

SUGGESTIONS FOR FOLLOW-UP ACTIVITIES AND DISCUSSIONS

The session is not over! A critical phase of learning anything new is application, when the learner takes new knowledge and applies it. There is some application included in the session, but with all professional learning for instructors, the rubber meets the road (or trail) when the instructors apply what they've learned to their instruction, and when they keep thinking about it and discussing it with their peers. If you want your instructors to try out "new" activities/approaches, program leader support is crucial. Even if they're excited by new ideas, it's easy for instructors, especially veteran instructors, to keep doing what they have been successfully doing already, and not try out new activities/approaches. Below are a variety of follow-up activities and discussions to dig deeper into the topic, and help you facilitate thoughtful implementation.

- **Next Generation Science Standards in Outdoor Science Instruction.** Present a "mini-session" on the NGSS to your staff, using the optional section, "Next Generation Science Standards in Outdoor Science Instruction" on page 30, and the slides included at the end of the sessions' slides. You'll need at least 1 hour to do this well.
- **Staff brainstorm of what they and you can do to encourage incorporation of nature and practices of science into instruction.** After the session reflection, your staff will have already written ideas they have about implementation. You can tap into these, and other ideas through a brainstorm of what they plan to do, and how you can support them in doing it.
- **Discussing Implementation of *What Scientists Do*, and/or *Discovery Swap*.** Assign your staff to each try out *What Scientists Do* and/or *Discovery Swap* during your next student program, and to write in their journal about how it went. Then lead them in a discussion on the activity(ies) at the end of the program during a meeting. Here are some suggested questions to focus a reflection or discussion on:
 - » What impact did the activity have on your students' understanding of the nature and practices of science?
 - » What was successful about the activity?
 - » What might you do differently the next time you lead it and why?
- **Instructor Observations.** If you do observations of instructors, discuss how you might incorporate elements from this session into the observations.
- **Continuing a discussion.** If there was a topic that came up during discussion that you had to cut off, and your staff is interested, set aside time to continue the discussion.
- **Groups research misconceptions from UCMF website sheet.** Go to the

UCMP website (<http://undsci.berkeley.edu/teaching/misconceptions.php#d2>) and show how to navigate the misconceptions. Click on one of the misconceptions, and show the paragraph explaining why it is an inaccurate description of science. Distribute to each group a copy of the *Misinterpretations of the Scientific Process* handout, and tell them it contains explanations for each of the misconceptions about science. Ask one member of each group to read aloud what the website has to say about each of the statements they classified as accurate. Encourage groups to discuss these statements once again, incorporating the additional information. Show the “How Science Works” page (http://undsci.berkeley.edu/article/0_0_0/howscienceworks_01). Also found on the “Resource Library” page of the Understanding Science website is a link to “How Science Works—the flow chart.” Show how each of the circles on the flow chart leads to more pages addressing what scientists really do, as opposed to the commonly taught steps of the “scientific method.” Encourage them to explore the website later and tell them that part of their homework will be to examine the Understanding Science website.

- **Read selected sections from A Framework for K-12 Science Education.** Download a free PDF of the Framework document at: http://www.nap.edu/catalog.php?record_id=13165 Print out selected pages of the Framework and assign a reading. Then lead an open-ended discussion with staff about the topic you’ve chosen, and how they might bring it into your program’s curriculum and instruction. Where are there opportunities in your program to provide students with experiences in doing science? Note that the practices are not called “Science Practices,” but “Science and *Engineering* Practices.” You might choose to only discuss the science aspect of the practices, or include engineering as well. Below are some relevant sections to choose from.
 - Scientific and Engineering Practices (pages 41-53)
 - Practice #1: Asking Questions (pages 54-56)
 - Practice #6: Constructing Explanations and Designing Solutions (pages 67-71)
 - Practice #7: Engaging in Argument from Evidence (pages 71-74)