

Facilitator's Guidelines for 2nd Meeting

Unless otherwise noted, all materials are on the website in the Guidelines for Science-Writing Group Meetings section.

Preparing for the Meeting



Read:

- the following pages in Writing in Science: 81–84 (because), 28–34 (word banks), 34–43 (graphic organizers), 78–80 (Useful Words and Phrases in Scientific Writing)
- these facilitator's guidelines and the materials that follow



Refer to Facilitator's Notes: General Tips for Leading Productive Meetings as needed.



Copy materials for participants as needed:

- Participants' Guiding Questions for 2nd Meeting
- Because and I Think This Because section of the Student Notebook Entries: Pre-kindergarten Through Fifth Grade section on the website
- Background Information for Plants Video Episode on the website



Test the technology and the DVD to be sure that everything will work during the meeting.

Meeting Focus: Scientific thinking (because, I think this because); scientific observations

Meeting Overview



Teachers will reflect on how they think using because and I think this because has affected their students' scientific thinking.



Through looking at student notebook entries, participants will reflect on the effect of using because and I think this because on students' writing, and gain insights about meaningful critiquing of notebook entries.



Teachers will write a scientific observation, then revise it, if needed, by following a graphic organizer.



After watching a video episode, participants will discuss examples of modeling and scaffolding that the teacher implemented in order to help develop students' abilities to act, think, and write like scientists.



Finally, teachers will discuss upcoming lessons in which students could make and write scientific observations as well as draw scientific illustrations or diagrams.

1. Reflecting on Practice (about 20 minutes)

Section Overview: Participants will reflect on the use of because and I think this because in their instruction.

☐ Discuss the guiding questions.

☐ Note the importance of looking for, and talking about, anecdotal evidence of the effects of instruction. What have the teachers actually observed in students' actions or read in their science notebooks that makes them think that using the word and phrase has affected their students' learning?

1. Reflecting on Practice

Guiding Questions	Notes
1. How do you think using <i>because</i> and <i>I think this because</i> helped your students develop and express scientific thinking? Give examples. 2. How do you think using <i>because</i> and <i>I think this because</i> helped you develop and express your thinking in your own science notebook entries? 3. How often and to what extent did your students express their scientific thinking before you began modeling the use of this word and phrase?	

2. Critiquing Notebook Entries (about 30 minutes)

Section Overview: Participants will look at student work from their grade level, and above and/or below their grade level, and reflect on how using *because* and *I think this because* contributes scientific evidence and/or thinking to each entry. Afterward, participants will read notes about the entries and reflect on how their responses to the entries are similar to and different from the responses provided in the notes.

- ☐ Ask participants to read and discuss the first guiding question. After they have discussed the entry, share the following with them if no one has mentioned it:
 - The teacher provided a frame that is ineffective.
 - The observation—"I noticed the magnet sticks to the paper clips"—cannot also be the cause of the phenomenon or the reason that something happened—"paper clips are made of the right kind of metal."
 - An effective form of this frame would be: "I noticed the magnet sticks to the paper clips. I think this happens because paper clips are made of the right kind of metal [i.e., the kind that is attracted to magnets]."
 - In cases in which you want students to state their observation and then provide reasoning for why they think something happened, use a frame like this: "I noticed [or 'observed'] _____. I think this happened because [or 'I think this is because' or 'I think this means that'] _____."
- ☐ After discussing the first question, participants read the other guiding questions. Then they begin reading and discussing each notebook entry at their grade level (with a colleague or colleagues at their grade level, if possible) in the *Because* and *I Think This Because* section of the Student Notebook Entries: Pre-kindergarten Through Fifth Grade section on the website. Remind them to focus on only the Three Key Elements (science content, scientific thinking and skills) and to begin by noting the strengths of the entry.
 - ☐ After they have read each entry, they read the notes about that entry.
 - ☐ If there is time, they can read the entries above and/or below their grade level.
 - ☐ Finally, they discuss the second and third guiding questions.

2. Critiquing Notebook Entries

Guiding Questions	Notes
1. A teacher had students write an observation about paper clips and a magnet using a frame, which is underlined in the sample below. Is the frame effective or ineffective in scaffolding the student's thinking and writing? Explain your answer.  I noticed the magnet sticks to the paper clips because <u>paper clips are made of the right kind of metal.</u> 2. As you read each sample, discuss this question: How do you think using <i>because</i> and <i>I think because</i> in these entries helped students think and write like scientists? 3. After reading the notes about the entries, how were your first thoughts about the entries similar to and different from what you noticed after reading the notes?	

3. Writing a Notebook Entry: Scientific Observation (about 20 minutes)

Section Overview: Participants will conduct and write their own scientific observation of water in a transparent container. Then they will reconsider their observation and written entry as they use an organizer that their students also will use for scaffolding.

- ☐ Read the first guiding question together before the teachers begin their observations.
- ☐ When participants conduct their observations and write about what they observed, they should not talk with each other (see section noted with * that follows).
- ☐ Next, have them work in pairs and talk about what they are observing as they follow the Observations organizer (Figure 4–1 in Chapter 4 in Writing in Science).
- ☐ Then have them work alone again, either to revise the scientific observation they have written or write a new observation following the Observations organizer.
- ☐ Then discuss the guiding questions.
- ☐ Share the following with them sometime during the discussion:
 - The Observations organizer is generic and may need to be adapted to a particular investigation or unit of study.
 - *Students need to talk with each other when they are making observations. (Participants were not supposed to talk at first so that they would realize, if they did not know already, how important it is for students to share what they are observing.) This talking helps make their observations much richer because students notice different things.
 - Be careful with the “It reminds me of” section of the organizer. At the beginning of a unit, it might be appropriate for students to refer to something unscientific in their prior knowledge (e.g., “The soil reminds me of brownie mix because the soil is brown and powdery.”). However, later on in the unit, the words reminds me of should prompt students to make connections with earlier investigations (e.g., “The soil reminds me of humus because it has little bits of wood and dead plants like we observed earlier in a humus sample.”). Note the importance of including because so that the student provides her reasoning.
- As they plan their instruction, it is important for them to write what they are planning to have their students write. This practice helps teachers anticipate issues students will have and to differentiate the instruction to meet students’ different needs.

3. Writing a Notebook Entry: Scientific Observation

Guiding Questions	Notes
1. What do you think your students could find challenging about this task? 2. How do you think using this organizer would help your students make and write more detailed, accurate, thoughtful observations?	

4. Viewing and Discussing the Plants Video Episode (about 40 minutes)

Section Overview: Participants will watch and then discuss a video episode in which a teacher models how to make detailed, organized scientific observations and illustrations using a data table as an organizer.

- ☐ Before watching the video episode, read the guiding questions. Then discuss them after watching the episode.
- ☐ At some point during the discussion, note that the teacher adapted different aspects of the Observations organizer to her specific unit, transforming the data table into visual scaffolding for her students' observations of their plants.
- ☐ After the discussion, go over the Background Information for the Plants Video Episode.

4. Viewing and Discussing the Plants Video Episode

Guiding Questions	Notes
1. What modeling does the teacher do during these two sessions, first to teach observational skills and scientific thinking, and then to show students how to write scientific observations? 2. What scaffolding does she provide that students can use during the lessons and as they make entries in their own data table and write observations of their own plant? 3. How does she use the focus question—"What can we observe about the plant's growth and development over time?"—in both sessions? 4. How could the modeling and scaffolding help support students who are at very different places on an academic-skills continuum, especially in writing?	

5. Considering Next Steps (about 10 minutes)

Section Overview: Teachers will work together to plan lessons in which students will make and write scientific observations.

- ☐ If possible, have teachers who are teaching the same unit (or at least are familiar with the same unit) plan together.
- ☐ Discuss the guiding questions.
- ☐ Show them the sample minilesson for scientific observations in Chapter 11 in Writing in Science in Action so they can include that in their planning. They also can use some other minilessons in that chapter if they want to teach students how to make scientific illustrations and/or data tables.

5. Considering Next Steps

Guiding Questions	Notes
1. In which science lessons in the next few weeks will your students need to make and write scientific observations? 2. In what ways, if any, would you have to adapt the Observations organizer to support your students in these lessons? 3. In what ways could you use the following questions in your instruction to help students develop their scientific skills and thinking, especially in terms of distinguishing observations from inferences? ☐ What did you actually observe? ☐ What is your evidence? ☐ What did you observe that makes you think that?	

6. Preparing for the Next Meeting

1. In the weeks before the next meeting:

- ☐ Read about scientific observations, illustrations, diagrams, and data tables in Writing in Science on pages 45–66.
- ☐ Begin modeling how to make scientific observations, illustrations (or diagrams), data tables, and written observations.
- ☐ Continue making entries in your own science notebook as you plan instruction and, if needed, during investigations.

2. Confirm the date and time of the next meeting: _____.

3. Remember to bring the following to the next meeting:

- ☐ A pen and a marker (You will be writing a scientific comparison of the two objects.)
- ☐ Writing in Science
- ☐ Writing in Science in Action
- ☐ Teacher's guide for your science unit, or whatever instructional materials you use with your current science unit
- ☐ Your own science notebook