Big Idea:
Fossils can tell us about organisms from long ago and how they may have changed due to changing environments.
Guiding Questions:
Part A: What do fossils tell us about the organisms and the environments in which they lived?
Part B: What happens to the plants and animals when the environment changes?

21st Century Themes/Skills:

DCI (Disciplinary Core Ideas)	*Science and Engineering Practices*	*Crosscutting Concepts*	*Student Learning Objectives*	*Differentiated Activities (Consider the 5 Es)*	*Resources/Technology*	*Formative Assessments*	*Benchmark Assessment*
LS4.A: Evidence of Common Ancestry and Diversity Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (Note: moved from K-2) Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. **LS2.C: Ecosystem Dynamics, Functioning, and Resilience** When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.(secondary) **LS4.D: Biodiversity and Humans** Populations live in a variety of habitats, and change in those habitats affects the organisms living there. **ETS1.A: Defining and Delimiting Engineering Problems** Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.	**Analyzing and Interpreting Data** Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. Analyze and interpret data to make sense of phenomena using logical reasoning. **Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. **Asking Questions and Defining Problems** Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships. Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.	**Scale, Proportion, and Quantity** Observable phenomena exist from very short to very long time periods **Connections to Nature of Science** Scientific Knowledge Assumes an Order and Consistency in Natural Systems **Systems and System Models** A system can be described in terms of its components and tScientific Knowledge Assumes an Order and Consistency in Natural Systems heir **Interdependence of Engineering, Technology, and Science on Society and the Natural World** Knowledge of relevant scientific concepts and research findings is important in engineering. **Influence of Science, Engineering, and Technology on Society and the Natural World** People's needs and wants change over time, as do their demands for new and improved technologies.	Students will observe and discuss the prey/predator relationship and the way organisms respond to changes in their environment as an introduction to survival.	**Engage:** Discovery Education Video Segment on prey / predator relationship and "Survival" interactive	Video Resources Survival Interactive	-Activity Student Sheets of Responses (see links in Resources/Technology for each lesson) -Class discussion -Science journal entries -Predictions -Questions -Observations -Group collaboration -Exit Slips (paper-based, Google Forms, Google Classroom post, etc.)	
			Students will observe what may happen to living things when an ecosystem changes.	**Explore:** Discovery Education Hands-On Activity Surviving in a Changing Ecosystem	Activity		
			Students will investigate and explore endangered species and ecosystems to determine how changes in the environment affected the ways the organisms survived and reproduced, moved to new locations, or died.	**Explore:** Scholastic Explorers: Endangered Ecosystems	Endangered Ecosystems		
			Students will observe how population and resource changes in an environment affect the survival of organisms from very short to very long time periods as well as how their needs and wants change over time due to demand.	**Explore:** How population and resources within changes of the environment affect organisms' survival	Food Fight		
			Students will explore and investigate how camouflage can benefit animals as survival	**Explore:** Camouflage can benefit animals as survival	Moth of a Different Color (Discovery Education) Peppered Moth Simulation		
			Students will identify cause-and-effect relationships with problem in environment and organisms' responses, using these relationships to explain the changes that might occur in the environment and in the populations of organisms that live there.	**Explain:** Conduct research, using books and other reliable media sources, to determine possible solutions/ways in which organisms can solve the problem of given change in an environment			
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			Students will create their own fossils, and then use multimedia resources to learn how real fossils form and what scientists can learn from them.	**Explore (3 sessions):** Discussion of prior knowledge of fossils; "Fun with Fossils" Activity where students investigate what scientists can learn from fossils (As they learn about organisms from long ago, they come to understand that when the environment changes, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die.)	Fun with Fossils		
			Students research how fossils are formed and found to learn about the types of organisms that lived long ago and the nature of their environments.	**Explain:** BBC resources to explain aspects of fossils	Nature of Prehistoric Life Burying Fossils What is a fossil?		
			Students will explore the different types of fossils and explain how these fossils are formed and what we can learn from them.	**Explain:** Scholastic PowerPoint of fossils	Scholastic PowerPoint		
			Students will create a model fossil and will explain the steps of an organism becoming a fossil while explaining the difference between a "model" and a "cast" fossil. Students will write an explanation of what someone could learn from their fossil if they were to find it 100 years from now.	**Explain & Evaluate:** Students will create a model fossil and will explain the steps of an organism becoming a fossil while explaining the difference between a "model" and a "cast" fossil. Students will write an explanation of what someone could learn from their fossil if they were to find it 100 years from now.	Make a Model Fossil		

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specified criteria for success or how well each takes the constraints into account.				**Additional Links and Resources -->**	Fossils for Kids Hands-On Activities The Paleontology Portal One Geology		