NGSS CORRELATIONS

LAND, WATER, AND HUMAN INTERACTIONS

Crosscutting Concepts		Activity Number
Cause and Effect	Cause-and-effect relationships may be used to predict phenomena in natural or designed systems.	6, 11
	Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation.	1, 3, 4, 5, 6, 14, 15, 16
Energy and Matter	Within a natural system, the transfer of energy drives the motion and/or cycling of matter.	2, 7, 8, 9, 12, 13, 14
Patterns	Patterns can be used to identify cause-and-effect relationships.	4
	Graphs, charts, and images can be used to identify patterns in data.	3, 10
Stability and Change	Small changes in one part of a system might cause large changes in another part.	9
	Stability might be disturbed either by sudden events or by gradual changes that accumulate over time.	7, 11, 12, 13, 14
Scale, Proportion, and Quantity	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large to observe all at once or too small to see clearly	4, 6, 7, 8, 10, 11, 12, 13, 14
Connections to Engineering, Technology, and Applications of Science	The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus, technology use varies from region to region and over time.	5, 7, 12, 13, 14, 16
	Stability might be disturbed either by sudden events or by gradual changes that accumulate over time.	7, 11, 12, 13, 14
Influence of Science, Engineering, and Technology on Society and the Natural World	All human activity draws on natural resources and has both short- and long-term consequences, positive as well as negative, for the health of people and the natural environment.	1, 3, 4, 6, 9, 12, 15, 16
Connections to the Nature of Science: Science Is a Way of Knowing	Science is a way of knowing by many people, not just scientists.	15

Science and Engineering Practices		Activity Number
Analyzing and Interpreting Data	Analyze and interpret data to provide evidence for phenomena.	4
	Construct and interpret graphical displays of data to identify linear and nonlinear relationships.	3
	Use graphical displays (e.g., maps, charts, graphs, and/or tables) of large data sets to identify temporal and spatial relationships.	10, 11
	Distinguish between causal and correlational relationships in data	3, 4
Asking Questions and Defining Problems	Define a design problem that can be solved through the development of an object, tool, process, or system and has multiple criteria and constraints, including scientific knowledge that may limit possible solutions.	7, 12
	Ask questions to identify and clarify evidence of an argument.	1
Constructing Explanations and Designing Solutions	Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe nature operate today as they did in the past and will continue to do so in the future.	5, 7, 11, 12, 13, 14
	Apply scientific ideas or principles to design an object, tool, process, or system.	7, 12, 15, 16
	Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events.	2, 8, 9, 11
Developing and Using Models	Develop a model to predict and/or describe phenomena.	10
	Develop a model to describe unobservable mechanisms.	6, 8, 9
	Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs.	5, 7, 12
Engaging in Argument from Evidence	Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon.	4
	Evaluate competing design solutions based on jointly developed and agreed-on design criteria.	12, 16
	Respectfully provide and receive critiques about one's explanations, procedures, models, and questions by citing relevant evidence and posing and responding to questions that elicit pertinent elaboration and detail.	6
Obtaining, Evaluating, and Communicating Information	Integrate qualitative scientific and technical information in written text with that contained in media and visual displays to clarify claims and findings.	6, 9, 14

Science and Engineering Practices		Activity Number
Planning and Carrying Out Investigations	Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation.	2, 5, 10
Connections to the Nature of Science	Scientific knowledge is based on logical and conceptual connections between evidence and explanations.	3, 4, 6, 11
Disciplinary Core Ideas		**Activity Number**
Defining and Delimiting Engineering Problems (ETS1.A)	The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions.	7, 12
Developing Possible Solutions (ETS1.B)	There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.	12, 16
Earth's Materials and Systems (ESS2.A)	The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future.	4, 6, 7, 8, 9, 10, 11, 13, 14, 15
The Roles of Water in Earth's Surface Processes (ESS2.C)	Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land.	2 (12), 5 (21), 7 (37), 8 (43, 46, 47), 9 (50, 54), 14 (88), 15 (96)
	Global movements of water and its changes in form are propelled by sunlight and gravity.	7, 8, 9, 13, 15
	Water's movements—both on the land and underground— cause weathering and erosion, which change the land's surface features and create underground formations.	7, 11, 12, 13, 14, 15, 16
Human Impacts on Earth Systems (ESS3.C)	Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (both negative and positive) for different living things.	1, 3, 4, 5, 6, 9, 14, 15, 16
	Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.	1, 3, 5, 6, 9, 14, 15, 16
Structure and Properties of Matter (PS1.A)	Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.	2

Disciplinary Core Ideas		Activity Number
Interdependent Relationships in Ecosystems (LS2.A)	Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.	4
Ecosystem Dynamics, Functioning, and Resilience (LS2.C)	Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all of its populations.	4
Performance Expectations		**Activity Number**
Earth's Systems (ESS2)	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. (MS-ESS2-2)	14
	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. (MS-ESS2-4)	9
	Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.* (MS- ESS3-3)	16
Engineering Design (ETS1)	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. (MS-ETS1-1)	12
	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. (MS-ETS1-2)	16

COMMON CORE STATE STANDARDS CORRELATIONS

LAND, WATER, AND HUMAN INTERACTIONS

Common Core State Standards – English Language Arts		Activity number
Reading in Science and Technical Subjects (RST)	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. (RST.6-8.1)	6, 9, 14
	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (RST.6-8.2)	15
	Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks. (RST.6-8.3)	2, 4, 5, 7, 10, 12
	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (RST. 6-8.9)	9, 13
Speaking and Listening (SL)	Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound and valid reasoning, and well-chosen details: use appropriate eye contact, adequate volume, and clear pronunciation. (SL.8.4)	16
Writing in History/ Social Studies, Science, and Technological Subjects (WHST)	Write informative/explanatory texts to examine and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (WHST.6-8.2)	8, 15, 16
	Draw evidence from informational texts to support analysis, reflection, and research. (WHST.6-8.9)	13, 15
Common Core State Standards – Mathematics		**Activity number**
Mathematical Practice (MP)	Reason abstractly and quantitatively. (MP.2)	10, 11
	Model with mathematics. (MP.4)	3, 10, 11
Ratios and Proportional Reasoning (RP)	Understand the concept of a ratio, and use ratio language to describe a ratio between two quantities. (6.RP.A.1)	4
Statistics and Probability (SP)	Summarize numerical data sets in relation to their context. (6.SP.B.5)	3, 4