Nature of Science Examples
(From the Sonar Mapping Activity and Seafloor Spreading)

Nature of Science Elements	Description
*Overarching Nature of Science Idea	Connect their understanding to real world scientific practices and ideas to own classroom experiences (e.g., discussion, laboratory activities).
Science & Engineering Practices	
Scientific Investigations Use a Variety of Methods	Describes multiple ways (e.g., methods, tools, theoretical underpinnings) science is conducted. *For example: Seafloor mapping initially was collected using long ropes and now the phenomenon is studied using sound waves.*
Scientific Knowledge is Based on Empirical Evidence	Identifies accurate examples of data used for evidence. *For example: Much of the data about the seafloor is collected without direct observations. Instead, scientists measure the time it takes for sound waves to reflect off the ocean floor.*
Scientific Knowledge is Open to Revision in Light of New Evidence	Open to input from multiple sources. *For example: Alfred Wegener, meteorologist, postulated that the continents had once been a super continent. Precursor to today's theory about seafloor spreading.*
Scientific Models, Laws, Mechanisms, and Theories Explain Natural Phenomena	Compares and contrasts historical and modern day ideas about natural phenomena. Can generate models to explain phenomenon. *For example: the sonar mapping activity graph can serve as a model of the seafloor.*
Crosscutting Concepts	
Science is a Way of Knowing	Communicates specific examples of how science is used to solve problems in the real world. *For example: the study of the seafloor involves both the collection of data and a description of the processes necessary to explain the changes over time. Many scientists*

	and non-scientists are involved in understanding the seafloor (See http://exploretheseafloor.net.au/ for a citizen science project of the seafloor).
Scientific Knowledge Assumes an Order and Consistency in Natural Systems	Identifies patterns in data and can infer future outcomes from pattern. *For example: earth features such as mountains and valleys are found on all of the Earth's crust including the seafloor. The assumption that patterns are found in nature allows scientists to make inferences from data (e.g., pictures) collected on newly discovered terrestrial planet and the surface features.*
Science is a Human Endeavor	Identifies that science is a unique practice to humans. *For example: Beth Christensen from Long Island's Adelphi University studies the seafloor for erosion; other scientists have studied the seafloor for speed of spreading.*
Science Addresses Questions About the Natural and Material World.	Identifies natural cause for events observed in the classroom and science; explains how science interprets the natural phenomenon. *For example: the study of the seafloor has used a variety of tools that change as new technologies are created.*