Englewood Public School District
Science
Grade 3
First Marking Period

Unit 1: Weather and Climate

Overview: In this unit of study, students organize and use data to describe typical weather conditions expected during a particular season. By applying their understanding of weather-related hazards, students are able to make a claim about the merit of a design solution that reduces the impacts of such hazards. The crosscutting concepts of *patterns, cause and effect*, and the *influence of engineering, technology, and science on society and the natural world* are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in a*sking questions and defining problems, analyzing and interpreting data, engaging in argument from evidence*, and *obtaining, evaluating, and communicating information*. Students are also expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 3-ESS2-1, 3-ESS2-2, 3-ESS3-1, and 3-5-ETS1-1.

Time Frame: 15 to 20 days

Enduring Understandings:
Patterns can be used to make predictions.
Climate describes the range of an area's typical weather conditions and the extent to which those conditions vary over years.

Essential Questions:
Can we predict the kind of weather that we will see in the spring, summer, autumn, or winter?
How can climates in different regions of the world be described?

Standards	Topics and Objectives	Activities	Resources	Assessments
3.ESS3-1 **Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** **3-ESS3-1** **Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.**	**Topics** Weather and Climate Twenty-First Century Themes and Skills include: Environmental Literacy • The Four C's • Environmental Literacy • Global Awareness **Objectives**	Collecting and Analyzing Weather Data: **Day 1:** Students will use prior knowledge to determine what tools people use to predict weather. Students will analyze monthly weather averages for their area and make a list of reasons why this information is important. (3-ESS3-1) **Day 2:** Students will explore	**Lesson Plan Links:** Links to anemometer designs: https://www.education.com/science-fair/article/make-anemometer/ Links to wind vane designs: https://hubpages.com/education/How-to-Make-a-Wind-Vane-for-Kids Links to barometer designs:	**Formative Assessments:** **Weather and Climate:** Climatogram Report or Brochure **Weather Related Hazard** Foldable **Benchmark Assessment**: Exact Path **Summative Assessment:** **Collecting and Analyzing**

3-ESS3-1 **Science affects everyday life.**	Students will be able to evaluate ways meteorologists measure weather elements by designing and using their own weather instrument. They will collect data to see changes and patterns in weather. **Forecast the Weather:** Weather Forecasting and Map Reading • Draw conclusions about the effects of weather. • Compare and contrast different weather forecasts. • Use maps to analyze different weather conditions. • Complete and record an online weather script. • Write a first-person report from the center of a storm. What's the Difference Between Weather and Climate: Students will be able to demonstrate the difference between weather and climate. **Twenty First Century:** Students will describe the difference between weather and climate. Then they will identify and describe the climate region for their region in order to graph and interpret a comparison chart. **Weather Related Hazard:** Students will research an assigned weather hazard and	different weather tools and after viewing a short video will begin designing their own tool in small STEM groups. **Day3**: Students will present their weather projects to other groups, reflect on their presentations and revise tool prior to whole class data collection. (MP.4, CRP6) **Day 4 and Onward:** Students will set up their weather tool and collect data for an extended period of two weeks or more. (3-ESS3-1, 8.2.5.A.2) **Forecast the Weather:** **Day 1:** Students will watch a variety of live weather forecasts and list what types of information is presented in them. (8.2.5.A.1, 9.2.4.A.1) **Day 2-3:** Students will choose one type of weather to research further and complete the *Analyze Forecast Activity*. Students will write their own script and practice having in videoed. They may bring in props to help them. (W.3.9, MP.2, CRP4, W.3.7, RI.3.1) **Day 4**: Students will compare and contrast reporting from a studio versus live weather reporting. Students will work in small groups to create a live	https://easyscienceforkids.com/make-your-own-barometer/ Links to rain gauge designs: https://theimaginationtree.com/homemade-rain-gauge/ Links to thermometer designs: https://www.education.com/activity/article/make_a_homemade_thermometer_middle/ Elementary Engineering Design Process: http://www.eie.org/content/engineering-design-process Climate Kids: http://climatekids.nasa.gov/climate-tales/ Weather and Climate: Weather Learning Log or Student Worksheet. Weather data from Activity 3: Track Weather like a Meteorologist. Climate world map: climate map How to Create a Climatogram step-by-step instructions Computer with Internet access. Li Bing and the Flooding Reading **Additional Texts:** **Man Who Named the Clouds**	**Data:** Final Power Point presentation **Forecast the Weather:** Final Weather Forecast Video and Script **Alternative Assessments:** Students will use books and other reliable media resources to collect weather and climate information for a given region. Charts and graphs Students will compare information found in two different texts and use information to answer questions about weather and climate. Venn Diagram to make comparisons Students will take brief notes as they conduct research and sort evidence into provided categories. Students will use appropriate tools and units of measure when collecting and recording weather and climate data. Students will model with mathematics when organizing data into scaled bar graphs, pictographs, and tables.

	develop a solution based on their research**.**	weather report on a major weather occurrence. Students can visit the *Extreme Weather Site* to help them to understand the weather conditions they may experience. (RI.3.9, MP.5, 3.MD.B.3, 6.1.4.B.4) **Day 5:** Students will practice and revise their presentations in their small groups in preparation for their videotaped program. (W.3.1) **Day 6:** All presentations are videoed and then shared with the class. Students will discuss which presentations provided them with the most important information to understand the severe weather even. **What's the Difference Between Weather and Climate:** Students separate M&M's into different color groups and make predictions based on the data they collected. They will understand that they can't predict exactly what is in a fresh bag but can make predictions based on trends in the data they collected. **Weather and Climate:** **Part 1**: Students review climate data for their assigned global city and assign it a climate region based on the climate map.	**Twister on Tuesday** **Oh Say Can You Say What's The Weather Today** **Kid's Book of Weather Forecasting** **On the Same Day in March** **Clouds** **Inside a Hurricane** **Flash, Crash, Rumble, and Roll** https://www.weather.gov/safety/	Students will reason abstractly and quantitatively as they analyze and compare weather data. Students will use information to answer questions and solve multistep problems.

Part 2: Students will draw a comparison chart that displays both the average monthly temperature over one year in the form of a Line graph and average monthly precipitation over one year in the form of a Bar graph.

Part 3 (Extension): Students will choose either a brief written report or create a tourism brochure, pamphlet, etc. describing the climate for their region. (W.3.7, 6.1.4.B.4)

Weather Related Hazard:
(PDF pages 28-44)
(6.1.4.B.4)

Activity 1:
Complete the engaging student activity and have the groups select their weather hazard. (3-ESS3-1)

Activity 2:
Have students complete research using the internet, encyclopedia, and other non-fiction books. (8.2.5.A.2)

Activity 3:
Students create a solution to their weather hazard based on their research. Students will then compile research and their solution into a foldable.

Activity 4: Students present their findings to the class or

	other classes.

Accommodations and Modifications:

Students with special needs: Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered.

ELL/ESL students: Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://www.wida.us/standards/CAN_DOs/ . This particular unit has limited language barriers due to the physical nature of the curriculum.

Students at risk of school failure: Formative and summative data will be used to monitor student success at first signs of failure student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations. More time and will be made available with a certified instructor to aid students in reaching the standards.

Gifted and Talented Students: Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.

English Language Learners	**Special Education**	**At-Risk**	**Gifted and Talented**
• Speak and display terminology • Teacher modeling • Peer modeling • Provide ELL students with multiple literacy strategies. • Word walls • Use peer readers • Give page numbers to help the students find answers • Provide a computer for written work • Provide two sets of textbooks, one for home and one for school	• Increase one on one and small group time • Utilize modifications & accommodations delineated in the student's IEP • Work with paraprofessional • Use multi-sensory teaching approaches. • Work with a partner • Provide concrete examples • Restructure lesson using UDL principals (http://www.cast.org/our-work/about-	• Increase one on one and small group time • Using visual demonstrations, illustrations, and models Give directions/instructions verbally and in simple written format. Oral prompts can be given. • Peer Support • Teachers may modify instructions by modeling what the student is expected to do • Instructions may be printed out in large print and hung up for the student to see during the time of the	• Structure the learning around explaining or solving a social or community-based issue. • Curriculum compacting • Inquiry-based instruction • Independent study • Higher order thinking skills • Adjusting the pace of lessons • Interest based content • Real world scenarios • Student Driven Instruction • Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understand-ings.

• Provide visual aides • Provide additional time to complete a task • Use graphic organizers	udl.html#.VXmoXcfD_UA). • Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).	lesson. • Review behavior expectations and make adjustments for personal space or other behaviors as needed. • Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. • Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).	• Use project-based science learning to connect science with observable phenomena. • Collaborate with after-school programs or clubs to extend learning opportunities.

Interdisciplinary Connections:

ELA-NJSLS/ELA:
W.3.1: Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-ESS3-1)
W.3.7: Conduct short research projects that build knowledge about a topic. (3-ESS3-1)
RI.3.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-ESS2-2)
RI.3.9: Compare and contrast the most important points and key details presented in two texts on the same topic. (3-ESS2-2)
W.3.9: Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-ESS2-2)

Social Studies:
6.1.4.B.4: Describe how landforms, climate and weather, and availability of resources have impacted where and how people live and work in different regions of New Jersey and the United States.

Mathematics:
MP.2: Reason abstractly and quantitatively. (3-ESS2-1), (3-ESS2-2),(3-ESS3-1)
MP.4: Model with mathematics. (3-ESS2-1),(3-ESS2-2), (3-ESS3-1)
3.MD.B.3: Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in bar graphs. (3-ESS2-1)

Career Ready Practices:
CRP6: Demonstrate creativity and innovation**.**
CRP4: Communicate clearly and effectively and with reason.
CRP8: Utilize critical thinking to make sense of problems and persevere in solving them.

Integration of Technology Standards NJSLS 8:
8.2.5.A.2: Investigate and present factors that influence the development and function of a product and a system**.**
8.2.5.A.1: Compare and contrast how products made in nature differ from products that are human made in how they are produced and used.

Integration of 21st Century Standards NJSLS 9:
9.2.4.A.1: Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

Key Vocabulary:
Weather: the temperature and other outside conditions (such as rain, cloudiness, etc.) at a particular time and place
Climate: the usual weather conditions in a particular place or region
Precipitation: water that falls to the ground as rain, snow, etc.
Wind: natural movement of air outside
Temperature: a measurement that indicates how hot or cold something is
Hazard: a source of danger

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations	**ESS2.D: Weather and Climate**	**Patterns**

• Plan and conduct investigations collaboratively to produce evidence to answer a question. (1-PS4-1),(2-LS2-1) **Analyzing and Interpreting Data** • Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) **Engaging in Argument from Evidence** • Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1) **Obtaining, Evaluating, and Communicating Information** • Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2)	• Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) • Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2) **ESS3.B: Natural Hazards** • A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) *(Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)*	• Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2) **Cause and Effect** • Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1) --- ***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** • Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones). (3-ESS3-1) --- ***Connections to Nature of Science*** **Science is a Human Endeavor** • Science affects everyday life. (3-ESS3-1)