claims. Let them know that they can consult their annotations as they discuss, and they can change their minds about the claims they originally chose. As needed, provide time for students to add annotations in response to what they hear during the discussion.
7. **Pairs join with another pair to discuss.** Remind students to discuss the claim(s) they chose and to also explain why they chose their claims, based on evidence.
8. **Distribute Problem Scenario 2 student sheets.** Distribute one copy to each student.
9. **Students read and annotate.** Remind students to follow the same procedures as they did with Scenario 1. Circulate and offer support as needed.
10. **Debrief as a class.** Ask students to discuss which claim for each scenario they supported and why. Be sure to draw out the following points:
    - Different people can interpret the evidence in different ways, causing different claims to be seen as being more strongly supported.
    - Discussion helps people in a group clarify meaning and sometimes come to the same conclusion (about a claim) after discussion.
    - When there is doubt, more evidence is needed to make one claim stand out as the best.
    - Students can make new claims if the claims that are available aren't satisfactory.
11. **Summarize important ideas.** Ask students to reflect on the role of claims in argumentation. Be sure to summarize the following points:
    - Claims answer a question about the natural world.
    - Claims are supported by evidence (and reasoning).
    - The same evidence can cause different people to support or come up with different claims.

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.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

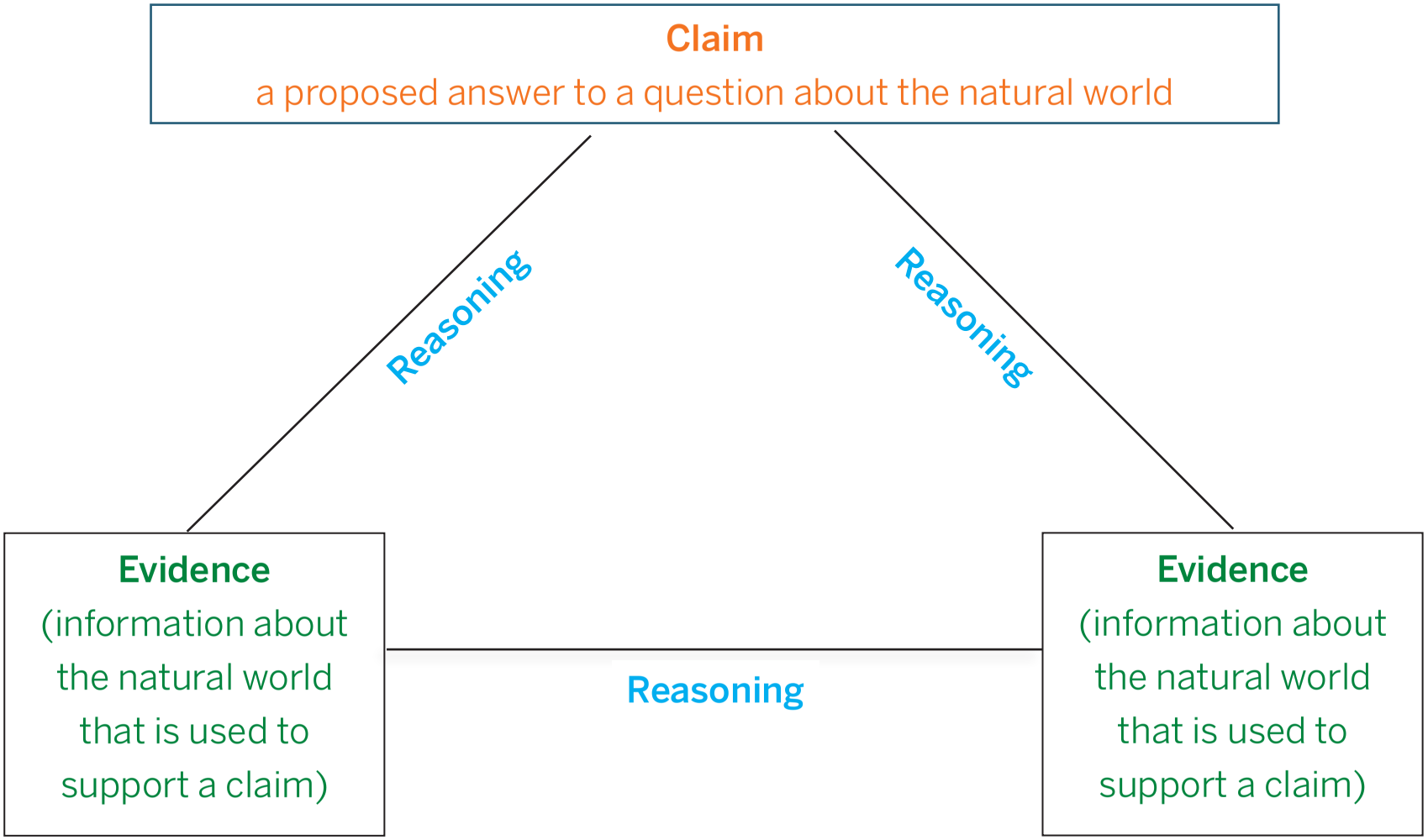
The Learning Design Group

ARIZONA STATE UNIVERSITY

These materials are based upon work supported by the National Science Foundation (award numbers 1621441 and 1621496).

Scientific Argument

Question about the natural world



Florida Manatee

Manatee Mystery

Manatee Mystery with Evidence

Question: Why are so many manatees staying in the same area right now?

Evidence:

- Manatees need warm water to survive.
- There is a large pipe near where all the manatees are staying. The pipe comes from a factory that pumps clean, warm water into the surrounding water.
- At the time the scientists made these observations, it was an especially cold winter.
- Manatees are social and are often found near one another in groups. The group in this area is an especially large group.

Possible Claims: Manatees

Claim 1: The manatees are in this area because the water is so warm.

Claim 2: The manatees are in this area because they like to stay together in a group.

Problem Scenario Directions

1. Begin with Problem Scenario 1 (Cane Toads).
2. Each student in a pair will independently read and annotate their own Problem Scenario student sheet.
   - Each student will also independently choose the claim they think is best, based on the evidence, by checking the box in front of that claim.
   - You can also write your own claim and choose it instead.
3. Next, partners will come back together and share which claim they chose.
   - As you explain the claim you chose, also explain why you chose this claim, based on the evidence.
   - Partners do not have to choose the same claim.
4. Partners will then join with another pair and discuss the claim(s) they chose.
   - Make sure to also explain why you chose your claim, based on evidence.
5. Follow the same procedure for Problem Scenario 2 (Poison Oak).

Names: _____ Date: _____

Problem Scenario 1

Question: Are cane toads affecting the population sizes of other animals that live near them in Australia?

Cane toads were introduced to Australia in the 1930s. They had never lived there before. In the time after they arrived, many other populations of animals that lived in Australia changed.

Evidence:

- Populations of crocodiles that lived in Australia near where the cane toads lived got larger.
- Populations of beetles that lived near where the cane toads lived got much smaller.
- Cane toads only eat small insects such as beetles.
- Populations of small snakes and lizards that lived near where the cane toads lived got smaller.
- Small snakes and lizards in Australia eat beetles, just like the cane toads do. Small snakes and lizards also eat crocodiles eggs.
- The size of most bird populations have stayed the same since the cane toads came to Australia.

Possible claims about the evidence:

☐ Claim 1: Cane toads are changing the population sizes of other animals that live in Australia.

☐ Claim 2: Cane toads are not changing the population sizes of other animals that live in Australia.

☐ Claim 3: Cane toads are changing the population sizes of some of the other animals that live in Australia.

☐ Claim 4: Add your own claim:

Names: _____ Date: _____

Problem Scenario 2

Question: Does the patient have poison oak or some other skin problem?

Teresa, a 10-year-old girl, went to the doctor because she had red, itchy, bumpy skin on both her arms. Her doctor wanted to give her the correct medicine to fix her skin problem. The doctor explained to Teresa that poison oak is a skin problem that can happen if you touch a plant called poison oak. The doctor asked Teresa if she had been anywhere near this kind of plant. Here is the evidence that Teresa's doctor collected:

Evidence:

- Teresa had been playing with her friends in a park a few days before, and they had a sleepover afterward. There was poison oak in the park, but Teresa said she didn't go near the part of the park where poison oak was found. However, some of her friends did.
- The oil from the poison oak plant that causes people to itch can rub off onto clothes and stay on those clothes until they are washed.
- Teresa had been camping before with her family, and she was the only person in her family who did not get poison oak.
- Some people do not get poison oak even when they touch the plant or the oil from the plant.
- Poison oak causes skin to become itchy and red, with bumps all over it.

Possible claims about the evidence:

☐ Claim 1: Teresa has poison oak.

☐ Claim 2: Teresa has a different skin problem.

☐ Claim 3: Add your own claim: