Case Analysis Protocol

The protocol and cases were written collaboratively by members of the Science 20/20 team.

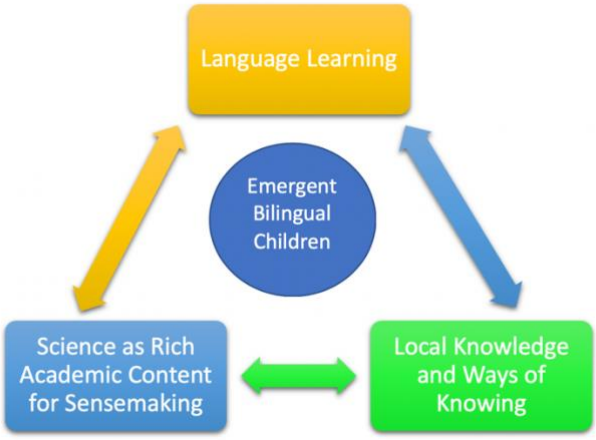
Description: Each case represents the lived experiences of those connected to the project as researchers, teachers, students, and student teachers. They are real, but names and minor details have been changed so as not to completely identify those involved. We do not intend for these cases to be black and white, right or wrong. Instead, each case illuminates areas of strength and potential and allow for self-reflection. They may ask us to articulate and question our own biases, assumptions, and taken-for-granted practices. Cases such as these are intended to surface tensions. Having group norms and protocols in place before engaging in case analysis is important for the success of the protocol. In discussing the case, we encourage you to think through the complexity of each case, seek to understand, imagine what else might be true, and exercise asset orientations.

Protocol: **Part 1.** Familiarize yourself with the Science 20/20 Framework before reading the case.

Science 20/20 Framework

Guiding Principles

1. *View **students as capable partners** in knowledge building.*
2. *Invite **productive participation** in science practices and sensemaking.*
3. *Utilize caring **formative assessment** and seek to understand what students know.*



Part 2. Read the case thoroughly. Once everyone has had enough time to read the case thoroughly, summarize the main events in the case and identify the problem(s) posed by the case.

Part 3. Use the Science 20/20 Framework and Guiding Principles to facilitate an open discussion related to the case. Same questions and prompts might include:

1. *What scientific practices and literacy practices are present in the case?*
2. *How has the teacher(s) and how might the teacher(s) invite students to draw on their funds of knowledge and local knowledge?*
3. *Where do you see evidence of students positioned as knowers, productive participation, and/or formative assessment?*
    1. *What are the opportunities to position students as knowers, invite productive participation, and incorporate formative assessment?*
4. *What else might be true?*

Part 4. Connect back to your context. Reflect. How might this case and the discussion of the case inform your work?

A Case of the Monarch Butterflies

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Keywords/phrases
scientific practices
vocabulary
students as knowers
productive participation

Mrs. Birde picked up caterpillars for her science unit on Monarch Butterflies. On the first day of the lesson, she brought in a butterfly garden to her classroom. To start the unit, she had her students go to the classroom carpet to have a class meeting. She started her class discussion by saying: "Guess what boys and girls? Today, we start our science unit on Monarch Butterflies! Look at what we have here? We have caterpillars!"

The students are excited; Henry says, "I love butterflies! We learned about them in Mrs. Sampson's class last year!" Mrs. Birde replies, "That's wonderful, Henry! You can be our resident expert!"

"To start our unit, I wanted to share some big scientist words with you." Mrs. Birde pulls out vocabulary flashcards with photographs on them. She holds up the first flashcard and says: "Our first vocabulary word is: *caterpillar*. Can you repeat and say caterpillar after me?" The class repeats in unison "caterpillar." Mrs. Birde asks, "Can anyone tell me what a caterpillar is?" A student says: "It's a baby worm." Mrs. Birde responds, "No, it's not a worm! It's the larvae or baby butterfly or moth. Friends, what is a caterpillar?" The class responds, "A baby butterfly!"

The lesson goes on and Mrs. Birde says, "The next scientist word is chrysalis. Everyone, say *chrysalis*." The students repeat, "chrysalis." Do you know what a chrysalis is?" Henry shouts out and says, "It's a pupa!" "Oh, that's my next word," Mrs. Birde responds, "a chrysalis is the hard, outer protective layer that protects the caterpillar. It is also called the pupa. What does the chrysalis do?" Lisbeth raises her hand and says, "It's hard." Mrs. Birde responds: "Yes, it's hard, it protects the caterpillar while it grows." The introduction of vocabulary words (metamorphosis, milkweed, and adult butterfly) continues to follow this pattern.

After the introduction of vocabulary, Henry says, "Oh gross! Look at its poop!" Mrs. Birde responds, with, "now, is that what a first grader does? Is that being on task?" Mrs. Birde redirects the class and begins to read a non-fiction text about the lifecycle of a butterfly to reinforce the concepts she presented from the vocabulary flashcards.

After reading the non-fiction text, Mrs. Birde proceeded to have students return to their desks to write about what they learned during read aloud,and label the life-cycle of a butterfly presented in the text. As students were at their desk writing and labeling, she called small groups of students back to the Butterfly Garden to make initial observations and ask questions. As small groups of students went to the back of the room to observe the caterpillars, Mrs. Birde asks students, "As you look at our butterfly garden, what do you notice?" As students shared what they noticed, she documented the observations on chart paper. Once students shared observations, Mrs. Birde asked if the students had any wonderings. Sample student responses are on the next page.

Some of the student observations that were captured

There are lots of leaves.	The caterpillar is black, yellow and white.	There are holes in the leaves.
The caterpillar is small.	The caterpillar is fat.	There are four caterpillars.
The caterpillar has stripes.	The caterpillar has something sticking out of its head.	There are two on each side.

Some of the student wonderings that were captured

Why do the caterpillars have stripes?	Why are there holes on the leaves?	Do caterpillars eat a lot?
Do they drink water?	Why are there two antennae on each side?	Is that caterpillar poop?

Note: We also find that many of our cases are complementary to and can be analyzed with the protocol and Equity Literacy Framework in Gorski and Pothini's text *Case Studies on Diversity and Social Justice Education* (2nd Ed., 2018). [http://www.edchange.org/cases/Case-Analysis-Model.pdf]