

HABITS ARE HARD TO BREAK

Performance Standard 13A/13B.G

Students will compare scientific habits of mind in scientific and non-scientific everyday settings accordingly:

- *Knowledge*: Understand the foundations of scientific habits of mind (scientific reasoning, insight, skill, creativity, intellectual honesty, tolerance of ambiguity, skepticism, persistence and openness to new ideas).
- *Application*: Compare how scientists and non-scientists apply scientific habits of mind in everyday settings.
- *Communication*: Explain the values and applications of the scientific habits of mind in real-world situations.

Procedures

1. ***In order to know and apply the accepted practices of science (13A) and the concepts that describe the interaction of science, technology and society (13B)***, students should experience sufficient opportunities to develop the following:
 - Review existing resources for establishing working definitions for scientific habits of mind.
 - Develop a workable interview or survey instrument for class use.
 - Identify applications of scientific concepts in career and technical knowledge and skills.
 - Summarize importance and value of scientific habits of mind in real world circumstances.
2. Have students review and discuss the assessment task and how the rubric will be used to evaluate their work.
3. Introduce activity by having students brainstorm ideas about how a scientist thinks. The purpose is to set the stage for the kinds of scientific thinking that are the classroom rules for the year. All ideas should be recorded. Ask students to distinguish and delete ideas which characterize what a scientist does. Use this initial listing to research scientific habits of mind, the nature of science and the accepted practices of science. Divide students into small groups to create working definitions for 1-2 “habits”. If research is found to add more “habits” than were originally suggested from class brainstorming activity, students can present their additional suggestions for class “adoption”. Each group will present its definition of its assigned habit(s). The class must work to refine and adopt the final definition to be used for class thinking and for the next activity.
4. Students should now develop a set of 5-8 questions that will be used by all students in a series of interviews of adults. The questions need to focus on how the habits of mind are important in their field, how these habits are used in their field, how did they learn or practice these habits, etc. as well as how science is applied in their fields. They could develop a checklist or chart which lists the “habits of mind” for the interview. Each student should be assigned to interview at least two adults (one in a specifically scientific field and one who is considered to be a non-scientific field). The responses from the interviews may be in the form of email communications, written notes from the adult or student notes from the interview. After a reasonable period for interviews (one-two weeks), students should compile their responses to evaluate the class selected “habits”. Students should be asked to summarize the value and importance of scientific habits of mind and their own “resolutions” for personal use of them.
5. This activity may be revisited periodically throughout the school year when setting the historic stage for scientific discoveries or technologic innovations in the life/physical/earth/space science contexts of the course.
6. Evaluate each student’s work using the Science Rubric as follows and add the scores to determine the performance level:
 - *Knowledge*: The foundation definitions for scientific habits of mind are explained effectively.
 - *Application*: The interview process provided thorough and accurate comparisons of applications of the scientific habits of mind.
 - *Communication*: The explanations of the values and applications of scientific habits in mind in real-world situations were thorough, logical and well-detailed.

Examples of Student Work not available

Time Requirements

- 1-2 class periods for brainstorming activity and development of interview questions; 1-2 weeks for interviews; 1-2 class periods for compilation and summarization of interviews; periodic review of scientific habits in direct context of scientific discoveries and technological innovations.

Resources

- Access to research resources
- Science Rubric