Phoenixville Area School District UbD Science Unit Plan

Grade: K **Unit:** Trees & Weather **Authors:** R. Lovelidge & L. Miller (PAELC)

Stage 1 Desired Results

Overarching NGSS & PA Standards:

3.1.K.A Use observations to describe patterns of what plants and animals (including humans) need to survive.

3.3.K.A Use and share observations of local weather conditions to describe patterns over time.

3.3.K.B Construct an argument supported by evidence for how plants and animals (including humans) can

Transfer

Students will be able to independently use their learning to…

- Ask questions and/or define problems
- Plan and/or carry out investigations
- Analyze and interpret data using computational thinking
- Obtain, evaluate, and communicate information (supported by evidence)
- Construct explanations and design solutions

Meaning-Making

Students will understand that…

- Plants and animals need certain necessities to survive.
- Plants and animals depend on each other for survival.
- When plants and animals obtain their needs, it can have an affect the environment around them.
- Things people do to live comfortably, can affect the world around them; but, they can make choices that reduce their impact on the land, water, air, and other living things.
- Humans use natural resources for everything they do.

*Every time "animals" is written it should be inferred that humans are included in this group

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- Weather is the combination of sunlight, wind, snow or rain, and temperature in a region.
- People measure and record weather conditions to notice patterns over time and make forecasts.
- Weather scientists forecast severe weather to allow communities to prepare and respond to events.
- Severe weather varies depending on region/location.

ESSENTIAL QUESTIONS

- Why do we need to eat?
- What do plants need to survive?
- What do animals need to survive?
- What do animals eat?
- How do plants and animals depend on each other?
- Are all plants the same?
- Are all animals the same?
- How are plants and the environment related?
- How are animals (including humans) and the environment related?
- How do human choices impact the world around them?
- How do humans use natural resources?

change the environment to meet their needs. **3.3.K.C** Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live. **3.3.K.D** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. **3.2.K.C** Make observations to determine the effect of sunlight on Earth's surface.	• Our region has four seasons, and each season has its own kind of weather.	• Why do humans need natural resources? • How can humans make choices to reduce their impact on the land, water, air, and other living things * * * * * • What is weather? • How do we measure weather? • How is weather forecasted? • How do we forecast severe weather? • How do weather forecasts help us respond and prepare for the weather?
	Knowledge and Skills Acquisition	

	UNDERSTANDINGS
	Students will know…
	
	• Plants need light to live and grow.
	• Animals need food to live and grow.
	• Plants and animals need water to live and grow.
	• Animals get their food from plants, other animals, or both.
	• There are many different types of plants and animals.
	• Plants and animals can change their environment when trying to obtain their needs. (e.g. plant roots lifting sidewalks because they need space to grow, using natural resources to build things).
	• The relationship between plants and animals and the other (non-living) resources they need to survive.
	• The relationships between places where different plants and animals live and the resources those places provide.
	• That plants, animals, the places where they live, and the resources they need, are all parts of a system. These systems work together to make sure living things have what they need to survive.
		Students will be skilled at…
		
		• Using their senses to make observations and record their findings:
		  o to describe plants *in their science journal*
		  o to describe animals
		• Using models to study plant and animal characteristics
		• Recognizing patterns in feeding relationships
		• Asking questions based on observations to find out more information about the world's weather.

3.2.K.D Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. STEM- K–2 ETS1-2 **Which branch(es) of science apply:** **LS, PS E&SS**	• That the needs of different plants and animals are met by the various places in which they live. • That people affect the land, water, air, and/or other living things in the local environment in positive and negative ways. • That solutions exist to reduce the negative effects of humans on the local environment. • Examples of things that people do to live comfortably and how those things can cause changes to the land, water, air, and/or living things in the local environment. • Examples of choices that people can make to reduce negative impacts and the effect those choices have on the local environment. *Every time "animals" is written it should be inferred that humans are included in this group * * * * * • How to record and read weather graphs to identify the number of sunny, cloudy, rainy, windy, cool, or warm days in a given period • There are differences in relative temperature over the course of each day. Relative temperatures over the course of the day are directly related to the time of day (cooler in the morning, warmer during the day/afternoon, cooler in the evening) in our region. • Certain seasons/months have different kinds of weather than other seasons/months. Winter is generally colder with chances of snow, spring is warmer and rainy, summer is hot and sunny, and fall is gradually cooler in our region. • Weather forecasting of severe weather can help people avoid the most serious impacts of severe weather events. • There are patterns related to severe local weather that can be observed • Weather patterns help scientists predict severe weather before it happens. • Severe weather warnings are used to communicate predictions about severe weather. • Weather forecasting can help people plan for, respond to specific times of local weather. **KEY VOCABULARY**	• Reading graphs to interpret data about weather. • Using observations to describe patterns in local weather over time by creating a weather graph in their science journal. • Using observational data to make predictions about weather within each season by using their weather graph in their science journal. • Identifying solutions to prepare for severe weather.

	Animal Food Living Needs Nonliving Sunlight Plant Sun Observation Survive Air Shelter Nutrient Space (room to grow) Senses Earth Environment Habitat	Litter Man-made Material Natural Pollute Recycle Reduce Reuse * * * * * Weather Precipitation Pattern Cloudy Partly cloudy Sunny Rain Snow Thunderstorm Blizzard	Hurricane Tornado Sun Sunlight Earth Forecast Temperature Thermometer Cool Warm Day Night Seasons Winter Spring Summer Fall Rotation Revolution	

Stage 2 – Evidence

Evaluative Criteria	***Assessment Evidence***	
What criteria will be used in each assessment to evaluate attainment of the desired results? Rubrics related to each will be developed.	**PERFORMANCE TASK(S):** Investigations: I. **Task(s):** Students engage with the phenomenon of trees. Students begin their study of trees by looking at the variety and structure of trees in the schoolyard. They work with representational materials to look more closely at the shapes of trees and their parts. They adopt schoolyard trees to observe changes through the year. A living tree becomes part of the classroom for several weeks, and students complete the investigation by planting their class tree on the school grounds. **Assessment:** Investigation 1 I-Check II. **Task(s):** Students engage with the phenomenon of leaves. Students begin with a schoolyard walk, focusing on the leaves of trees. They match leaves with geometric shapes, go on a leaf hunt to compare properties of leaves, work at centers with representational materials, and make a leaf book. This investigation concludes with a story, *Our Very Own Tree*.	**Differentiation Considerations:** For labs, consider that some students may wish to: • explain verbally instead of in a written format • draw their responses • write in their first language If challenges arise with the complexity of the task(s), some students may need: • more incremental steps

	Assessment: Investigation 2 I-Check III. **Task(s):** Students engage with the phenomenon of local weather. Students share what they know about weather and how it relates to air. A class weather monitor begins recording daily weather observations on a class calendar. Students use weather pictures to indicate five basic types of weather. They use a thermometer to measure relative temperature (how hot or cold it is) and make a windsock to observe the wind direction and speed. Students observe and compare objects in the sky during the day and at night. **Assessment:** Investigation 3 I-Check IV. **Task(s):** Students engage with the phenomenon of seasons. Students extend their understanding of trees as a growing, changing, living part of their world. During each season, students visit the schoolyard trees; observe their twigs, leaves, flowers, and seeds; and compare them to those from a previous season. They observe how trees can change their surroundings. Students discuss the guiding questions for the module. **Assessment:** Investigation 4 I-Check Unit Activities: 1. <u>Forecasting the Weather</u> **GOAL**: Your goal is to forecast the weather in Phoenixville tomorrow. **ROLE:** You are a weather scientist (a meteorologist). **AUDIENCE:** The audience is visitors coming to Phoenixville for the first time. **SITUATION**: Phoenixville is looking for some new weather scientists to help forecast the weather for our visitors! Make a weather forecast for tomorrow so that visitors to Phoenixville know exactly what to wear. **PRODUCT/PERFORMANCE AND PURPOSE:** The performance task is to look at your weather journal, make a prediction about what the weather will be tomorrow. The product is to draw what outfit you might wear in that weather. **STANDARDS & CRITERIA FOR SUCCESS:** Your drawing needs to include any articles of clothing, special footwear, or accessories that visitors might need to bring with them to prepare for the weather. 2. <u>Preparing for Severe Weather</u> **GOAL:** Your goal is to help prepare your home for the impending snowstorm. **ROLE:** You are a parent. **AUDIENCE:** The audience is your family. **SITUATION:** Your weather forecast shows that there will be a big snowstorm coming to Phoenixville tomorrow! Help your family prepare for this severe weather.	• an alternative activity Other considerations: • When grouping students consider matching different skills sets • When asking students to describe a model, give them the opportunity to draw or write it, as well. • Teacher can scribe written responses for students

	PRODUCT/PERFORMANCE AND PURPOSE: The performance task is you will brainstorm to create a list of things your family needs to do to prepare for this big snowstorm and keep everyone safe. The product is the list **STANDARDS & CRITERIA FOR SUCCESS:** Your list needs to include: ○ What rules do you and your family need to stay safe during the storm? ○ What clothing should your family be prepared to wear? ○ Any tools you will need to help them through the snowstorm?	
What criteria will be used in each assessment to evaluate attainment of the desired results? Rubrics related to each will be developed.	**OTHER EVIDENCE:** • Checklists of collaborative behaviors in labs and activities • Checklists of collaborative behaviors in class discussions • **Journal entries** ○ **Science-**Weather journal with predicted forecasts ○ Weather Journal Resource: NGSSScienceCentersWeatherPatterns-1.pdf	**Differentiation Considerations:** For journal entries, consider that some students may wish to: • draw instead of write entries • write in their first language For labs, consider that some students may wish to: • explain verbally instead of in a written format • write in their first language If challenges arise with complexity of the task(s): • smaller steps and/or • alternative activities will be provided.