Kindergarten Science Unit 4: Effects of the Sun

Unit Summary: During this unit of study, students apply an understanding of the effects of the sun on the Earth's surface. The crosscutting concepts of cause and effect and structure and function are called out as organizing concepts for this disciplinary core idea. Students are expected to demonstrate grade-appropriate proficiency in developing and using models; planning and carrying out investigations; analyzing and interpreting data; and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Stage 1 – Desired Results

Performance Expectations: (PE) (Established Goals / Content Standards)

K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water.] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]
K-PS3-2 Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth's surface. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]
K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
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.

Enduring Understandings Students will understand • The sun is a star and warms Earth's surfaces in different amounts. • Shade is an area where the sun is blocked. • It is cooler in the shade than in the sun. • Earth spins which gives us night and day.	**Essential Questions** • EQ: *How does the sun warm different surfaces and why? *How can we reduce the warming effect of the sun? *How does the sun give us daytime?

Questions that guide lessons:

- What are the characteristics of the sun?
- What does the sun do for the earth?
- Does the sun warm water or sand more? Why?
- What is shade?

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out	**PS3.B: Conservation of Energy**	**Cause and Effect**

Investigations ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) **Constructing Explanations and Designing Solutions** ● Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) **Asking Questions and Defining Problems** ● Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) ● Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)	**and Energy Transfer** ● Sunlight warms Earth's surface. (K-PS3-1),(K-PS3- 2) **ETS1.A: Defining and Delimiting Engineering Problems** ● A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) ● • Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) ● Before beginning to design a solution, it is important to clearly understand the problem. (K2-ETS1-1)	● Events have causes that generate observable patterns. (K-PS3-1),(K-PS3-2) Structure and Function • The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2) **Connections to Nature of Science Scientific Investigations Use a Variety of Methods** ● Scientists use different ways to study the world. (K-PS3-1)
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Stage 2 – Assessment Evidence	
Summative Performance Task(s) ● Students will model the effects of the sun through several real life experiments, including a melting station, evaporation, and clothing choices The effects of the sun on Earth's surface Anchor Chart How will Jack's plants grow? The effects of the sun phenomena chart Snowman melt timelapse video Save a snowman STEM activity "Be Cool with popsickles" Engineering and Design Process Build a UV sensitive animal a shelter from the sun Homemade sundial **Audience:** ● Peers, teacher, self-reflection **Criteria:** ● Teacher observation	**Formative Evidence:** Through what other evidence will students demonstrate achievement of the desired results? ● (Suggested) 2-4 question oral comprehension checks ● Teacher observation ● Class Discussion/ Anecdotal notes ● (possible) Mystery Science end-of-mystery assessment ● Standard K-PS3-1 Assessment Checklist ● Standard K-PS3-2 Assessment Checklist ● PBL activity -Will It Melt?

Stage 3 – Learning Plan / Road Map (Design to make as student centered as possible)

Suggested Resources for Planning:

Kindergarten Science Unit 4 Suggested Activities Folder
Reading A to Z Non-Fiction Anchor Texts
www.thewonderofscience.com
Phenomena Photo of a windcatcher in the dessert
Monkey Bars Anchor ChartPhenomena of homemade thermometer

Learning Activities:

STEM Activity:

Create a doghouse to protect your puppy from the sun
How to make a sundial
Art extension after melting crayons
How does the sun warm the earth's surfaces
7 STEM activities on effects of the sun
Sun Protection Activity

Suggested Methods: (The following methods anchor learning with a purpose, mitigating the "why do I need to know this" questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence