

Unit 5 The Philosophy of Science

Unit 5 Challenges and Opportunities for Learning

The philosophy of science builds upon epistemology, its closest subtopic (sometimes even seen as the same topic), but also incorporates aspects of metaphysics, ethics and political philosophy. For those teachers and students who are intrigued by science, this unit offers opportunities to go into very interesting problems such as cosmic string theory (an 11 dimensional universe). For those who are less inclined toward science, this unit offers a chance to look more closely at so-called *pseudo-sciences*, and entertain questions about the debate over evolution versus intelligent design.

Unit 5 Culminating Activity (assessment of learning)

The Unit 5 culminating activity—philosophy of science debates—is a framework around which students develop their knowledge and understanding of the philosophy of science. Use the ideas that follow to help your students begin working towards completion of their debate and/or news story.

Description of Culminating Activity

The Philosophy of Science unit leads up to two main debates, which can be conducted by the entire class or with the class divided into two groups. The first debate centres on alternative medicine. The second debate focuses on the role of non-scientists in controlling science funding. Although these two issues come out in discussion in Chapter 15, they are also set up in Chapters 13 and 14. See BLM 13.1 to help students prepare for and hold the debates.

Learning Goals

Students will learn various theories from the philosophy of science that can help them sort through current issues around pseudo-science (e.g., astrology).

They will also question whether laypeople can make decisions about science funding: can we trust the experts, or do we need public accountability?

Learning Skills

The development of learning skills and work habits is an integral part of a student's learning, (*Growing Success*, p. 10). Specifically, teaching and assessment of these learning skills—responsibility, collaboration, independent work, organization, self-regulation, and initiative—will enhance students' success in the culminating activity, entire course, and post-secondary life.

Use BLM E Learning Skills Tracking Sheet to track students' learning skills for this unit and for the culminating activity.

Prior Learning Needed

Have students do a little research into alternative medicine (e.g., acupuncture, homeopathy, aromatherapy, etc.), and how the National Research Council Canada administers research funds. Where do elected politicians or appointees from the public enter into the funding process?

Materials Needed for Culminating Activity

If you are dividing the class into two debating groups, consider having the group not debating record (video or audio) the other group's debate and transcribe or chart the main arguments that come out. What did the debaters miss as potential material or lines of argument for the debate? This will encourage students not debating to be active listeners instead of passive spectators. How they saw and scored the debate can come out afterwards, in a debriefing session.

Motivational Strategies for Engaging Students

Show a clip of students debating to ignite interest and serve as an exemplar. Look up the following video title on YouTube. The video shows a training session from the Ontario Student Debating Union, filmed at Upper Canada College (2010):

OSDU Debating Workshop [Part 1 of 8]

Accommodations

Since debates are verbal activities, the non-audio learner and those less proficient in the English language may be left out. Consider using time-outs (signal with hands making a T) or caucus sessions, where those who are less likely to speak up in the debate forum can feed into their team's discussions and play a valuable part. Track these students' activities, as well as recording those who speak in the debate, as fulfilling the collaboration and responsibility learning skills.

Note: Although intelligent design is also a topic that could be debated, there is the potential for some students to be put in the awkward position of defending their religious views. If this is the case, then it is recommended that this be used as a discussion topic rather than a debate so that students are not singled out to defend their religious beliefs.

Differentiated Instruction (alternative assessment opportunities)

For students who are not as interested in participating in either debate, there is the option of doing a news story. The news story—presented in writing, in digital format (film, recording) or through a dramatization—can be done independently or in a small group.

Assessment Criteria

See BLM 13.1 for the Unit 5 culminating activity assessment criteria.