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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 is the DNA structure of the connexin 26 gene responsible for hearing loss?
Developing and using models	Involves construction of a wide variety of models and simulations to help develop explanations about natural phenomena.	N/A
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.	His research joins his computer science background with biology and merges the two fields together to study DNA. His investigations are carried out in a dim room and involve equipment that is digital for data collection and can tolerate some light. The equipment used is always connected to a computer. Uses polymerase chain reaction machines equipped with a 96-well plate that can hold 96 different samples. Machines read changes in color that occur when assaying the sample's DNA. The computer can read these color changes quickly and translate them into numbers and data.
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 to detect, identify, and quantify the DNA.
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.	Uses results to explain the worldwide prevalence of three specific variants of the connexin 26 gene responsible for hearing loss.
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 professor, shares and discusses findings at meetings and via publications.
Obtaining, evaluating, and communicating information	Scientists read and write texts and communicate orally.	Communicates via online channels and in person.

