**Sample Scientific Practices Learning Goals**

Students will be able to:

* Explain what it is to “do science” and how the idealized steps of the “scientific method” do not do an adequate job of explaining what it is to do science.
* Explain and demonstrate how science is a “way of knowing”
* Describe what a generalization is and what it takes to prove and to disprove a generalization or scientific theory.
* Describe a hypothesis, explain when it’s appropriate to use a hypothesis and how a hypothesis differs from a prediction.
* Describe how a hypothesis and a generalization relate.
* Describe the necessity for observations and characterization of patterns to understand the invisible
* Describe how organization/categorization can predict the unknown
* Explain the value of comparing and contrasting to learn about how and why something works as it does.
* Describe differences in the process of scientific discovery as described in Derry: Serendipity and Methodical Work, Detailed Background and Dreamlike Vision, Idealized models and Mathematical Calculations, Exploration and Observation, the Hypothetico deductive method
* Describe the value of a model regardless of whether it models the phenomena exactly.
* Provide examples of scientific contributions that did not involve experimentation
* Determine the tools used by a certain type of scientist
* Describe the activities that a given type of scientist engages in during a typical day.
* Recognize science vs. pseudoscience
* Rate the quality of evidence used to support an argument
* Provide examples of big ideas which flow through the sciences
* Describe how each field of science relates
* Describe how a person becomes an expert.