

## Sample Scientific Inquiry/ 21<sup>st</sup> Century Skills 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.