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Alignment with the NGSS Science and Engineering Practices for K-12 Science Classrooms

Practice	Description	Story Example
Asking questions and defining problems	A basic practice of the scientist is formulating empirically answerable questions about phenomena, establishing what is already known, and determining what questions have yet to be satisfactorily answered.	What are the ecological effects that occur when algae, bacteria, and viruses interact with by products from human activity? What can I do to bring deaf and hard of hearing students into STEM?
Developing and using models	Involves construction of a wide variety of models and simulations to help develop explanations about natural phenomena.	See below.
Planning and carrying out investigations	A major practice of scientists is planning and carrying out a systematic investigation, which requires the identification of what is to be recorded and what are to be treated as the dependent and independent variables. Observations and data are used to test existing theories and explanations or to revise and develop new ones.	Studies ecological effects of pollutants in the Chesapeake Bay and Anacostia River.
Analyzing and interpreting data	Scientists use a range of tools—including tabulation, graphical interpretation, visualization, and statistical analysis—to identify the significant features and patterns in the data.	Analyzes the occurrence of algal blooms and pollutants.
Using mathematics and computational thinking	Scientists use a range of computational devices for data collection and analysis.	See above.
Constructing explanations and designing solutions	Scientists construct explanations of phenomena that incorporate their current understandings and are of consistent with available evidence.	Outcomes used to determine prevention measures which can be implemented in conservation efforts. Tries to show students that they can. Students don't realize that science is very diverse and that they can work in a variety of places. There are going to be struggles and barriers that are out there. Having mentors and allies is critical. Science and math require grit. Advancements in technology make it easier.
Engaging in argument from evidence	Scientists defend their explanations, examine their own understandings, examine their own understandings, and collaborate with peers in searching for the best explanation for the phenomenon being investigated.	As a biology professor and administrator, works directly with students.
Obtaining, evaluating, and communicating information	Scientists read and write texts and communicate orally.	Communicates via online channels and in person.

