

Professional Development Situation: Training**Skill Focus: Modeling Science Practices****Time Required: 90 minutes**

USING SCIENCE PRACTICES

Participants will build a watershed to learn to engage youth with science investigations.

Agenda

Welcome—5 minutes

Introduction—15 minutes

See the Skill in Action—10 minutes

- [Using the Tools of a Scientist](#) video-based learning module

Hands-On Learning—40 minutes

- [Build a Watershed](#) activity from pbskids.org

Conclusion—20 minutes

Materials

- Computer with Internet connection
- Projector & speakers
- [Using the Tools of a Scientist](#) video-based learning module
- Flip chart paper and markers
- Pens for participants
- An image of the local region's watershed with visible rivers (google "Omaha watershed", for example)
- Materials for small landscape model (per pair of kids)
 - 1 tray (lunch tray, lid of a plastic storage container)
 - 2 tall containers (e.g., 12-oz. cups or soda bottles, coffee can, etc.)
 - 2 short containers (e.g., soup or soda can, 6-oz. paper cup, yogurt container, etc.)
 - 1 Sheet of clear or light-colored plastic (e.g., cut-open garbage, dry cleaner, or shopping bag)

- 1 spray bottle
- 2 bottles of food coloring
- cooking oil
- glitter, dried spices, cake sprinkles, pieces of confetti, or other small objects, towels for cleaning up spills

Before the Session

- **Read this training guide** to become familiar with the content and allow time to personalize the activities to best suit your presentation style. Watch all videos and read informational materials.
 - *Italics indicate text that can be read aloud to participants.*
- Send reminder email about the training. Determine if any participants require accommodations (sight; hearing; etc.).
 - *The next professional development opportunity to enhance our STEM skills will be on DATE at TIME at LOCATION. Our focus for this session will be “Modeling Science Practices.” Let me know if you require any accommodations to participate in the training. I am happy to answer any questions you have and look forward to seeing you at the workshop. I can be reached at CONTACT INFO.*
- Gather all materials needed for the training.
- Develop a list of possible questions participants might have during the training. Create potential responses to be explored through informal conversation. Review any key terms or ideas that may be unclear.
- On the day of the training, test the audio and video equipment.

Training Outline

Welcome (5 min)

- Greet participants as they arrive. Make sure everyone feels welcome and comfortable.
- Introduce yourself and the focus of the session: “Modeling Science Practices”.
- Ensure participants are aware of the locations of restrooms facilities, refreshments, etc.

Introduction (15 min)

- Ask participants to complete a table tent. Have them put their name on one side and one thing every scientist does as part of their daily work on the other.
 - *What do you think are important parts of the daily work of scientists?*
 - *Be as general as you can; we are going to try to apply these to youths’ learning.*
- Ask participants to share what they wrote and take notes.

See the Skill in Action (10 min)

- Cue up the [Using the Tools of a Scientist](#) video-based learning module.
 - *Let's take a few minutes and watch a staff person who is facilitating a STEM activity with youth. Watch how she emphasizes science practices.*
- Show the video.
 - *How does she help youth practice STEM?*
 - Answer: By encouraging observation
 - *How did youth respond to the activity?*
- Re-watch the video if necessary.
 - *Observation is one important science skill that can help youth focus on collecting data and explaining phenomena of interest. Are there other science practices fostered in this video?*

Hands-on Learning (40 min)

- *We are going to practice a science activity that you can use with youth. If you have a lot of experience with engineering activities, I want you to pause and think about what is different in this activity.*
- For the activity, participants will work in pairs to investigate questions they have about watersheds. The activity [as written](#) allows for a “large model” and a “small model”, but for this professional development opportunity, you will **only do the small model**.
- **Show a large image of the rivers of the area.** (Showing local rivers helps participants make connections to local places; this is important for building interest and connecting to prior knowledge.)
 - *What do you notice about the rivers?*
 - *Is there anything unusual about the river patterns?*
 - *What questions do you have about the rivers? What questions will your youth have?*
 - Write down these questions somewhere public so they can be viewed by all participants. Remind participants that pollution, flooding, and rainwater conservation are all issues related to watersheds; questions can pertain to these as well.
- Tell participants they will be given tools to model watershed behavior in order to answer questions they have about the watershed.
- Introduce the tools:
 - Plastic bag to model landscape
 - Cups and items of different heights to model different landforms
 - Food coloring

- A spray bottle to simulate rainfall
- Ask participants to take some time and design an investigation using their model to see if they can answer their question.
- Allow participants to work for 30 minutes on this activity.

Conclusion (20 min)

- Ask participants to share the results of their investigations with the room in a “science conference”. Ask prompting questions such as:
 - *What are the limitations of your study?*
 - *What would you do if you had another trial?*
 - *Did anything surprise you?*
- Encourage participants to look back at the list of science practices and ask them to make connections.
 - *What kinds of science practices did we do as part of our investigation today?*
 - *Who asked the research question?*
 - *Why is it important that youth get to ask and investigate their own questions?*
- Record the answers to these prompting questions on chart paper or your own notes.

After the Session

- From notes you took on the chart paper, compile a list of strategies for modeling science practices and allowing youth to investigate their own science questions. Share this in your follow-up email to participants.
- Within 2-3 weeks of the training, email participants.
 - *Thank you for your participation in the recent Click2Science training on “Modeling Science Practices”. I hope you found it useful. Attached are some strategies the group discussed during the training. Consider meeting with a co-worker, supervisor, or friend to share what you learned. I look forward to continuing our learning at the next session on SKILL/FOCUS on DATE at TIME at LOCATION. Please let me know if you have any questions. I can be reached at CONTACT INFO.*

Want to Earn Credit? Click2Science has teamed up with Better Kid Care to provide continuing education units. Check it out at: <http://www.click2sciencepd.org/web-lessons/about>