

Session 2: Nature and Practices of Science

Session Overview

This session is the second *Foundation* session. This session immerses participants in activities and discussions about what is science and how scientific knowledge is produced. Science is a way of knowing and attempting to explain phenomena and to understand the world around us. It's seen as a social enterprise that advances scientific understanding over time. Science is both a *body of knowledge* that represents current understanding of natural systems and a *process* through which that body of knowledge has been established and is being continually extended, refined, and revised. Participants will be challenged to consider a variety of questions, such as: Just what is encompassed by the nature and practice of science? Is there agreement as to what constitutes the "ideas about science" and what should be taught? Is science objective reality or socially constructed? What is the relationship between culture and science? How does understanding and reflecting on the nature of science influence our practice? How can we as scientists and educators help others, including students and the public, to have a better understanding of the nature of science and why might that be important?

Session Objectives

In this session, participants:

- . Discuss "what is science?" and the nature of science.
- . Discuss that evidence is collected, interpreted, and influenced by current scientific perspectives and understandings and by the society, culture, and even the scientists' personal subjectivity.
- . Discuss value and effect of a deeper understanding of, and reflection on, the nature and practices of science.

Session Activities at a Glance

Quick Write. Participants respond to two prompts about the reading assigned for homework.

Discussion: Homework. Participants share their observations and experiences from last week's homework.

Discussion: What is science? How does science work? Participants are introduced to the rationale for why it is worthwhile to learn about the nature of science, both for scientists and science educators and also why and how this can be communicated to the public. Participants reflect on and talk with a partner about "what is science," and share their ideas in whole group.

Activity: Mystery Tubes. Participants work in small groups to determine what the interior construction of a mystery tube looks like – without looking inside the tube. This activity sets up a discussion about what scientists do and how science works.

Activity: “How science works” Flow Chart. Participants review “How science works” flowcharts and relate it the activities they did in this session. They trace their steps on the charts, which portrays science inquiry as a dynamic process.

Activity: Sorting Statements. Participants work in groups to sort statements into accurate and inaccurate descriptions of science and the scientific process and discuss them in terms of what is science and how science works.

Research Discussion: Participants are read and discuss ideas from research on the nature and practices of science.

Science Briefs: Climate change & 6 Americas. We have chosen to focus on climate change for this session as an application of how the public’s perception of how science works can influence their view of science and scientific evidence.

Quick Write: Self-reflection. Participants reflect on and write about their ideas on science.

Homework. Reading and tasks due next week are assigned.