

# PROJECT DESIGN: OVERVIEW

page 1

<b>Name of Project: Where can we find energy?</b>		<b>Duration: October</b>	
<b>Subject/Course: Science</b>	<b>Teacher(s):</b>		<b>Grade Level: K</b>
<b>Other subject areas to be included, if any:</b>			
<b>Key Knowledge and Understanding</b> (CCSS or other standards)	<p style="color: purple;">K-PS2 Motion and Stability: Forces and Interactions- ENERGY EFFICIENCY</p> <p style="color: purple;">"K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*"</p> <p style="color: purple;">K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*</p> <p style="color: purple;">K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.</p>		
<b>Success Skills</b> (to be taught and assessed)	<b>Critical Thinking/Problem Solving</b>	<b>X</b>	<b>Communication</b>
	<b>Collaboration</b>	<b>X</b>	<b>Perseverance</b>
	<b>Creativity and Innovation</b>	<b>X</b>	<b>Presentation</b>
			<b>X</b>

<b>Project Summary</b> (include student role, issue, problem or challenge, action taken, and purpose/beneficiary)	<p>Student role/ Challenge:          This project will focus on students understanding where energy can be found within themselves and in the world around them.          Students will focus on the challenge of understanding:          Where is my energy? (exploring what energy looks like using their bodies and where it comes from)          How can I change my energy? (exploring what things they can do to change -make stronger or weaker - their energy)          Where can I see energy? (exploring the community in the school and outside to find and document energy they can see working)          How does the wind create energy? (exploring the way wind makes things happen out in their neighborhood and the garden area)</p> <p>Action taken / purpose:</p> <ul style="list-style-type: none"> <li>● create a picture journal of their own energy to explain to family and reading buddies</li> <li>● document energy they can see in a poster for the school</li> <li>● keep wind journal and take wind walks to grow understanding of this type of energy</li> </ul> <p>Final product: Students will create flags and art pieces to populate a wind garden that can serve as a weather vane for the school community and represent who they are as they kickoff their kindergarten year.</p>			
<b>Driving Question</b>	<b>Where can we find energy?</b>			
<b>Entry Event</b>	Students will do a gallery walk with a partner to view many pictures around the classroom and hallway focused on the question “Donde ves la energía?” .			
<b>Products</b>	Individual: Flags and art pieces with individual identity			Specific content and competencies to be assessed: Understanding cultural and personal identities Building connections to personal heritage
	Team: Wind garden			Specific content and competencies to be assessed: Wind energy can help power tools for information Wind energy is a natural way

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**Making Products Public**  
(include how the products will be made public and who students will engage with during/at end of project)

**Community members (families, staff, and students) will be invited to visit the wind garden. Local weather media will be invited to do a segment about the wind garden project on tv. Students will share what they did to build the wind garden and understand the direction of the wind.**

**Resources Needed**

- On-site people, facilities: Kindergarten team, facilities manager - outdoor space
- Equipment: weather vane structure
- Materials: fabric, markers or crayons, journals
- Community Resources: weather expert, engineer

**Reflection Methods**

(how individual, team, and/or whole class will reflect during/at end of project)

Journal/Learning Log	X	Focus Group	
Whole-Class Discussion	X	Fishbowl Discussion	
Survey		Other:	X

# PROJECT DESIGN: OVERVIEW

page 1

**Name of Project:** Could trees and plants survive without leaves?

**Duration:**  
October

**Subject/Course:** Science

**Teacher(s):**

**Grade Level:** 1

**Other subject areas to be included, if any:**

**Key Knowledge and Understanding**  
(CCSS or other standards)

1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.\*

1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year.

K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

**Success Skills**  
(to be taught and assessed)

**Critical Thinking/Problem Solving**

X

**Communication**

X

**Collaboration**

X

**Perseverance**

X

**Creativity and Innovation**

X

**Presentation**

X

<p><b>Project Summary</b> (include student role, issue, problem or challenge, action taken, and purpose/beneficiary)</p>	<p>Student role/ challenge This project will focus on students studying the trees around the neighborhood and understanding the function of their leaves: How do leaves help plants/trees survive? (exploring the shapes and characteristics of leaves with magnifying glasses) How are leaves the same and different? (collecting and classifying leaves) What do leaves do? (exploring how leaves help “feed” trees) How are trees like bears? (understanding what happens to deciduous trees in the winter)</p> <p>Action taken / purpose:</p> <ul style="list-style-type: none"> <li>● begin a science journal to draw observations of leaves and make comparisons</li> <li>● document what students think the features they observe in leaves do for plants/trees</li> <li>● graph the different colors and types of leaves</li> </ul> <p>Final product: Students will create a “soil-arium” in jars. Students will compost leaves and other materials to create rich soil for planting in the garden in the spring. <a href="https://www.tomsofmaine.com/good-matters/thinking-sustainably/activities-to-teach-composting-for-kids">https://www.tomsofmaine.com/good-matters/thinking-sustainably/activities-to-teach-composting-for-kids</a></p>			
<p><b>Driving Question</b></p>	<p>How can trees and plants survive without leaves?</p>			
<p><b>Entry Event</b></p>	<p><a href="https://web.extension.illinois.edu/trees1_sp/04.html">https://web.extension.illinois.edu/trees1_sp/04.html</a></p>			
<p><b>Products</b></p>	<p>Individual: adopt a tree - students will choose a tree outside to observe throughout the year</p>			<p>Specific content and competencies to be assessed: Make observations at different times of year.</p>
	<p>Team: composting leaves - students will create a “soil-arium” which will grow into rich soil for their garden in the spring.</p>			<p>Specific content and competencies to be assessed: Use materials to design a solution to a problem by mimicking what plants do.</p>

# PROJECT DESIGN: OVERVIEW

page 1

**Name of Project: How do fossils tell our story?**

**Duration:  
October**

**Subject/Course: Science**

**Teacher(s):**

**Grade Level: 6**

**Other subject areas to be included, if any: literacy**

**Key Knowledge and Understanding**  
(CCSS or other standards)

[Link to MS.Natural Selection and Adaptations](#)

MS-LS4-1. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. [Clarification Statement: Emphasis is on finding patterns of changes in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers.] [Assessment Boundary: Assessment does not include the names of individual species or geological eras in the fossil record.]

MS-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. [Clarification Statement: Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures.]

MS-LS4-3. Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. [Clarification Statement: Emphasis is on inferring general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures.] [Assessment Boundary: Assessment of comparisons is limited to gross appearance of anatomical structures in embryological development.]

MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. [Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations.]

MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability statements, and proportional reasoning to support explanations of trends in changes to populations over time.] [Assessment Boundary: Assessment does not include Hardy Weinberg calculations.]

**Success Skills**  
(to be taught and assessed)

**Critical Thinking/Problem Solving**

X

**Communication**

X

**Collaboration**

X

**Perseverance**

X

**Creativity and Innovation**

X

**Presentation**

X

<p><b>Project Summary</b> (include student role, issue, problem or challenge, action taken, and purpose/beneficiary)</p>	<p>Student role/ issue This project will focus on students examining human and animal fossils of the past to trace evolution and natural selection through time. Students will consider how fossils can indicate changes and explore what a modern fossil would be.</p> <p>Action taken/ purpose What is a fossil? (exploring how fossils form) What do fossils tell us about organism adaptations? (exploring what information can be gained from fossils) How can humans create fossils to demonstrate change over time? (exploring how humans mark adaptations and change over time)</p> <p>Final product: Students will work in teams to create a “digital fossil” showing what tools and adaptations human use to survive during present time.</p>			
<p><b>Driving Question</b></p>	<p><b>How do fossils tell our story?</b></p>			
<p><b>Entry Event</b></p>	<p><a href="https://tarpits.org/learning-resource/why-did-mammoths-go-extinct-0">https://tarpits.org/learning-resource/why-did-mammoths-go-extinct-0</a></p>			
<p><b>Products</b></p>	<p>Individual: Digital human fossil</p>			<p>Specific content and competencies to be assessed: Understanding that fossils show adaptation Building connections to human experience of innovating to meet need</p>

	Team: Reading Buddy Fossil Story			Specific content and competencies to be assessed: Explaining the concept of fossils in simple terms Building connections to facilitate learning
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**PROJECT DESIGN: OVERVIEW** page 2

<b>Making Products Public</b> (include how the products will be made public and who students will engage with during/at end of project)	<p><b>The students will create a web page to display and share the digital fossils with the public. Students will ask the Providence Children’s Museum to link the page to their site as well.</b></p> <p><b>The fossil stories will be read to the students’ K and 1 reading buddies.</b></p>
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<b>Resources Needed</b>	On-site people, facilities: 6th grade team, Technology teacher, K/1 students		
	Equipment: digital program for fossil template and web page development		
	Materials: computers, fossil samples		
	Community Resources: Providence Children’s Museum		

<b>Reflection Methods</b> (how individual, team, and/or whole class will	Journal/Learning Log		Focus Group	X
	Whole-Class Discussion	X	Fishbowl Discussion	X
	Survey	X	Other:	

# PROJECT DESIGN: STUDENT LEARNING GUIDE

**Project:**

**Driving Question:**

<b>Final Product(s)</b> Presentations, Performances, Products and/or Services	<b>Learning Outcomes/Targets</b> knowledge, understanding & success skills needed by students to successfully complete products	<b>Checkpoints/Formative Assessments</b> to check for learning and ensure students are on track	<b>Instructional Strategies for All Learners</b> provided by teacher, other staff, experts; includes scaffolds, materials, lessons aligned to learning outcomes and formative assessments

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