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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.	How do fault systems change over time?
Developing and using models	Involves construction of a wide variety of models and simulations to help develop explanations about natural phenomena.	Uses clay to create a smaller and faster copy of earth's processes. A 100-kilometer fault that takes millions of years to evolve, takes a few hours on a tabletop and lets us watch, measure and see how small faults link up to make a larger fault.
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.	An experimental table uses the clay to simulate millions of years of deformation of 100 kilometers of the Earth's crust in a few minutes. One side of the table is fixed. The other side is connected to a motor, that follows the deformation of the clay down the table. Uses a computer to analyze how the pixels of red and black clay change. Able to see changes as small as .15 millimeters.
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.	Conducts coding and analysis of the data collected.
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.	Has captured different conditions for fault formation that might drive faulting in the Earth's crust.
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.	Shares and discusses findings with other students, professors, and colleagues.
Obtaining, evaluating, and communicating information	Scientists read and write texts and communicate orally.	Communicates via online channels, publications and talks.