Barrington Haddon Heights Lawnside Merchantville

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**Course Name: Science**

**Grade: Kindergarten**

Board Approved:

\*All curriculum is aligned with the NJSLS in accordance with the Department’s curriculum implementation timeline and includes all required components (NJ.A.C.6A:8).

\*\*Resource and activity lists are compiled from all four districts and may not necessarily be reflected in each district or school.

**Introduction**

#### New Jersey Student Learning Standards for **Science**

**Michael Heinz, Coordinator**

**Science, engineering, and technology influence and permeate every aspect of modern life. Some knowledge of science and engineering is required to engage with the major public policy issues of today as well as to make informed everyday decisions, such as selecting among alternative medical treatments or determining how to invest public funds for water supply options. In addition, understanding science and the extraordinary insights it has produced can be meaningful and relevant on a personal level, opening new worlds to explore and offering lifelong opportunities for enriching people's lives. In these contexts, learning science is important for everyone, even those who eventually choose careers in fields other than science or engineering.**

**Mission: Scientifically literate individuals possess the knowledge and understanding of scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity.**

**Vision: The science standards are designed to help realize a vision for education in the sciences and engineering in which students, over multiple years of school, actively engage in scientific and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas in these fields. The learning experiences provided for students should engage them with fundamental questions about the world and with how scientists have investigated and found answers to those questions. Throughout grades K-12, students should have the opportunity to carry out scientific investigations and engineering design projects related to the disciplinary core ideas (pp. 8-9, NRC, 2012).**

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| **STANDARD:** K-ESS2: Earth’s SystemsK-ESS3: Earth and Human ActivityK-2-ETS1: Engineering Design |
| **Unit 1: Weather**  |
| **ESTABLISHED GOALS (INDICATOR #)** | **TRANSFER (How will this apply to their lives?)** |
| K-ESS2-1: Use and share observations of local weather conditions to describe patterns over time.K-ESS3-2: Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. 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. | *Students will be able to independently use their knowledge to…** Describe patterns in weather conditions over time.
* Obtain information about the purpose of weather forecasting and the ability to respond to severe weather.
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| **MEANING** |
| UNDERSTANDINGS:* Weather is the combination of sunlight, wind, snow, or rain and temperature in a particular region at a particular time.
* People measure these conditions to describe and record the weather and to notice patterns over time.
* People look for patterns in the weather data when they organize and order when making observations about the world.
* Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
* Some kinds of severe weather are more likely than others in a given region.
* Weather scientists forecast severe weather so that communities can prepare for and respond to these events.
* Events have causes that generate observable patterns.
* People encounter questions about the natural world every day.
* People depend on various technologies in their lives; human life would be very different without technology.
* Before beginning to design a solution, it is important to clearly understand the problem.
* Asking questions, making observations, and gathering information are helpful in thinking about problems.
* A situation that people want to change or create can be approached as a problem to be solved through engineering.
 | ESSENTIAL QUESTIONS:* *How can someone predict what the weather will be tomorrow?*
* *How does weather forecasting help us to prepare for dangerous weather?*
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| **Unit 1: Grade K - Suggested Lessons** |
| **Phenomena:** Read the [local weather](https://weather.com/) forecast from an online or print resources. Make a list of the words that they use to describe weather (cloudy, sunny, partly cloudy, temperature, and wind). As a class, create symbols that the students can use to record the weather each day. Examples can be found at <http://tinyurl.com/hhhg299>. In this ongoing study, students are expected to develop an understanding of patterns and variations in local weather and how they respond to the weather.* They look for cause and effect relationships between the day’s weather and the clothing that they wear.
* They look for patterns between hazardous weather (very hot/very cold, rain, snow, and thunderstorm) and relate that to how their choices help to keep them comfortable and safe.

With adult support, students use trade books (read-alouds, big books) to learn about and discuss the weather. severe weather. Strategies, such as Think-Pair-Share, can be used to encourage students to think about information from books and to use that information to ask and answer questions about key details. With guidance, students use online media resources to view examples of severe weather. They can ask questions in order to understand how severe weather affects people and communities and to determine how communities prepare for and respond to severe weather.Students learn that we can help people to be safe from hazardous weather (thunderstorms, hurricanes, and nor-Easters,) through engineering. Students begin by comparing and contrasting hazardous weather events. With the support of the teacher, they ask scientific questions about how each type of weather is hazardous, gather information that will help them understand the types of problems they might face when severe weather conditions exist, and in and around their homes, schools, and communities, and work together to design ways to keep people safe during hazardous weather events. In this unit’s progression of learning, students first develop an understanding that patterns in the natural world can be observed and documented, and that, like scientists, they can use these patterns as evidence to describe phenomena (weather conditions) and make predictions (what will the weather be like tomorrow?). In order to observe patterns in weather, kindergartners will learn that weather is the combination of sunlight, wind, precipitation, and temperature in a particular region at a particular time (See Appendix B, Weather Chart). By observing and recording daily weather events—such as sunny, cloudy, rainy, and windy— students can analyze both qualitative and quantitative data. Recording and analyzing data over time will reveal recognizable weather patterns that can be used to make predictions. Examples of weather patterns may include:* Snow and colder temperatures generally occur in the winter.
* Clouds may bring rain or snow.
* Rain occurs more often in the spring.
* Warmer/hotter temperatures occur in the summer.
* It is generally cooler in the morning and warmer in the afternoon.

At this grade level, it is developmentally appropriate to describe temperature in relative terms; therefore, vocabulary words such as hot, warm, cool, cold, and warmer/cooler can be used to describe temperature. Students may also record temperature in degrees Fahrenheit and relate the number of degrees with descriptors such as hot, warm, cold, cool, and warmer/colder. Students also learn that weather events have causes that generate observable patterns over time, and that these patterns help weather scientists predict severe weather. Kindergarteners need opportunities to learn about severe weather, especially those types that tend to occur in the local region in which they live. By using a variety of media and technology, such as computers, radio, and television, and by reading grade-appropriate texts about weather and weather events, students can learn about types of severe weather that are common to their region. In addition, they come to understand that people depend on technology to help us predict and solve problems, and without it, our lives would be very different.In order to apply their learning, students need opportunities to ask questions about weather forecasting and how it can help us prepare for and respond to different types of severe weather. When kindergartners ask questions, make observations, gather weather information, and look for patterns of change in the weather, it prepares them to think about how to best prepare for and respond to local severe weather. As part of this unit of study, students are challenged to investigate how people prepare for and solve problems caused by severe weather. With adult guidance, students should define weather problems by asking questions, making observations, and gathering information about severe weather situations. Some questions students might want to consider include the following:* What kinds of severe weather events tend to occur in New Jersey (e.g., thunderstorms, hurricanes, flooding, snow storms)?
* What do people do in response to these types of severe weather events?
* What kinds of tools can people use to solve problems caused by severe weather conditions (e.g., umbrellas, sandbags, salt, gravel, shovels, snow blowers)?
* What other solutions might people use for problems caused by severe weather (e.g., closing schools and businesses; sending out emergency workers to restore utilities; sending out early warnings; stockpiling food, water, and other supplies; having a portable generator)?
* What kinds of problems would we face if we had a lot of rain in a short period of time?
* What problems might we have if our community experienced flooding?
* What kinds of problems might occur if strong winds caused damage (e.g., knocked over trees, damaged power lines, damaged homes and businesses)?
* What kinds of precautions do people take during a hurricane? A tornado? A Nor’easter? Why

**Mystery Science Suggested Lessons:** [Watching Weather Lessons (Weather & Seasons)](https://mysteryscience.com/watching/weather-seasons) Mystery 1: Weather Conditions and Tracking (*Have You Ever Watched A Storm?)*Mystery 2: Weather Conditions and Preparations *(How can you get ready for a big storm?)*Mystery 3: Seasons and Patterns (*What will the weather be like on your birthday?)*Mystery 4: Weather and Daily Patterns *(How do you know what to wear for the weather?)***BetterLessons Suggested Units:****What? Weather?** 1. [Describing Weather](https://betterlesson.com/lesson/635495/describing-weather-atmosphere-and-hydrosphere-best-friends-forweather?from=breadcrumb_lesson) *Students will label a diagram with correct weather terms.*
2. [Factors of Weather- Under Pressure!](https://betterlesson.com/lesson/635554/factors-of-weather-under-pressure?from=breadcrumb_lesson) *Students will conduct an experiment to demonstrate how air pressure and humidity work.*
3. [Describing Weather- Earth’s Revolution](https://betterlesson.com/lesson/635527/describing-weather-revolution-9-earth-s-revolution?from=breadcrumb_lesson) *Students will create a model to demonstrate the Earth's revolution around the Sun.*
4. [Describing Weather- Season Reasons](https://betterlesson.com/lesson/636177/describing-weather-season-reasons?from=breadcrumb_lesson) *Students will create a model to show the Earth's seasonal cycle.*
5. [Wacky Weather- Tracking Weather](https://betterlesson.com/lesson/635569/wacky-weather-olympic-track-star-tracking-weather?from=breadcrumb_lesson) *Students will create a graph to describe and track weather to observe its effects.*
6. [Exploring Weather- One! Two! Three Forcast!](https://betterlesson.com/lesson/636219/exploring-weather-one-two-three-forecast?from=breadcrumb_lesson) *Students will use weather data they collect to make a prediction.*
7. [Exploring Weather- One! Two! Three, Forcast! Part 2](https://betterlesson.com/lesson/639475/exploring-weather-one-two-three-forecast-part-2?from=breadcrumb_lesson) *Students will compare weather data to an actual forecast to compare results.*
8. [What? Weather?](https://betterlesson.com/lesson/636325/what-weather-assessment)  *Students will create a diagram that forecasts using appropriate elements of weather and Science vocabulary.*(Suggested Summative Assessment)

**Severe Weather- Wonderful Wizard**1. [Severe Weather- Thunder and Lightning- Not So Frightening!](https://betterlesson.com/lesson/636623/severe-weather-lightning-and-thunder-not-so-frightening-lightning?from=master_teacher_curriculum) *Students will conduct an experiment to create an electrical charge.*
2. [Severe Weather- Storm Alert!](https://betterlesson.com/lesson/636641/severe-weather-storm-alert?from=breadcrumb_lesson) *Students will learn and demonstrate safety measures to follow in a storm.*
3. [Severe Weather- Tornadoes- Dorothy Was Right!](https://betterlesson.com/lesson/636193/severe-weather-tornados-dorothy-was-right?from=breadcrumb_lesson) *Students will create a model to better understand and observe the structure of a tornado.*
4. [Severe Weather- Hurricanes- Tropical Storms Run Amok!](https://betterlesson.com/lesson/636813/severe-weather-hurricanes-tropical-storms-run-amok?from=breadcrumb_lesson) *Students will be able to explain the structure of a hurricane by building a model.*
5. [Severe Weather- Blizzards- Let it Snow!](https://betterlesson.com/lesson/636967/severe-weather-blizzards-let-it-snow?from=breadcrumb_lesson) *Students will explain how snowflakes are formed to cause blizzards by sketching different crystals.*
6. [Severe Weather- Snowflake Formation- Blizzard of Oz!](https://betterlesson.com/lesson/637004/severe-weather-snowflake-formation-blizzard-of-oz?from=breadcrumb_lesson) *Students will observe how crystals form by conducting an investigation with 3 different kinds of salt.*
7. [Severe Weather Assessment- Separate and Equal!](https://betterlesson.com/lesson/637236/severe-weather-assessment-separate-and-equal?from=breadcrumb_lesson) *Students will describe 4 main types of weather by creating a diagram.*(Suggested Summative Assessment)
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| **Science and Engineering Practices** | **Disciplinary Core Ideas** | **Crosscutting concepts** |
| [**Analyzing and Interpreting Data**](http://www.nap.edu/openbook.php?record_id=13165&page=61)* [Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.](http://www.nap.edu/openbook.php?record_id=13165&page=61) (K-ESS2-1)

[**Asking Questions and Defining Problems**](http://www.nap.edu/openbook.php?record_id=13165&page=54)* [Ask questions based on observations to find more information about the designed world.](http://www.nap.edu/openbook.php?record_id=13165&page=54) (K-ESS3-2)
* [Ask questions based on observations to find more information about the natural and/or designed world(s).](http://www.nap.edu/openbook.php?record_id=13165&page=54)
* [Define a simple problem that can be solved through the development of a new or improved object or tool.](http://www.nap.edu/openbook.php?record_id=13165&page=54) (K-2-ETS1-1)

[**Obtaining, Evaluating, and Communicating Information**](http://www.nap.edu/openbook.php?record_id=13165&page=74)* [Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.](http://www.nap.edu/openbook.php?record_id=13165&page=74) (K-ESS3-2)
 | [**ESS2.D: Weather and Climate**](http://www.nap.edu/openbook.php?record_id=13165&page=186)* [Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.](http://www.nap.edu/openbook.php?record_id=13165&page=186) (K-ESS2-1)

[**ESS3.B: Natural Hazards**](http://www.nap.edu/openbook.php?record_id=13165&page=192)* [Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events.](http://www.nap.edu/openbook.php?record_id=13165&page=192) (K-ESS3-2)

[**ETS1.A: Defining and Delimiting an Engineering Problem**](http://www.nap.edu/openbook.php?record_id=13165&page=204)* [A situation that people want to change or create can be approached as a problem to be solved through engineering.](http://www.nap.edu/openbook.php?record_id=13165&page=204) (K-2-ETS1-1)
* [Asking questions, making observations, and gathering information are helpful in thinking about problems.](http://www.nap.edu/openbook.php?record_id=13165&page=204) (K-2-ETS1-1)
* [Before beginning to design a solution, it is important to clearly understand the problem.](http://www.nap.edu/openbook.php?record_id=13165&page=204) (K-2-ETS1-1)
 | [**Analyzing and Interpreting Data**](http://www.nap.edu/openbook.php?record_id=13165&page=61)* [Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.](http://www.nap.edu/openbook.php?record_id=13165&page=61) (K-ESS2-1)

[**Asking Questions and Defining Problems**](http://www.nap.edu/openbook.php?record_id=13165&page=54)* [Ask questions based on observations to find more information about the designed world.](http://www.nap.edu/openbook.php?record_id=13165&page=54) (K-ESS3-2)
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* [Define a simple problem that can be solved through the development of a new or improved object or tool.](http://www.nap.edu/openbook.php?record_id=13165&page=54) (K-2-ETS1-1)

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| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| What patterns do you observe in our Weather Chart? * Have we had more sunny days or cloudy days? What is your evidence?
* When was it warmest this week? What is your evidence?
* Is this week sunnier or cloudier than last week? What is your evidence?
* Has the weather gotten warmer or cooler over the past two weeks? What is your evidence?
* Observe patterns in events generated by cause-and-effect relationships.
* Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.
* Ask questions based on observations to find more information about the designed world.
* Ask questions to obtain information about the purpose of weather forecasting to prepare for and respond to severe weather. (Emphasis is on local forms of severe weather.)
* Define a simple problem that can be solved through the development of a new or improved object or tool.
* Ask questions, make observations, and gather information about a situation people want to change in order to define a simple problem that can be solved through the development of a new or improved object or tool.
 | *Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.***Mystery Science Assessments *(all resources are accessible on google drive)***[Mystery 1: Weather Conditions and Tracking](https://docs.google.com/presentation/d/1_hVQ7q1iBM89qf3qoHmgQ8zge1AlGkfF-evQg6aq51g/edit?usp=sharing) [Read-Along Mystery 2: Weather Conditions and Preparation](https://docs.google.com/presentation/d/151v5FCWZYJ0E8fdY82em7TeJfnvtq3mAPo9OTZZqY2c/edit?usp=sharing) [Mystery 3: Seasons and Patterns](https://docs.google.com/presentation/d/1PFzLeesj-8UBETXnVoVraT0res8Mq7feOGf297fc158/edit?usp=sharing) [Read-Along Mystery 4: Weather and Daily Patterns](https://docs.google.com/presentation/d/117t4UGeUAIovgPrP-q2y29ENWvIFF-Ghs1jhu4QKVOc/edit?usp=sharing) |
| **Alternative Assessments** |
| **Evaluative Criteria** | **Assessment Evidence** |
| **Suggested Performance Rubric:** Use the following or similar rubric to evaluate students’ performance on lesson assessments:

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| **4 - Innovating:** | Advanced understanding and application of the standard |
| **3 - Applying:** | Consistently applies skills independently |
| **2 - Developing:** | Progressing towards independent application of skills |
| **1 - Beginning:** | Early stages of development, need assistance |

 | Suggested Performance Tasks include but are not limited to:**Performance Task: STEAM-ABLES-**Q: How do clouds make snow? A: Clouds are made of teeny-tiny water droplets. If the temperature is cold enough, these teeny tiny droplets freeze and turn into teeny-tiny ice crystals. When these crystals bump into each other, they stick together to make snowflakes. And if enough crystals stick together, the flakes are heavy enough to fall to the ground as snow! ***Which snowball will melt faster?*** Melting Experiment**:** Try this easy experiment to help kids see that ice (and snow!) melts when it gets warm. First, remind kids what snow is made of: tiny pieces of ice. Then place handfuls of crushed ice (or fresh snow if available!) in several plastic bags. (If crushed ice is unavailable, ice cubes will work.) Make sure the bags are sealed tightly. Now work with kids to decide a few different places to put the bags. For instance, you might place one on a sunny windowsill, one outside, one on a shelf, and one in the refrigerator. Have them predict: Which bag of ice will melt faster? Why? Keep tabs on all your bags of ice and see which are melting faster or slower. As the ice melts, what does it turn into? (water) As each bag finishes melting, write on chart paper the place you kept it. You should have a list that shows the order in which the bags’ ice melted, from first to last. What can kids tell from the order? Lead them to see that the list goes from warmest place to coldest place. Like ice, snow melts faster the warmer it gets outside. That’s why it’s mostly gone by spring |
| **District/School Texts** | **District/School Supplementary Resources** |
| Haddon Heights - Unit Kits for Science Labs and ReferencesLawnside - Houghton Mifflin Harcourt : Science FusionMerchantville- Exploring Science (National Geographic Learning)Barrington- Journeys (ELA Connection Resources)  | [Printable Weather Chart](https://docs.google.com/document/d/1-adXOipX10s0YNnfocO3LPOfSrpQ0BVS-sVNL13KSYo/edit?usp=sharing)[Weather Patterns](http://sciencenetlinks.com/lessons/weather-1-weather-patterns/): This lesson is the first in a two-part series on the weather. The study of the weather in these early years is important because it can help students understand that some events in nature have a repeating pattern. It also is important for students to study the earth repeatedly because they take years to acquire the knowledge that they need to complete the picture. The full picture requires the introduction of such concepts as temperature, the water cycle, and other related concepts. In the second activity, What's the Season, students identify the seasonal patterns in temperature and precipitation.[Weather Walks](https://www.uen.org/lessonplan/view/10665): Students learn about weather by taking walks during various weather conditions over the course of time. Walks take place during sunny, rainy, windy, or snowy conditions. The lesson is divided into four sections with activities assigned to each of the weather conditions being observed. Suggested activities include appropriate investigations to help students observe and describe weather phenomenon through first hand experiences.**Books:***It Looked Like Spilt Milk* by Jeremy Brunaccioni (clouds) [*https://www.scholastic.com/teachers/lesson-plans/teaching-content/it-looked-spilt-milk-lesson-plan/*](https://www.scholastic.com/teachers/lesson-plans/teaching-content/it-looked-spilt-milk-lesson-plan/)**Read Aloud Books:***Gilberto and the Wind* by Marie Hall Ets**ELA Connections (Journeys Resource):**Unit 3 Lesson 15 *What a Beautiful Sky? (weather/clouds)*Unit 3 Lesson 11 *Jump into January (seasons)*Unit 3 Lesson 12 *Snow (weather/animals)***-Scholastic News****-Brain POP** **-Read Works** |
| [**Interdisciplinary Connections**](http://www.state.nj.us/education/cccs/)  |
| **ELA**Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-ESS2-1) **W.K.7** [With prompting and support, ask and answer questions about key details in a text. (K-ESS3-2)](http://www.corestandards.org/ELA-Literacy/RI/K)[**RI.K.1**](http://www.corestandards.org/ELA-Literacy/RI/K)[Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2)](http://www.corestandards.org/ELA-Literacy/SL/K)[**SL.K.3**](http://www.corestandards.org/ELA-Literacy/SL/K)Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1) **RI.2.1** With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1) **W.2.6** Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1) **W.2.8** | **Math**Reason abstractly and quantitatively. (K-ESS2-1),(K-2-ETS1-1) **MP.2** Model with mathematics. (K-ESS2-1),(K-ESS3-2),(K-2-ETS1-1) **MP.4**Use appropriate tools strategically. (K-2-ETS1-1) **MP.5**[Counting and Cardinality (K-ESS3-2)](http://www.corestandards.org/Math/Content/K/CC)[**K.CC**](http://www.corestandards.org/Math/Content/K/CC)Know number names and the count sequence. (K-ESS2-1) **K.CC.A** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1) **K.MD.A.1** Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1) **K.MD.B.3** | **Technology*** [Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world.](http://www.nap.edu/openbook.php?record_id=13165&page=74) (K-ESS3-2)

[**Interdependence of Science, Engineering, and Technology**](http://www.nap.edu/openbook.php?record_id=13165&page=210)* [People encounter questions about the natural world every day.](http://www.nap.edu/openbook.php?record_id=13165&page=210) (K-ESS3-2)

[**Influence of Engineering, Technology, and Science on Society and the Natural World**](http://www.nap.edu/openbook.php?record_id=13165&page=212)* [People depend on various technologies in their lives; human life would be very different without technology.](http://www.nap.edu/openbook.php?record_id=13165&page=212) (K-2-ETS1-1)
 |
| **21st Century Skills/Career Education**CRP2. Apply appropriate academic and technical skillsCRP5. Consider the environmental, social and economic impacts of decisions.  |  |  |
| **Modifications and Accommodations** |
| **Special Education Students**Small groupDirect instructionrestate/rephrasegraphic organizersmodified assignmentschunkingleveled textintentional groupingread textextended timebreaksTeacher records/ student dictates | **English Language Learners**Labelsword banksvisualsstudent friendly definitionsextended timechunkingintentional grouping | **Students at Risk of School Failure**leveled text graphic organizersmodified assignmentskinesthetic activitiesrestate/rephrasechunkingintentional grouping |
| **Gifted and Talented**extension projectleveled textleadership rolesintentional groupingTargeted learning from assessment | **Students with 504 Plans**breakschunkingpreferential seatingvisual remindersrestate/rephrasecheck-in/check-out systemvisual timeTeacher records/ student dictates |  |
| **Unit Duration: 10 Days and then ongoing** |

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| **STANDARD:** **K-PS2 - Motion and Stability: Forces and Interactions****K-2 ETS1 - Engineering** |
| **Unit 2: Pushes and Pulls** |
| **ESTABLISHED GOALS (INDICATOR #)** | **TRANSFER (How will this apply to their lives?)** |
| **K-PS2-1 - Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.****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.****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.** | *Students will be able to independently use their knowledge to…** Perform simple tests to determine strength of push and pull.
* determine the success or failure of a design.
* Compare objects for strength or weakness.
 |
| **MEANING** |
| UNDERSTANDINGS:* Simple tests can be designed to gather evidence to support or refute student ideas about causes.
* Pushes and pulls can have different strengths and directions.
* Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
* A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions.
* Because there is always more than one possible solution to a problem, it is useful to compare and test designs.
 | ESSENTIAL QUESTIONS:* *Why do scientists like to play soccer?*
* *How can you design a simple way to change the speed or direction of an object using a push or pull from another object?*
 |
| **Unit 2: Grade K - Suggested Lessons** |
| In this unit of study, students plan and carry out investigations in order to understand the effects of different strengths and different directions of pushes and pulls on the motion of an object. Students will also engage in a portion of the ***engineering design process*** to determine whether a design solution works as intended to change the speed or direction of an object.Scientists often design simple tests in order to gather evidence that can be used to understand cause-and-effect relationships. In this unit’s progression of learning, kindergarteners need adult guidance to collaboratively plan and conduct simple investigations to discover and compare the effects of pushes and pulls on the motion of an object. Students will need opportunities to push and pull a variety of objects, such as balls, toy cars, pull toys, cans, tops, and boxes. Students should push/pull these objects first with varying strengths, and then in a variety of directions. They should also explore the effects of pushing objects into one another, as well as into walls and other stationary objects. Students should record their observations using pictures and words, and should participate in class discussions on the effects of varying the strength or direction of a push or pull on an object.As students engage in these types of simple force and motion investigations, they will learn that:* Pushes and pulls can have different strengths and directions.
* Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
* When objects touch or collide, the object’s motion can be changed.
* The force of the push or pull will make things speed up or slow down more quickly.

To enhance students’ experiences, teachers can schedule time for students to investigate these force and motion concepts using playground equipment, such as swings, seesaws, and slides. Teachers can also use trade books and multimedia resources to enrich students’ understanding. As students participate in discussions, they should be encouraged to ask questions, share observations, and describe cause-and-effect relationships between forces (pushes and pulls) and the motion of objects.As students come to understand the force and motion concepts outlined above, they should engage in the ***engineering design process*** as follows.* Students are challenged to design a simple way to change the speed or direction of an object using a push or pull from another object.
* As a class, students determine what the design should be able to do (criteria). For example:
* An object should move a second object a certain distance;
* An object should move a second object so that the second object follows a particular path;
* An object should change the direction of the motion of a second object; and/or
* An object should knock down other specified objects.
* Students determine the objects that will move/be moved (balls, ramps, blocks, poker chips) and the types of structures (ramps or barriers) and materials (rubber bands, paper tubes, cardboard, foam, wooden blocks) that can be used to meet this challenge.
* Groups of students then develop a simple drawing or diagram and use given materials to build their design. Groups should be given a predetermined amount of time to draw and build their designs.
* Groups share their designs with the class, using their drawings or diagrams, and then test their designs.
* Students make and use observations to determine which of the designs worked as intended, based on the criteria determined by the class.

While engaging in this process, students should use evidence from their observations to describe how forces (pushes and pulls) cause changes in the speed or direction of an object.In this unit of study, students learn that problem situations can be solved through engineering, and that because there is always more than one possible solution to a problem, it is useful to compare and test designs. Students will use what they have learned about the effect of pushes and pulls of varying strength and direction on the motion of an object to determine whether a design solution works as intended. This process is outlined in greater detail in the previous section.Mystery Science Suggested Lessons: [Force Olympics: Forces, Machines and Engineering](https://mysteryscience.com/pushes/forces-machines-engineering) Mystery 1: Pushes, Pulls, & “Work Words" (*What’s the Biggest Excavator?)*Mystery 2: Pushes, Pulls, & “Work Words” *(Why do builders need so many big machines?)*Mystery 3: Strength & Direction of Force (*How can you knock down a wall made of concrete?)* Mystery 4: Strength and Direction of Force *(How can you knock down the most bowling pins?)*Mystery 5: Forces and Engineering *(How can we protect a mountain town from falling rocks?)*Mystery 6: Forces and Engineering *(How could you invent a trap?)***BetterLessons Suggested Unit:**1. [Introduction to Force and Motion](https://betterlesson.com/lesson/638992/introduction-to-force-and-motion?from=breadcrumb_lesson) *Students will be match pictures with definitions as pre-assessment activity for this unit.*
2. [Force: Push or Pull](https://betterlesson.com/lesson/638993/force-push-or-pull?from=breadcrumb_lesson) *Students learn that a force makes an object move or change direction by pushing or pulling something.*
3. [Motion](https://betterlesson.com/lesson/639006/motion?from=breadcrumb_lesson) *Students will observe motion with different objects by participating in a series of investigations.*
4. [Energy and Momentum](https://betterlesson.com/lesson/639007/energy-and-momentum?from=breadcrumb_lesson) *Students learn that energy and momentum make objects or people move faster or slower by testing the speed of marbles on ramps.*
5. [Friction](https://betterlesson.com/lesson/639008/friction?from=breadcrumb_lesson) *Students explore that friction causes objects to move slower by testing toy cars on different surfaces.*
 |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| *Students who understand the concepts are able to:** With guidance, design simple tests to gather evidence to support or refute ideas about cause-and-effect relationships.
* With guidance, plan and conduct an investigation in collaboration with peers.
* With guidance, collaboratively plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. *(Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include noncontact pushes or pulls such as those produced by magnets.)* Some examples of pushes and pulls on the motion of an object could include:
* A string attached to an object being pulled.
* A person pushing an object.
* A person stopping a rolling ball.
* Two objects colliding and pushing on each other.

*Students who understand the concepts are able to:** With guidance, design simple tests to gather evidence to support or refute ideas about cause-and-effect relationships.
* Analyze data from tests of an object or tool to determine if it works as intended.
* Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
* Analyze data to determine whether a design solution works as intended to change the speed or direction of an object with a push or a pull.
* Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects.
* Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.
 | *Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.***Mystery Science Assessments*(all resources are accessible on google drive)***[Mystery 1: Pushes, Pulls and "Work Words"](https://docs.google.com/presentation/d/1GVvztVJSE5pltGS_Z-mm-s-plqhOdI5Nv2aFBQhC5I4/edit?usp=sharing)[Read-Along Mystery 2: Pushes, Pulls and "Work Words"](https://docs.google.com/presentation/d/1VszJPSqdGdI0j_3_Qsbk63GGyy67nM8_wJI6U6cmJKA/edit?usp=sharing)[Mystery 3: Strength and Direction of Force](https://docs.google.com/presentation/d/1p-DCyVgzja6VvRoEhFHisV8Cs9aBpC2kKruk17pwNiU/edit?usp=sharing)[Read-Along Mystery 4: Strength and Direction of Force](https://docs.google.com/presentation/d/1LIED9zuOgCQd76k6Zp4r_vj9gdZJZ0Km-Cfdsuptmfo/edit?usp=sharing)[Mystery 5: Forces and Engineering](https://docs.google.com/presentation/d/1PBvqobtUuYuccURwxOKT6ASfN90JaulJf58z-hfLVGs/edit?usp=sharing)[Read-Along Mystery 6: Forces and Engineering](https://docs.google.com/presentation/d/1NuNla1KNc0DHH3euvAeGE1a8XEaHeA6LN3XnDWxa-0o/edit?usp=sharing) |
| **Alternative Assessments** |
| **Evaluative Criteria** | **Assessment Evidence** |
| **Suggested Performance Rubric:** Use the following or similar rubric to evaluate students’ performance on lesson assessments:

|  |  |
| --- | --- |
| **4 - Innovating:** | Advanced understanding and application of the standard |
| **3 - Applying:** | Consistently applies skills independently |
| **2 - Developing:** | Progressing towards independent application of skills |
| **1 - Beginning:** | Early stages of development, need assistance |

 | Suggested Performance Tasks but not limited to:**Performance Task: STEAM:** [**Sinking and Floating Along**](http://betterlesson.com/lesson/636834/sinking-and-floating-along)**Essential Question-**How can students plan and construct items that sink and float and identify what characteristics the objects have in common?**Description of Task-**Students will determine the properties of objects that sink and float by creating and placing variety of objects in a tub of water to see if they sink or float.**Materials/Resources-***Suggested* materials:* 6 one quart clear containers
* 1 water pitcher
* Pond rocks
* Feathers
* Empty plastic Easter eggs
* Toothpicks
* Pieces of plastic drinking straws
* Matchbox cars
* 2x2 pieces of index cards
* Small styrofoam cups
* Small Party pumpkin treat containers
* A variety of other random items
* Student chosen materials
* Science journals
* Recording sheet

(record sheet, videos, and full lesson)[www.Learn360.com](http://www.learn360.com)(How do boats with heavy loads float on water?)Related texts**Assessment-**Students who understand the concepts are able to:* Design simple tests to gather evidence to support or refute ideas about cause and effect relationships
* Plan and conduct an investigation in collaboration with peers
* Analyze data from tests of an object or tool to determine if it works as intended
* Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs

RubricObservationsScience JournalsEnd Product |
| **District/School Texts** | **District/School Supplementary Resources** |
| Haddon Heights - Unit Kits for Science Labs and ReferencesLawnside - Houghton Mifflin Harcourt : Science FusionMerchantville- Exploring Science (National Geographic Learning)Barrington- Journeys (ELA Connection Resources)  | **-ELA Connections (Journeys):*** Unit 2 Lesson 9 *What Do Wheel Do All Day?* (machines and motion)
* Unit 6 Lesson 28 *Little Engine that Could*

**-Scholastic News****-Brain POP** **-Read Works** |
| [**Interdisciplinary Connections**](http://www.state.nj.us/education/cccs/)  |
| **ELA**[With prompting and support, ask and answer questions about key details in a text. (K-PS2-2)](http://www.corestandards.org/ELA-Literacy/RI/K) [**RI.K.1**](http://www.corestandards.org/ELA-Literacy/RI/K)[Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS2-1)](http://www.corestandards.org/ELA-Literacy/W/K) [**W.K.7**](http://www.corestandards.org/ELA-Literacy/W/K)[Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2)](http://www.corestandards.org/ELA-Literacy/SL/K) [**SL.K.3**](http://www.corestandards.org/ELA-Literacy/SL/K) | **Mathematics**[Reason abstractly and quantitatively. (K-PS2-1)](http://www.corestandards.org/Math/Practice/MP2), ( K-2-ETS1-1),(K-2-ETS1-3) [**MP.2**](http://www.corestandards.org/Math/Practice/MP2)[Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3)](http://www.corestandards.org/Math/Practice/MP2) [**MP.4**](http://www.corestandards.org/Math/Practice/MP4)[Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3)](http://www.corestandards.org/Math/Practice/MP5) [**MP.5**](http://www.corestandards.org/Math/Practice/MP5)[Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1)](http://www.corestandards.org/Math/Content/K/MD) [**K.MD.A.1**](http://www.corestandards.org/Math/Content/K/MD)[Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K-PS2-1)](http://www.corestandards.org/Math/Content/K/MD) [**K.MD.A.2**](http://www.corestandards.org/Math/Content/K/MD) | **Technology**8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss |
| **21st Century Skills/Career Education**CRP2. Apply appropriate academic and technical skills. |  |  |
| **Modifications and Accommodations** |
| **Special Education Students**Small groupDirect instructionrestate/rephrasegraphic organizersmodified assignmentschunkingleveled textintentional groupingread textextended timebreaksTeacher records/ student dictates | **English Language Learners**Labelsword banksvisualsstudent friendly definitionsextended timechunkingintentional grouping | **Students at Risk of School Failure**leveled text graphic organizersmodified assignmentskinesthetic activitiesrestate/rephrasechunkingintentional grouping |
| **Gifted and Talented**extension projectleveled textleadership rolesintentional groupingTargeted learning from assessment | **Students with 504 Plans**breakschunkingpreferential seatingvisual remindersrestate/rephrasecheck-in/check-out systemvisual timeTeacher records/ student dictates |  |
| **Unit Duration:** 15 Days  |

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| **STANDARD:** **K-PS3 - Energy****K-2ETS1 - Engineering Design** |
| **Unit 3:Effects of the Sun** |
| **ESTABLISHED GOALS (INDICATOR #)** | **TRANSFER (How will this apply to their lives?)** |
| **K-PS3-1 Make observations to determine the effect of sunlight on Earth’s surface.****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*.*****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** | *Students will be able to independently use their knowledge to…** Describe the sun’s effects on the Earth’s surface.
* Sketch observations based on the sun’s patterns.
* Create a structure that will reduce the sun’s effect on an object / Earth surface.
 |
| **MEANING** |
| UNDERSTANDINGS:* Events have causes that generate observable patterns.
* The shape and stability of structures of natural and designed objects are related to their function(s).
* Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people.
* Because there is always more than one possible solution to a problem, it is useful to compare and test designs.
* Sunlight warms the Earth's surface.
 | ESSENTIAL QUESTIONS:* *How does sunlight affect the playground?*
* *Imagine that we have been asked to design a new playground. How would we keep the sand, soil, rocks, and water found on the playground cool during the summer?*
 |
| **Unit 3: Grade K - Suggested Lessons** |
| In this unit of study, students investigate the effects of the sun on the surface of the Earth. Throughout the unit, students make observations in order to describe patterns of change. With adult support, they design and build a structure that will reduce the warming effect of sunlight, and then conduct tests to determine if the structure works as intended.Scientists use different ways to study the world. In this unit’s progression of learning, students work like scientists to investigate the warming effect of sunlight on the surface of the Earth. They will conduct simple investigations in order to make observations and collect data that can be used to make comparisons. Students should test a variety of materials that are found naturally on the surface of the Earth, including sand, soil, rocks, and water. Samples of each of these materials can be placed on two separate paper plates or shallow plastic containers; one container can be placed in direct sunlight, and the other can be placed out of direct sunlight. After a period of time, students should compare the relative temperature of each. Students should record their observations, then analyze and compare the data to determine if there is a pattern. They should draw the conclusion that the sun has the same warming effect on all the materials found on the surface of the Earth.As students come to understand that the sun warms the surface of the Earth, they should engage in the engineering design process as follows:* Students are challenged to design and build a structure that will reduce the warming effects of the sun.
* Students brainstorm a list of objects that reduce the warming effects of the sun (e.g., shade trees, umbrellas, large hats, canopies).
* As a class, students determine what the design should be able to do (criteria). For example:
* The structure must reduce the warming effects of the sun.
* The structure should be built using materials provided by the teacher.
* The structure should be easy to carry and fit through the doorway of the classroom.
* Groups of students then use simple drawings or diagrams to design a structure, and use given tools and materials to build their design. Groups should be given a predetermined amount of time to draw and build their designs.
* Groups share their designs with the class, using their drawings or diagrams, and then test their designs outside. (Groups can place their structures in a sunny area, then compare the relative temperature of the ground under the structure and the ground in direct sunlight.).
* Students make and use observations to determine if the designs worked as intended, then compare the strengths and weaknesses of how each design performed.

While engaging in this process, students should use evidence from their observations to describe how their structures reduced the warming effect of sunlight.Through this process, students learn that the shape and stability of structures of designed objects are related to their function. They will use tools and materials to design and build their structures. Because there is always more than one possible solution to a problem, students will test and compare their designs, then analyze data to determine if their structures work as intended.**Mystery Science Suggested Lessons:**[**Weather Watching- Weather and Seasons**](https://mysteryscience.com/watching/weather-seasons)Mystery 5: Sun, Heat, and Engineering *(How could you warm up a frozen playground?)*Mystery 6: Sun and Heat *(How could you walk barefoot across hot pavement without burning your feet?)***BetterLessons Suggested Unit:**[Some Sun!](https://betterlesson.com/lesson/640807/some-sun-assessment)  (Can be used as pre and post assessment)1. [Some Sun! Sun or Shade](https://betterlesson.com/lesson/640772/some-sun-sun-or-shade) *Students will investigate areas where plants can grow best.*
2. [Some Sun! Too Much Sun](https://betterlesson.com/lesson/640806/some-sun-too-much-sun) *Students will design and build a structure to protect plants from effects of sun.*
3. [Exploring the Sun](https://betterlesson.com/lesson/640047/exploring-the-sun) *Students will be able to describe how the sun is a source of heat by completing an exploratory investigation.*
4. [Some Sun! Evaporation Station](https://betterlesson.com/lesson/641916/some-sun-evaporation-station) *Students will observe and record the effects of evaporation.*
 |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| *Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards*.*Students who understand the concepts are able to:** Observe patterns in events generated by cause-and-effect relationships.
* Make observations (firsthand or from media) to collect data that can be used to make comparisons.
* Make observations to determine the effect of sunlight on Earth’s surface. (Assessment of temperature is limited to relative measures such as warmer/cooler.)
* Examples of Earth’s surface could include:
* Sand
* Soil
* Rocks
* Water
* Observe patterns in events generated by cause-and-effect relationships.
* Describe how the shape and stability of structures are related to their function.
* Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.
* Use tools and materials to design and build a structure (e.g., umbrellas, canopies, tents) that will reduce the warming effect of sunlight on an area.
* Develop a simple model based on evidence to represent a proposed object or tool.
* 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.
* Analyze data from tests of an object or tool to determine if it works as intended.
* Analyze data from tests of two objects designed to solve the same problem to compare the strengths
 | *Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*[Some Sun!](https://betterlesson.com/lesson/640807/some-sun-assessment)  (Can be used as pre and post assessment)**Mystery Science Assessments *(all resources are accessible on google drive)***[Mystery 5: Sun, Heat and Engineering](https://docs.google.com/presentation/d/1iLWCyG2XcwjW7nypQ5x5jhJBK3uzCGyR_CyxTlIxuS0/edit?usp=sharing)[Read-Along Mystery 6: Sun and Heat](https://docs.google.com/presentation/d/1LrP0xuTUlSDaYNpkqM9tHWf4h39qcGwrRkrlcQNqglk/edit?usp=sharing) |
| **Alternative Assessments** |
| **Evaluative Criteria** | **Assessment Evidence** |
| **Suggested Performance Rubric:** Use the following or similar rubric to evaluate students’ performance on lesson assessments:

|  |  |
| --- | --- |
| **4 - Innovating:** | Advanced understanding and application of the standard |
| **3 - Applying:** | Consistently applies skills independently |
| **2 - Developing:** | Progressing towards independent application of skills |
| **1 - Beginning:** | Early stages of development, need assistance |

 | Suggested Performance Tasks:**Performance Task: STEAM:** [“A Place in the Shade”](http://betterlesson.com/lesson/644795/a-place-in-the-shade-an-engineering-challenge)**Essential Question-**How can students participate in the engineering and design process in this challenge in which they try to keep an ice cube from melting?**Description of Task-**Students will demonstrate knowledge of the engineering and design process by creating a structure that provides shade.**Materials/Resources-***Suggested* materials:* Paper for sketching plans
* Black construction paper (9x12)
* White construction paper (9x12)
* Popsicle sticks
* Tongue depressors
* Masking tape
* One ice cube per student
* Plastic bags
* Timer
* Student chosen materials
* Science journals

[www.Learn360.com](http://www.learn360.com)(Sun and its Effects)Related texts**Assessments-**Students who understand the concepts are able to:* Observe patterns in events generated by cause and effect relationships
* Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem
* Use tools and materials to design and build a structure (e.g. umbrellas, canopies, tents) that will reduce the warming effect of sunlight on an area

RubricObservationsScience JournalsEnd Product |
| **District/School Texts** | **District/School Supplementary Resources** |
| Haddon Heights - Unit Kits for Science Labs and ReferencesLawnside - Houghton Mifflin Harcourt : Science FusionMerchantville- Exploring Science (National Geographic Learning)Barrington- Journeys (ELA Connection Resources)  | [Casting Shadows Across Literacy and Science](http://www.readwritethink.org/classroom-resources/lesson-plans/casting-shadows-across-literacy-1016.html?tab=4): This lesson introduces shadows by taking students on a shadow walk. Ideally this should be done on a sunny day in the schoolyard or neighborhood, but it can be a simple walk around the classroom. [A Big Star](https://www.readworks.org/article/A-Big-Star/c16226a0-452a-4e8e-bdf3-702e84ecf4c7#!articleTab:content/): This reading passage that explains what the sun is and that it provides heat to the Earth. This activity comes with comprehension and critical thinking questions. [The Warmth of the Sun](http://sciencenetlinks.com/lessons/the-warmth-of-the-sun/): This lesson helps students broaden their understanding of the sun, particularly its critical role in warming the land, air, and water around us.[Cooler in the Shadows](http://sciencenetlinks.com/lessons/cooler-in-the-shadows/): This lesson includes several activities where students observe, explore, and analyze shadows. Students will make inferences about the cause of shadows, The lesson is linked to NASA's MESSENGER spacecraft in its voyage to and around Mercury. This lesson is designed to last 4 or more days. There are four different activities within the lesson. The teacher will need to gather some materials prior to beginning the lesson.[Shadow Smile! - Part 6 | Sid the Science Kid:](http://www.pbslearningmedia.org/resource/ab608973-106b-40d7-922f-db1e9ccdefc9/shadow-smile-part-6-sid-the-science-kid/) In this song, Miss Susie teaches the class about shadows and the necessary shade they provide for people and animals in the heat! Learn how shadows are a result of an object getting in the way of the path of the sun and that the shadow it casts over the ground provides shade.**-Scholastic News****-Brain POP** **-Read Works** |
| [**Interdisciplinary Connections**](http://www.state.nj.us/education/cccs/)  |
| **ELA**Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1),(K-PS3-2) **W.K.7** Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K- PS3-1) **K.MD.A.2**Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1) **RI.2.1** With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1),(K-2-ETS1-3) **W.2.6** Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1),(K-2-ETS1-3) **W.2.8** Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2) **SL.2.5**  | **Math**Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K-PS3-2) **K.MD.A.2**Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3) **MP.2** Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3) MP.4 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3) MP.5 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1),(K-2-ETS1-3) **2.MD.D.10** | **Technology**8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss |
| **21st Century Skills/Career Education**CRP2. Apply appropriate academic and technical skills. |  |  |
| **Modifications and Accommodations** |
| **Special Education Students**Small groupDirect instructionrestate/rephrasegraphic organizersmodified assignmentschunkingleveled textintentional groupingread textextended timebreaksTeacher records/ student dictates | **English Language Learners**Labelsword banksvisualsstudent friendly definitionsextended timechunkingintentional grouping | **Students at Risk of School Failure**leveled text graphic organizersmodified assignmentskinesthetic activitiesrestate/rephrasechunkingintentional grouping |
| **Gifted and Talented**extension projectleveled textleadership rolesintentional groupingTargeted learning from assessment | **Students with 504 Plans**breakschunkingpreferential seatingvisual remindersrestate/rephrasecheck-in/check-out systemvisual timeTeacher records/ student dictates |  |
| **Unit Duration:** 15 days |

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| --- |
| **STANDARD:** **K-LS1- From Molecules to Organisms: Structures and Processes****K-ESS3- Earth and Human Activity****K-ESS2- Earth’s System** |
| **Unit 4: Basic Needs of Living Things** |
| **ESTABLISHED GOALS (INDICATOR #)** | **TRANSFER (How will this apply to their lives?)** |
| **K-LS1-1- Use observations to describe patterns of what plants and animals (including humans) need to survive.****K-ESS3-1- Use a model to represent the relationship between** **the needs of different plants and animals (including humans)** **and the places they live.****K-ESS2-2-** **Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.** | *Students will be able to independently use their knowledge to…** To describe patterns of what plants and animals need to survive.
* To determine the relationship between the needs of plants and animals and where they live.
* To show evidence of how plants and animals can change the environment to meet their needs.
 |
| **MEANING** |
| UNDERSTANDINGS:* Scientists look for patterns and order when making observations about the world.
* Patterns in the natural and human-designed world can be observed and used as evidence.
* Plants need water and light to live and grow.
* Systems in the natural and designed world have parts that work together.
* Living things need water, air, and resources from the land, and they live in places that have the things they need.
* Systems in the natural and designed world have parts that work together.
* Plants can change their environments.
* Things that people do to live comfortably can affect the world around them. People can make choices that reduce their impacts on the land, water, air, and other living things. *(The focus of this unit is on plants and animals. Even though this particular concept is part of K-ESS2-2, it will not be addressed in this unit of study, but will instead be addressed in Unit 5, Humans.)*
 | ESSENTIAL QUESTIONS:* *What do plants need to live and grow?*
* *What is the relationship between what plants need and where they live?*
* *How can plants change their habitat?*
 |
| **Unit 4: Life Science- Lessons** |
| “Kid Questions”* *How can you tell if something is alive?*
* *What do living things need to survive?*
* *Where do organisms live and why do they live there?*

The unit should begin with observable phenomena. The purpose of presenting phenomena to students is to start them thinking and wondering about what they observe. After students have observed the event, they can work individually, with partners, or in a small group to develop questions about what they saw. The questions will lead them into investigational opportunities throughout the unit that will help them answer their questions. The questions students share about this unit will be used to guide them in identifying patterns of what plants and animals need to survive. For example, a pattern may include the types of food that specific organisms eat or that animals consume food but plants do not. Furthermore, students’ questions and investigations will also guide them in developing models that reflect their understanding of the inter-relationship between an organism and its environment. * Prior to starting the unit, display pictures of living and non-living things. Direct students to sort the pictures into two groups: living and non-living. Ask students to explain how they decided which pictures represented living things and which represented non-living things.
* Watch the PBS video “[Is It Alive?](http://www.pbslearningmedia.org/resource/tdc02.sci.life.colt.alive/is-it-alive/)” Stop after each picture and ask students if it’s alive or not. Ask them to explain how they can tell. (This activity will also provide an opportunity to pre-assess students’ understandings and/or misconceptions. It will also provide an opportunity for students to think about what having life means.)
* Watch the TeacherTube video “[Living or Non-Living?”](http://www.teachertube.com/video/living-and-non-living-176491) (This activity provides similar experiences for students as the PBS video. The difference is that after each picture and question, the narrator provides the answer with reasoning.)

In this unit’s progression of learning, students first learn that scientists look for patterns and order when making observations about the world and those patterns in the natural world can be observed and used as evidence. Students conduct firsthand and media-based observations of a variety living things and use their observations as evidence to support the concepts* Plants do not need to take in food, but do need water and light to live and grow.
* All animals need food in order to live and grow, that they obtain their food from plants or from other animals, that different kinds of food are needed by different kinds of animals, and that all animals need water.

After determining what plants need to survive, kindergarteners learn that plants are systems, with parts, or structures, that work together, enabling plants to meet their needs in a variety of environments. The vast majority of plants have similar structures, such as roots, stems, and leaves, but the structures may look different depending on the type or variety of plant. Although there are many varieties of plants, their structures function in similar ways, allowing the plants to obtain the water and light they need to survive. In other words, each variety of plant has structures that are well-suited to the environment in which it lives. As students learn about different types of plants and the environments in which they live, they use models, such as diagrams, drawings, physical replicas, or dioramas, to represent the relationships between the needs of plants and the places they live in the natural world. For example, grasses need sunlight, so they often grow in meadows. Cacti, which live in places subject to drought, have thick, wide stems and modified leaves (spines) that keep water within the plant during long periods without rain.After determining what animals need to survive, kindergarteners learn that animals are systems that have parts, or structures, that work together, enabling animals to meet their needs in a variety of environments. Many animals have similar structures, such as mouths or mouthparts, eyes, legs, wings, or fins, but the structures may look different, depending on the type or species of animal. Although there are many types of animals, their structures function in similar ways, allowing them to obtain the water and food they need to survive. In other words, each type of animal has structures that are well-suited to the environment in which they live. As students learn about different types of animals and the environments in which they live, they use models, such as diagrams, drawings, physical replicas, or dioramas, to represent the relationships between the needs of animals and the places they live in the natural world. For example, deer eat buds and leaves; therefore, they usually live in forested areas; pelicans eat fish, therefore they live near the shorelines of oceans or seas.The final portion of the learning progression focuses on the understanding that plants and animals are system with parts, or structures, that work together. Students use what they have learned about plants and animals to make further observations to determine ways in which plants and animals change their environment to meet their needs. For example:* Tree roots can break rocks and concrete in order to continue to grow, plants will expand their root systems in search of water that might be found deeper in the earth, and plants can be found growing around and through man-made structures in search of light.
* A squirrel digs in the ground to hide food, and birds collect small twigs to build nests in trees. Students need opportunities to make observations, and then, with adult guidance, to use their observations as evidence to support a claim for how an animal can change its environment to meet its needs.

Students need opportunities make observations; then, with adult guidance, they can use their observations as evidence to support a claim about how living things can change its environment to meet its needs.Mystery Science Suggested Lessons:[Plant and Animal Secrets: Plant and Animal Needs](https://mysteryscience.com/secrets/animal-needs) Mystery 1: Survival Needs: Food (*Why do Woodpeckers Peck Food?)*Mystery 2: Animal Homes *(Where do animals live?)*Mystery 3: Animal Needs: Safety *(How can you find animals in the woods?)*Mystery 4: Changing the Environment *(How do animals make their homes in the forest?)*Mystery 5: Plant Needs: Sunlight *(How do plants and trees grow?)*Mystery 6: Animal Needs and Changing the Environment: (*Why would you want an old log in your backyard?)***Better Lesson Suggested Unit:****Plant Needs**1. [What Do Plants Need Part 1](https://betterlesson.com/lesson/640647/what-do-plants-need-part-i) *Students will be able to describe what plants need to survive by completing a simple investigation.*
2. [What Do Plants Need Part 2](https://betterlesson.com/lesson/641195/what-do-plants-need-part-ii) *Student will be able to identify some needs of plants by completing an investigation*
3. [Comparing Needs of Plants and Humans](https://betterlesson.com/lesson/641203/comparing-needs-of-plants-and-humans) *Students will be able to compare the needs of plants and humans by completing a Venn diagram.*

**Animal Needs (Awesome Animals)**1. [Survival of the Fittest: Exploring Basic Needs](https://betterlesson.com/lesson/599355/survival-of-the-fittest-exploring-basic-needs?from=breadcrumb_lesson) *Students will identify and match key elements that different living things need to survive.*
2. [Toad’s Abode- Interior Design For Our Toad](https://betterlesson.com/lesson/635015/toad-s-abode-interior-design-for-our-toad?from=breadcrumb_lesson) *Students create a diagram to identify elements of a Fire Bellied Toad habitat.*
3. [Hermie’s Home- Create a Crabitat for Hermie](https://betterlesson.com/lesson/635017/hermie-s-house-create-a-crabitat-for-hermie?from=breadcrumb_lesson) *Students will use a diagram to identify elements of a hermit crab habitat.*
4. [Spider Power! Exploring a Spider’s Web](https://betterlesson.com/lesson/635020/spider-power-exploring-a-spider-s-web?from=breadcrumb_lesson) *Students will use a diagram to identify elements of a spider web.*
5. [Bee Colonies- Exploring Natures First Condo](https://betterlesson.com/lesson/635774/bee-colonies-exploring-nature-s-first-condo?from=breadcrumb_lesson) *Students will create a model to identify elements of a bee colony.*
6. [Awesome Animals](https://betterlesson.com/lesson/635240/awesome-animals-assessment-follow-me-duuude?from=breadcrumb_lesson) (Summative Assessment)
 |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| *Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards*.*Students who understand the concepts are able to:** Observe that systems in the natural and designed world have parts that work together.
* Use a model to represent relationships between the needs of different plants and the places they live in the natural world. (Plants, animals, and their surroundings make up a system.)
* Examples of relationships could include that grasses need sunlight, so they often grow in meadows.
* Examples of models include diagrams, drawings, physical replicas, dioramas, dramatizations, or storyboards.
* Use a model to represent the relationships between the needs of different animals and the places they live in the natural world. (Plants, animals, and their surroundings make up a system.)
* Examples of relationships could include that deer eat buds and leaves and therefore usually live in forested areas.
* Examples of models include diagrams, drawings, physical replica, dioramas, dramatizations, and storyboards.
 | *Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*[Awesome Animals](https://betterlesson.com/lesson/635240/awesome-animals-assessment-follow-me-duuude?from=breadcrumb_lesson) (Summative Assessment)**Mystery Science Assessments *(all resources are accessible on google drive)***[Mystery 1: Animal Needs: Food](https://docs.google.com/presentation/d/1JEVu0MgJIdtr2GydZ4UB_oECWQfdEz1y-2BeaU7K2Fk/edit?usp=sharing)[Read-Along Mystery 2: Animal Homes](https://docs.google.com/presentation/d/1-IlrWKAssav1zqdy3B1lFzcG6nZYR8UVhFUoE3VqKV8/edit?usp=sharing)[Mystery 3: Animal Needs: Safety](https://docs.google.com/presentation/d/1r2iP3n3DgJjimxeVoE0kkpdxicYK30VgYvYT5N3U308/edit?usp=sharing)[Read-Along Mystery 4: Changing the Environment](https://docs.google.com/presentation/d/1yLIPLtQIyuxvzTCQCt4J1-aMBh3HBian-MRgqT-KmVU/edit?usp=sharing) [Mystery 5: Plant Needs: Sunlight](https://docs.google.com/presentation/d/1XYYORwqErv4wv77yeZgvSZjF-BrotkNk_FJPw0IyGLc/edit?usp=sharing) [Read-Along Mystery 6: Animal Needs and Changing the Environment](https://docs.google.com/presentation/d/1-S9gGDMz0a31xTPhNqbV1-vEgDQHOu3xB3BcHqcnFZA/edit?usp=sharing) |
| **Alternative Assessments** |
| **Evaluative Criteria** | **Assessment Evidence** |
| **Suggested Performance Rubric:** Use the following or similar rubric to evaluate students’ performance on lesson assessments:

|  |  |
| --- | --- |
| **4 - Innovating:** | Advanced understanding and application of the standard |
| **3 - Applying:** | Consistently applies skills independently |
| **2 - Developing:** | Progressing towards independent application of skills |
| **1 - Beginning:** | Early stages of development, need assistance |

 | Suggested Performance Tasks include but are not limited to:**Performance Task: STEAM:** [Basic Needs of Living Things](http://betterlesson.com/lesson/640647/what-do-plants-need-part-i)What Do Plants Need?**Essential Question-**What do plants need to survive? **Description of Task-**Students will be able to describe and draw conclusions about plant needs to survive and begin to compare them to human needs after completing a simple investigation of the planting process.**Materials/Resources-***Suggested* materials:* What Do Plants Need record sheet
* 12 cups for planting
* Potting soil
* Bean seeds
* 2 brown paper bags
* Water
* Student chosen materials
* Science journals
* Recording sheet

[www.Learn360.com](http://www.learn360.com)(Plants are Living Things)Related texts**Assessment-**Students who understand the concepts are able to:* Observe and use patterns in the natural world as evidence
* Use observations to describe patterns in what plants need to survive

RubricObservationsScience JournalsEnd Product |
| **District/School Texts** | **District/School Supplementary Resources** |
| Haddon Heights - Unit Kits for Science Labs and ReferencesLawnside - Houghton Mifflin Harcourt : Science FusionMerchantville- Exploring Science (National Geographic Learning)Barrington- Journeys (ELA Connection Resources)  | [Read-Aloud Lesson: Where Do Polar Bears Live?](http://www.readworks.org/lessons/gradek/where-do-polar-bears-live/read-aloud-lesson) Students identify and recall characteristics that allow polar bears to survive in the extremely cold Arctic environment. ["Good Night" & Where Do Polar Bears Live?](http://www.readworks.org/lessons/gradek/where-do-polar-bears-live/paired-text-questions) This is a Paired Text activity that uses the “Where Do Polar Bears Live” read aloud and the non-fiction text “Good Night” which addresses hibernation. [The Needs of Living Things](http://www.pbslearningmedia.org/resource/tdc02.sci.life.colt.lp_stayalive/the-needs-of-living-things/) This lesson plan has one level for Grades K-2 and another level for Grades 3-5. Students will learn about what plants and animals need to survive and how habitats support those needs. They will also learn about how organisms can change their environment. [Living Things and Their Needs:](http://www.bioedonline.org/lessons-and-more/teacher-guides/living-things-and-their-needs/)  This is an excellent resource that provides a Teacher Guide, videos, reading resources, and student activity sheets. The objective of the lessons is for students to learn about living organisms and what they need to survive. These lessons can easily be taught as an interdisciplinary set of learning experiences.[Curious George:](http://www.pbslearningmedia.org/resource/lsps07.sci.life.gen.cgtowelplant/paper-towel-plants/) Paper Towel Plans: This video from Curious George shows students helping bean seeds sprout outside of soil by meeting their essential needs for moisture, temperature, air, and light. The children place the beans and a wet paper towel inside a zippered plastic bag and leave them undisturbed in a warm, well-lighted place. After two weeks, the students return and observe that the beans have sprouted and, like apple seeds, will one day grow to be fully developed plants.[From Seed to Fruit | Everyday Learning:](http://www.pbslearningmedia.org/resource/evscps.sci.life.seed/from-seed-to-fruit/) Seed to Fruit takes children through the different stages of growth in the life of a cherry tomato plant. Planting a seed in a cup and watching it grow over time is a wonderful way to introduce the life cycle to young children. This resource is part of the KET Everyday Science for Preschoolers collection. This video is available in both English and Spanish audio, along with corresponding closed captions.[Think Garden: The Importance of Water:](http://www.pbslearningmedia.org/resource/thnkgard.sci.ess.water/think-garden-the-importance-of-water/) This video from KET's Think Garden collection explores why plants need water to survive, and how they tell us they're thirsty. Learn about the signs plants give when they've had too much or too little water and the part water plays in the process of photosynthesis. See a quick, easy-to-understand animation explaining the water cycle and transpiration process. Also find out how to improve water quality with rain gardens and how to conserve water with rain barrels. This video is available in both English and Spanish audio, along with corresponding closed captions.[Think Garden: Plant Structure:](http://www.pbslearningmedia.org/resource/5dea21b4-6c92-46ff-982c-8650f9429c01/think-garden-plant-structure/) This video from KET’s Think Garden collection examines plant structure by taking a closer look at the root and shoots systems. Learn about roots, stems, leaves, flowers, seeds, and fruit through engaging illustrations and animations.**Read Aloud Books:****Fish-***Swimmy* by Leo Lionni*Fish is Fish* by Leo Lionni*Fish Faces* by Norbert Wu*What is a Fish?* by Lola Schaefer*What’s it Like to be a Fish?* by Wendy Pfeffer and Holly Keller*My Goldfish* by Miss Frances*Fish Out Of Water* by Helen Palmer*All Kinds of Fish* by Anne W. Phillips**Worms-***Wonderful Worms* by Linda Glasen*It Could Still Be A Worm* by Allan Fowler**Snails-***The Snail’s Spell* by Joanne Ryder*Are You a Snail?* by Judy Allen and Tudor Humphries*Slugs and Snails* by Theresa Greenway*Snails in School!* by Christine Economos*What Lives in a Shell?* by Kathleen Weidner Zoehfeld**Pill/Sow Bugs-***A Pill Bug’s Life* by John Himmelman**Caterpillars/Butterflies-***The Very Hungry Caterpillar* by Eric Carle*Butterflies and Moths* by Kris Hirschmann*Butterflies & Caterpillars* bt Melvin and Gilda Berger*Butterfly Garden* by Margaret McNamara**General Books On Animals:***Animal Dads* By Sneed Collard and Steve Jenkins*Biggest, Strongest, Fastest* by Steve Jenkins*Elephants Swim* by Linda Riley*Look Once, Look Again: Animal Tails* by David Schwartz and Dwight Kohn*“Our Big Home” An Earth Poem* by Linda Glaser and ELisa Kleven*What Animal Lives Here?* by Marilyn Wooley and Keith Pigdon*What Do You Do When Something Wants to Eat You?* by Steve Jenkins*What’s Alive?* by Kathleen Weidner Zoehfeld*Whose Feet Are These?* byWayne Lynch**ELA Connections (Journeys):****Animals-**Unit 2 Lesson 7 Mice Squeak, We SpeakUnit 2 Lesson 8 Move!Unit 3 Lesson 13 What Do You Do with a Tail Like This? (animal bodies)Unit 3 Lesson 14 Turtle Splash! (habitat)Unit 4 Lesson 17 Caterpillar to Butterfly (life cycle)Unit 5 Lesson 24 Chameleon, Chameleon (colors)**Plants-**Unit 5 Lesson 23 Zinnia’s Flower Garden (how things grow)Unit 5 Lesson 25 Pie in the Sky (growing plants/food)**FOSS (Animals Two by Two):**Investigation 1-Guppies and GoldfishInvestigation 2-Land and Water Snails Investigation 3-Big and Little WormsInvestigation 4-Pill Bugs and Sow Bugs**Youtube:**Amazing Facts about Snails <https://www.youtube.com/watch?v=ZwzPaKe71Ns>11 Cool Facts about Land Snails <https://www.youtube.com/watch?v=Eq9xo8FMybs> Worms are Wonderful <https://www.youtube.com/watch?v=l-zc_1vjLnI> How a Caterpillar Becomes a Butterfly <https://www.youtube.com/watch?v=V5RSpMQQOpw> Monarch Butterfly Life Cycle <https://www.youtube.com/watch?v=ocWgSgMGxOc> **-Scholastic News****-Brain POP** **-Read Works** |
| [**Interdisciplinary Connections**](http://www.state.nj.us/education/cccs/)  |
| **ELA**Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2) **W.K.1** Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS2-2) **W.K.2**Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1) **W.K.7** Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1) **SL.K.5**With prompting and support, ask and answer questions about key details in a text. (K-ESS2-2) **R.K.1** | **Math**Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K-LS1-1) **K.MD.A.2**Reason abstractly and quantitatively. (K-ESS3-1) **MP.2** Model with mathematics. (K-ESS3-1) **MP.4** Counting and Cardinality (K-ESS3-1) **K.CC** | Technology8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss |
| **21st Century Skills/Career Education**CRP2. Apply appropriate academic and technical skills. |  |  |
| **Modifications and Accommodations** |
| **Special Education Students**Small groupDirect instructionrestate/rephrasegraphic organizersmodified assignmentschunkingleveled textintentional groupingread textextended timebreaksTeacher records/ student dictates | **English Language Learners**Labelsword banksvisualsstudent friendly definitionsextended timechunkingintentional grouping | **Students at Risk of School Failure**leveled text graphic organizersmodified assignmentskinesthetic activitiesrestate/rephrasechunkingintentional grouping |
| **Gifted and Talented**extension projectleveled textleadership rolesintentional groupingTargeted learning from assessment | **Students with 504 Plans**breakschunkingpreferential seatingvisual remindersrestate/rephrasecheck-in/check-out systemvisual timeTeacher records/ student dictates |  |
| **Unit Duration: Instructional Days** |
| 20 Instructional Days |

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| **STANDARD:** **K-2-ETS1 - Engineering Design****K-ESS3 - Earth and Human Activity** |
| **Unit 5: Basics Needs of Human** |
| **ESTABLISHED GOALS (INDICATOR #)** | **TRANSFER (How will this apply to their lives?)** |
| **K-ESS3-3 - Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.** **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.** | *Students will be able to independently use their knowledge to…** *Communicate solutions that will reduce the impact of humans on the land, water, air, and /or other living things in the local environment*
* *Decide whether people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.*
 |
| **MEANING** |
| UNDERSTANDINGS:* Events have causes that generate observable patterns.
* Things that people do to live comfortably can affect the world around them.
* People can make choices that reduce their impacts on the land, water, air, and other living things.
* Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people.
* A situation that people want to change or create can be approached as a problem to be solved through engineering.
* Asking questions, making observations, and gathering information are helpful in thinking about problems.
* Before beginning to design a solution, it is important to clearly understand the problem.
 | ESSENTIAL QUESTIONS:* *How can humans reduce their impact on the land, water, air, and other living things in the local environment?*
 |
| **Unit 5: Grade K -Suggested Lessons** |
| In this unit of study, students will develop an understanding of the impact that humans have on the land, water, air, and other living things in the local environment and engage in a portion of the engineering design process in order to communicate solutions that can reduce these impacts.To help students recognize the impact that humans have on the living and nonliving components of the local environment, they need opportunities to observe and think about the things that people do to live comfortably. Over a period of a few days, students can observe their families in their day-to-day lives, paying attention to what they eat, what they throw away, when and how they use water, how they warm or cool their home, what types of appliances and gadgets they use, how they maintain their home and yard, what resources are used to make the clothes they wear, how they travel from place to place, and how they communicate with others. During whole-group discussions, students can share their observations and then discuss the concept of comfortable lifestyle. This list could include:* Plants and animals for food
* Trees, rocks, sand, and other materials for building homes and schools
* Local reserves of water for drinking, washing clothes, showering, washing dishes, watering lawns, and cooking
* Gas and oil for cars and buses
* Electricity to power the appliances in their homes
* Land for homes, schools, parks, parking lots, and landfills

Then the class can discuss how obtaining and using these types of resources affects the local environment. To help with these discussions, teachers can use books, multimedia resources, field trips, or even invite guest speakers to the classroom. As students participate in discussions, they should be encouraged to ask questions, share observations, and describe cause-and-effect relationships between human use of resources and human impact on the environment.As students come to understand that things people do to live comfortably can affect the world around them, they are ready to engage in the engineering design process. The process should include the following steps:* As a class or in groups, students participate in shared research to find examples of ways that people solve some of the problems created by humans’ use of resources from the environment. For example, people in the community might choose to:
* Recycle plastic, glass, paper, and other materials in order to reduce the amount of trash in landfills;
* Plant trees in areas where trees have been cut down for lumber to renew regional habitats for local wildlife; or
* Set up rainwater collection systems so that rainwater can be used to maintain landscaping instead of using water from local reserves.
* Groups of students then develop a simple sketch, drawing, diagram, or physical model to illustrate how the solution reduces the impact of humans on land, water, air and/or other living things in the local environment.
* Groups need the opportunity to communicate their solutions with the class in oral and/or written form, using their sketches, drawings, diagrams, or models to help explain how the solution reduces the human impact on the environment.

While engaging in this process, students should learn that even though humans affect the environment in many ways, people can make choices that reduce their impacts on the land, water, air, and other living things in the environment.**BetterLessons Suggested Lessons***\*These lessons can be incorporated throughout the school year as appropriate with content they do not need to be taught in order as a unit\**1. [*Yuck!*](https://betterlesson.com/lesson/629013/yuck?from=search) *Students will be able to define a problem and come up with a possible solution.*

**Big Idea:** Placing an apple in various compost locations helps students decide the most efficient way to dispose of food waste.1. [Where Has All The Wood Gone?](https://betterlesson.com/lesson/635907/where-has-all-the-wood-gone?from=search) *SWBAT identify objects made out of wood by going on a hunt around the room.*

**Big Idea:** Young children often confuse what objects are made of and this lesson helps them zone in on objects made of wood.1. [Give and Get- Reduce, Reuse, Recycle & Remind!](https://betterlesson.com/lesson/637871/give-and-get-reduce-reuse-recycle-remind?from=search)  *Students will collect materials and find alternatives to trash to practice recycling.*

**Big Idea:** Why is it important to keep things out of the landfill?1. [Make it Monumental!](https://betterlesson.com/lesson/631028/make-it-monumental?from=search) *SWBAT use the engineering design process by designing and building a monument to something special to them.*

**Big Idea:** Kids meld science and social studies into a lesson that recycles, reduces and reuses.1. [Natural vs. Man Made- Introduction](https://betterlesson.com/lesson/637596/natural-vs-man-made-an-introduction?from=search) *Students will distinguish between things that are natural vs. man made by completing a sort.*

**Big Idea:** Students are surrounded by "stuff"! Can they figure out if it came from nature or whether it was made by man?1. [Natural vs. Man Made- Further Exploration](https://betterlesson.com/lesson/637951/natural-vs-man-made-further-exploration?from=breadcrumb_lesson) *Students will be able to determine if an item is from nature or man-made by completing a sort.*

**Big Idea:** Discerning whether an item is from nature or man-made can be a challenging task for kindergartners. This lesson gives them extra practice.1. [Exploring Natural Resources and Products](https://betterlesson.com/lesson/637952/exploring-natural-resources-and-products?from=breadcrumb_lesson)  *Students will be able to identify natural resources and products by completing a sort.*

**Big Idea:** Natural resources and products are important concepts in both science and social studies. Students will have the opportunity to better understand these concepts in this interactive lesson.1. [Natural Resources- More Practice](https://betterlesson.com/lesson/637953/natural-resources-and-products-more-practice?from=breadcrumb_lesson) *Students will be able to identify natural resources and corresponding products by creating a book.*

**Big Idea:** This lesson brings together science, social studies and language arts as students explore more about natural resources and products.1. [Stewardship- Our Responsibility](https://betterlesson.com/lesson/633252/stewardship-our-responsibility?from=breadcrumb_lesson) *SWBAT give examples of stewardship including recycling and reducing what we throw away.*

**Big Idea:** Who would throw away a plastic bottle?!? Not us! We recycle!1. [Where Does Our Garbage Go?](https://betterlesson.com/lesson/633889/where-does-our-garbage-go?from=breadcrumb_lesson) *SWBAT explain what happens to garbage and give examples of ways we can reduce the waste.*

**Big Idea:** Students learn what happens when we throw things away!1. [Recycling In Our Classroom](https://betterlesson.com/lesson/634730/recycling-in-our-classroom?from=breadcrumb_lesson) *SWBAT generate ideas for reducing, reusing, and recycling in our classroom.*

**Big Idea:** Students design a system for reducing waste in our classroom.1. [Composting](https://betterlesson.com/lesson/634731/composting?from=breadcrumb_lesson) *SWBAT summarize how composting makes good soil for plants to grow in.*

**Big Idea:** Egg shells! Worms! What else do we need?!1. [STEM LAB: Design a Feeder](https://betterlesson.com/lesson/633884/stem-lab-designing-a-feeder?from=breadcrumb_lesson) SWBAT use the engineering design cycle to plan how to create a bird feeder.

**Big Idea:** It's getting cold! Birds need to eat, too!1. [STEM LAB: Building and Evaluating a Feeder](https://betterlesson.com/lesson/633887/stem-lab-building-and-evaluating-a-feeder?from=breadcrumb_lesson) *SWBAT build and evaluate their own bird feeder.*

**Big Idea:** With their own designs, students build and test a bird feeder!1. [Environmental Engineers](https://betterlesson.com/lesson/631770/environmental-engineers?from=search) *Students will learn about recycling and share with their families how to recycle.*

**Big Idea:** Environmental engineers address issues that help improve the quality of life for humans and the earth. |
| **District/School Formative Assessment Plan** | **District/School Summative Assessment Plan** |
| *Students who understand the concepts are able to:** Observe patterns in events generated due to cause-and-effect relationships.
* Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.
* Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
* Ask questions based on observations to find more information about the natural and/or designed world.
* Define a simple problem that can be solved through the development of a new or improved object or tool.
* Ask questions, make observations, and gather information about a situation that people want to change in order to define a simple problem that can be solved through the development of a new or improved object or tool.
 | *Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.****\*See assessment component of each lesson above \****  |
| **Alternative Assessments** |
| **Evaluative Criteria** | **Assessment Evidence** |
| **Suggested Performance Rubric:** Use the following or similar rubric to evaluate students’ performance on lesson assessments:

|  |  |
| --- | --- |
| **4 - Innovating:** | Advanced understanding and application of the standard |
| **3 - Applying:** | Consistently applies skills independently |
| **2 - Developing:** | Progressing towards independent application of skills |
| **1 - Beginning:** | Early stages of development, need assistance |

 | Suggested Performance Tasks:**Performance Task: STEAM-** [Paper to Paper](http://betterlesson.com/lesson/638906/paper-to-paper)**Essential Question-**How can used paper still be useful instead of being thrown away by making paper from used paper?**Description of Task-**Students will change paper to make paper by recycling paper materials.**Materials/Resources-**

|  |  |
| --- | --- |
| -One clear bottle-1 self-stick note-2 screens-2 sheets of newspaper-1 sponge-8 squares of one-ply toilet paper | -1 clean basin-1 quart pitcher-Waxed paper-Student chosen materials-Water-Science journals |
|
|

[www.Learn360.com](http://www.learn360.com)(Recycle: Newspaper)Related texts**Assessment-**Students who understand the concepts are able to:* Analyze data from tests of an object or tool to determine if it works as intended
* Develop a simple model based on evidence to represent a proposed object or tool

RubricObservationsScience JournalsEnd Product |
| **District/School Texts** | **District/School Supplementary Resources** |
| Haddon Heights - Unit Kits for Science Labs and ReferencesLawnside - Houghton Mifflin Harcourt : Science FusionMerchantville- Exploring Science (National Geographic Learning)Barrington- Journeys (ELA Connection Resources)  | **Read Aloud Books:***Why Should I Recycle?* by Jen Green*Our Class Is Going Green!* by Mrs. Nickel’s Kindergarten Class at Oak Park Elementary in Bartlesville, Oklahoma*Be a Friend to Trees* by Patricia Lauber**-Scholastic News****-Brain POP** **-Read Works** |
| [**Interdisciplinary Connections**](http://www.state.nj.us/education/cccs/)  |
| **ELA**Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS3-3) **W.K.2**Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1) **RI.2.1** With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1) **W.2.6** Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1) **W.2.8** | **Math**Reason abstractly and quantitatively. (K-2-ETS1-1) **MP.2** Model with mathematics. (K-2-ETS1-1) **MP.4** Use appropriate tools strategically. (K-2-ETS1-1) **MP.5** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1) **2.MD.D.10** | **Technology**8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss |
| **21st Century Skills/Career Education**CRP2. Apply appropriate academic and technical skills. |  |  |
| **Modifications and Accommodations** |
| **Special Education Students**Small groupDirect instructionrestate/rephrasegraphic organizersmodified assignmentschunkingleveled textintentional groupingread textextended timebreaksTeacher records/ student dictates | **English Language Learners**Labelsword banksvisualsstudent friendly definitionsextended timechunkingintentional grouping | **Students at Risk of School Failure**leveled text graphic organizersmodified assignmentskinesthetic activitiesrestate/rephrasechunkingintentional grouping |
| **Gifted and Talented**extension projectleveled textleadership rolesintentional groupingTargeted learning from assessment | **Students with 504 Plans**breakschunkingpreferential seatingvisual remindersrestate/rephrasecheck-in/check-out systemvisual timeTeacher records/ student dictates |  |
| **Unit Duration: Instructional Days** |
| 15 Instructional Days |