

## **Theme Design Guidelines: Science Inquiry Perspective**

Science uses a *process* where knowledge about the physical world and its phenomena is gained through a systematic method of inquiry called the scientific method. This involves the recognition and formulation of a problem, collection of data through observation and experimentation, development and testing of hypotheses and presentation of results. Measurements are typically made and the findings expressed mathematically. Whatever the approach, it is important that results be *validated*. The outcomes of scientific endeavors are theories and paradigms that scientists can debate and continue to research.

The goal for any general education curriculum with respect to science is to educate students in the difference between knowledge that is presented as fact, with little or no verification, and knowledge that is generated and validated based on rigorous testing. In the truest sense of general education it is the *process of science* that needs to be learned. Inherent is the understanding that questions are not fully answered and indeed should lead to more in-depth investigations into complex phenomena. The notion that science is absolute should be dispelled; the reality is that scientists produce models and data that are then subject to discourse and debate.

### **Themes designed to teach the process of science should require students to:**

1. Gain knowledge about the physical world and an understanding of the scientific method;
2. Investigate questions through inquiry-based pedagogy that involves experimentation and inferential analysis;
3. Interpret scientific information where a synthesis of ideas is achieved;
4. Use quantitative and mathematical concepts, especially data presented in graphical or tabular form, to interpret results;
5. Discuss scientific findings and examine the nature of contemporary scientific debates.