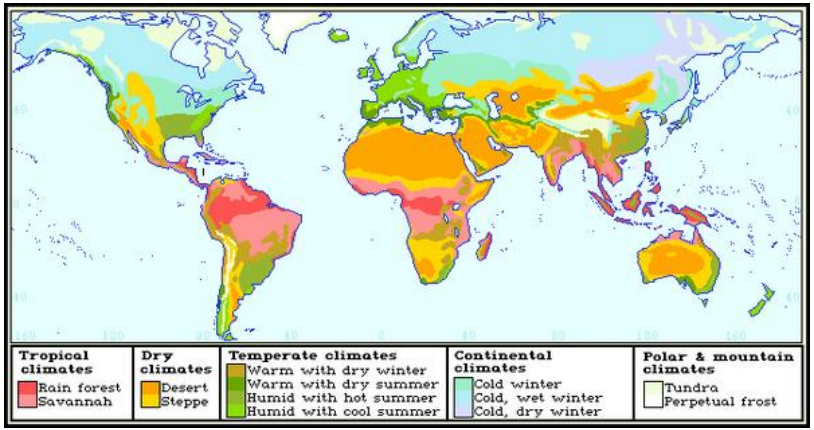
3rd Grade Unit 2
6 weeks

Weather and Climate



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Essential Questions

What is the typical weather in different parts of the world? How does this change throughout the year?

How can the impact of weather-related hazards be reduced?

Weather and Climate

Students who demonstrate understanding can:

3-ESS2-1 **Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.]

3-ESS2-2 **Obtain and combine information to describe climates in different regions of the world.**

3-ESS3-1 **Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.*** [Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices

Analyzing and Interpreting Data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- 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

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- 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

Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

- Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2)

Disciplinary Core Ideas

ESS2.D: Weather and Climate

- 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)

Crosscutting Concepts

Patterns

- 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)

Weather and Climate

Background knowledge videos:

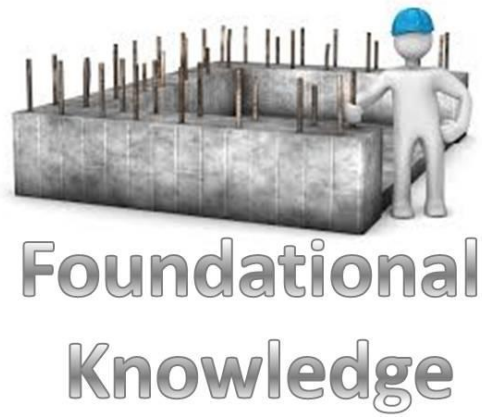
ESS2D - Weather & Climate

ESS3B - Natural Hazards

These videos are designed to assist in providing background knowledge with the associated DCI. The information in the videos follows the progression through high school.

Prior to 3rd grade, students should have knowledge, understanding of, and experiences with the following ideas:

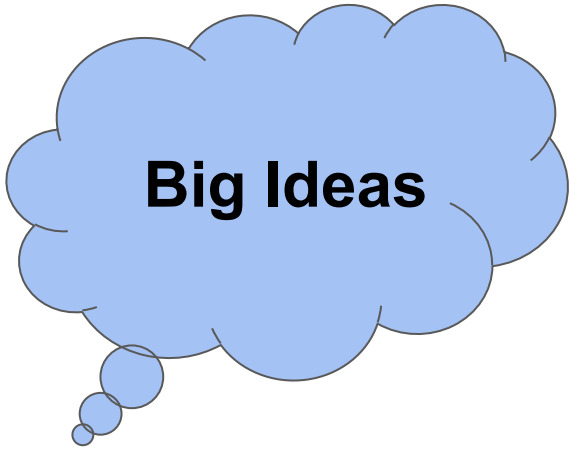
- ★ Sunlight warms Earth's surface.
- ★ Weather is the combination of sunlight, wind, snow, or rain, and temperature in a particular region at a particular time.
- ★ People measure these conditions to describe and record the weather and to notice patterns over time.
- ★ Some kinds of severe weather are 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.



With the implementation of new standards, students may not have had opportunities to engage in these foundational understandings and ideas before 3rd grade. You may need to provide opportunities for students to experience these ideas as you move forward.

What is the typical weather in different parts of the world?
How does this change throughout the year?

How can the impact of weather-related hazards be reduced?



- ★ Scientists record patterns of the weather across different times and areas so they can make predictions about what kind of weather might happen next.
- ★ Climate describes a range of an area's typical weather conditions and the extent to which these conditions vary over years.
- ★ A variety of natural hazards result from natural processes.
- ★ Humans cannot eliminate natural hazards but can take steps to reduce their impacts.
- ★ Claims can be made about the merit of a solution to a problem, citing relevant evidence from a variety of sources.

Weather and Climate

Students who demonstrate understanding can:

3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction. Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.

3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.

Disciplinary Core Ideas

ESS2.D: Weather and Climate

- 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)

Clarifications:

- This provides a great opportunity to build connections with data tables and displays that students might encounter in ACT Aspire.

Identify and CLARIFY the STANDARDS

Weather and Climate

Students who demonstrate understanding can:

3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.*

Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.

Disciplinary Core Ideas

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)

Clarifications:

- Students will need prior experiences with natural hazards before making claims about the merit of a design solution

Identify and CLARIFY the STANDARDS

EARTH AND SPACE SCIENCE

UNIT:
Weather

View Unit

CONCEPT:

About Weather

Weather Data

Protection from Severe Weather

UNIT:
Climate

View Unit

CONCEPT:

About Climate

Types of Climates

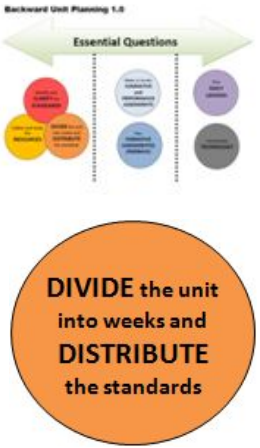
Gather and study the RESOURCES

Discovery Education Science Techbook Units

Week	Performance Expectation/DCI	Resource
1 Building Background Knowledge **Day 1**	**Foundational Knowledge prior to 3rd grade** (this is covered in kindergarten with the NGSS. In order to build missing background knowledge you may need to review these concepts): • Sunlight warms Earth's surface. • 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. • 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.	Pass out KLEWS chart and ask students the guiding questions in order to determine misconceptions. KLEWS Chart Using a KLEWS Chart Example KLEWS Chart • What is weather? • What are the types of precipitation? • What causes weather to change? • What is the difference between the types of precipitation? Make a large KLEWS chart for the whole class to record on. Watch Weather from Discovery Education and discuss with class. What is weather? What are the types of precipitation? What causes weather to change? What is the difference between the types of precipitation? ***Continued on next slide...***

Week	Performance Expectation/ DCI	Resource
1 **Days 2-5** About the Weather	**3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction. Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.	**About Weather: DE Model Lessons** **Engage:** Video: Today's Weather **Exploration 1:** About Weather Interactive Lab: Students explore conditions of the atmosphere (temperature, pressure, humidity, and wind) *Note: read Teacher's Guide* **Exploration 2:** Allow students to watch the **interactive glossary page for weather** video, animation, and to look at the images and record what they have found in their notebooks. **Explore 3:** Weather Smart: Heat, Wind, and Pressure and have students draw a diagram in their notebooks of how the three interact. **Explain:** Have students write down what they think affects the weather based on the above explore sessions in their notebooks. [Refer to guiding questions Model Lesson 1: Session 1] **Elaborate:** Teacher Guide: What Shall We Do Tomorrow? What Shall We Do Tomorrow? Interactive Lab Student Recording Sheet: What Shall We Do Tomorrow? **Explain:** After the Explore 3, have students interpret and analyze their data and describe any patterns they see and why these patterns are occurring based on the weather they tested. **Evaluate:** Constructed Response: About Weather

Week	Performance Expectation/DCI	Resource
2 Weather Data PART 1	**3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction. Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change **Teacher Background:** **Weather** is the state of the atmosphere at one time and place, and can include precipitation, temperature, air pressure, and wind speed. **Climate** is the average weather at a location over many years. Climate includes temperature, rainfall, and winds.	**Weather Data: DE Model Lessons** **Guiding Questions:** What tools do meteorologists use to collect weather data? What does each tool measure?How can data be presented so that it describes typical weather conditions? **Engage:** **Video:** Tornado Destruction ask students why they think forecasting the weather is important. How would graphing data go with forecasting? **Video:** The Importance of Weather Forecasting to give purpose to graphing weather data. **Explore1:** **Go to Board and Watch Videos:** Types of Tools Used to Measure Weather Use the Weather Instrument Cards and play a whole group game (choose your own strategy) and then students will cut their own out and glue them in their notebook. **Exploration 2:** Weather Data Game **Exploration 3:** **Video:** Comparing Weather Data Charts **Exploration 4:** **Video :** Weather Graphs ***Continued on next slide...***

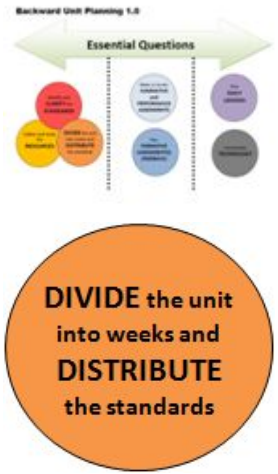


Week	Performance Expectation/DCI	Resource
2 Weather Data PART 2	**3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction. Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change **Teacher Background:** **Weather** is the state of the atmosphere at one time and place, and can include precipitation, temperature, air pressure, and wind speed. **Climate** is the average weather at a location over many years. Climate includes temperature, rainfall, and winds.	**Explain:** The students will take and record precipitation and temperature data daily. Rogers Precipitation Recording Sheet Rogers Temperature Recording Sheet Students and teachers will work together to make a claim and collect evidence about future weather based on current data collected. *Extension- students can research one place they would like to take and record daily precipitation and temperature data.* Precipitation Recording Sheet Temperature Recording Sheet **Elaborate:** Students will analyze their data to see patterns and record their information on page 3 of Hands-On Activity Analysis and Conclusion. **Evaluate:** Watch Video and Have Students Create a Constructed Response Using the DE Writing Prompt Constructed Response Weather Tools

Week	Performance Expectation/ DCI	Resource
3 Weather Data continued Protection from Severe Weather	**3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction. Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change. Weather and Climate Activities/stations Board from DE could be used throughout the unit	**Protection From Severe Weather: DE Model Lessons** **Engage:** Storms on the Plains Activate Prior Knowledge and Create a Chart (see lesson) **Explore 1:** Explore the different types of severe weather and safety procedures using each *BrainPop* video below: Natural Disasters Flooding Tornado Hurricane Thunderstorm **Explain:** How do safety actions protect people in different kinds of severe weather? Complete Session 6 and 7 **Elaborate:** Protection from Severe Weather, Map a Safety Plan with Rubric **Evaluate:** Assessment Probe: Weather Predictors Science Assessment Probes Page Intranet Password Protected

Week	Performance Expectation/ DCI	Resource
4 About Climate	**3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.**	**About Climate: DE Model Lessons** **Engage:** Video: What is Climate? Video: Weather and Climate Create a KLEWS chart on climate (similar to the weather chart) You can also have students glue this chart into their interactive notebooks. **Explore 1:** Read Interactive Text: What is Climate? Go through DE About Climate Session 3 of Model Lesson step by step. **Explore 2:** Read Interactive Text: How Does the Water Cycle Affect Climate? Watch Video: Summary: The Sun, Water Cycle, and Climate. **Explore 3:** Read Interactive Text: How Do Other Factors Affect Climate of a Region Right after, have students explore the Interactive Lab: About Climate and fill out the Student Guide Level 1 **Explain/Evaluate:** Assessment Probes: Coldest Winter Ever & Are They Talking About Climate or Weather? Science Assessment Probes Page Intranet Password Protected DE About Climate Unit Assessment **We will be elaborating during the next session of climate entitled "Types of Climate: DE Model Lesson" next week.**

Week	Performance Expectation/ DCI	Resource
5 Weather Data continued Types of Climate PART 1	**3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.**	**Types of Climate: DE Model Lessons** **Engage:** **Option 1:** Video: Global Climate Zones **Option 2:** Elementary Video Adventures Weather and Climate **Explore: Options...** Climate Postcards Activity Part 2 - Grandma's Postcards World Climates Reading Passage **Explain/Elaborate:** Assign students to a type of climate (you can choose individual, partner groups, or larger groups, depending on your class) Types of climates: • Tropical • Temperate • Polar • Dessert Climate Region Research Project Student Research Organizer Student groups will research a climate region and then create a presentation project on their information. *This will take multiple days because students will be researching on their own. *This can tie into writing, reading, and research standards! ***Continued on next slide...***



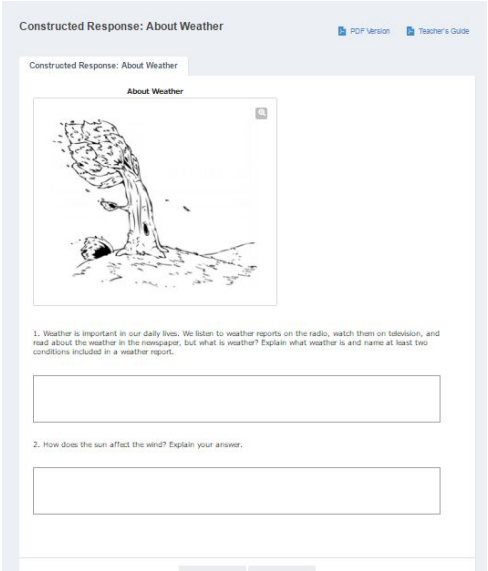
Week	Performance Expectation/ DCI	Resource
5 Weather Data continued Types of Climate PART 2	**3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.**	**Explain/Elaborate continued:** Students will then present on their climate type in front of the class using a board or poster. Students who are listening will use the Types of Climate Matrix to take notes while students are presenting. Summarize student learning together. **Evaluate:** Weather and Climate Assessment

Week	Performance Expectation/ DCI	Resource
6 Creating Design Solution	**3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.*** Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.	**STEM Design Challenge** This design challenge will incorporate everything learned on climate. Discovery Education: Create a Dog House

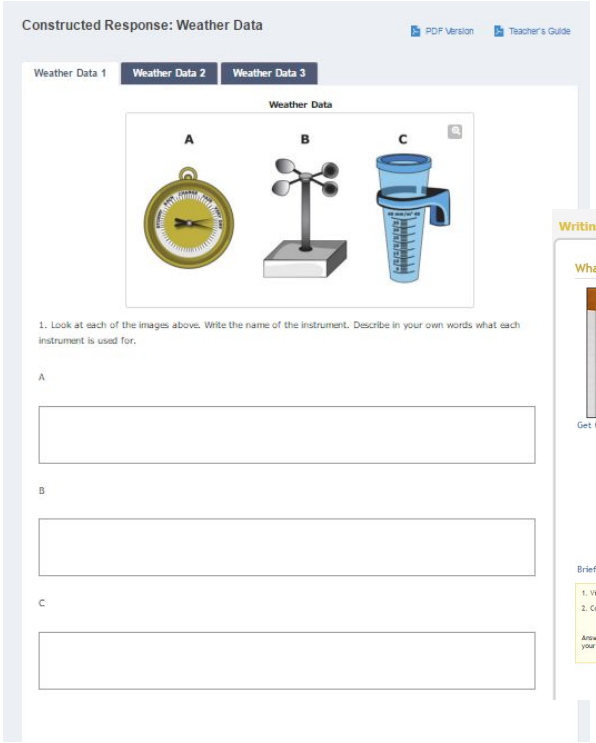
Make or locate SUMMATIVE and PERFORMANCE ASSESSMENTS

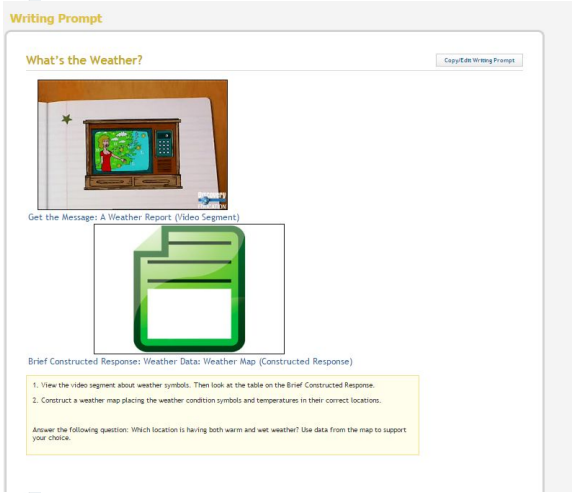
Assessments from Science Techbook Unit Concept:

About Weather



Weather Data

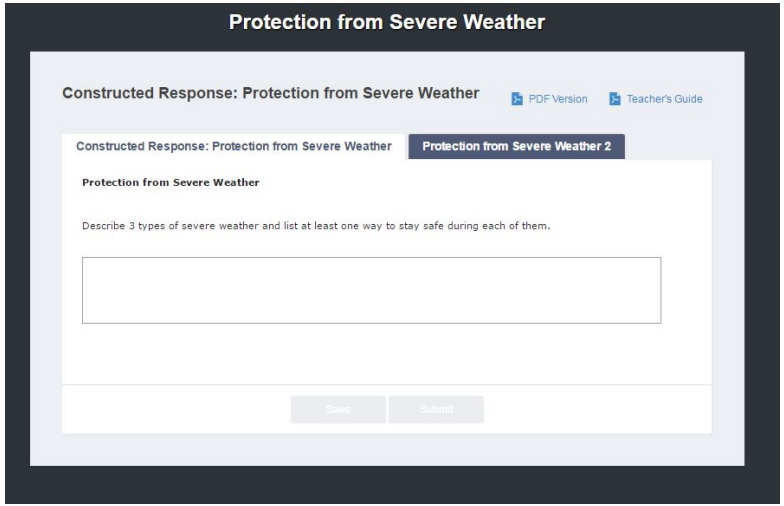


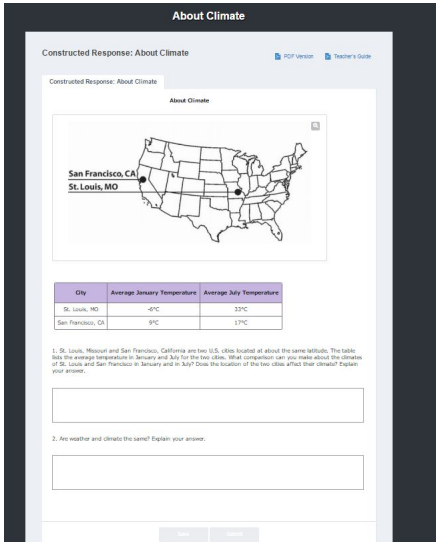


Make or locate SUMMATIVE and PERFORMANCE ASSESSMENTS

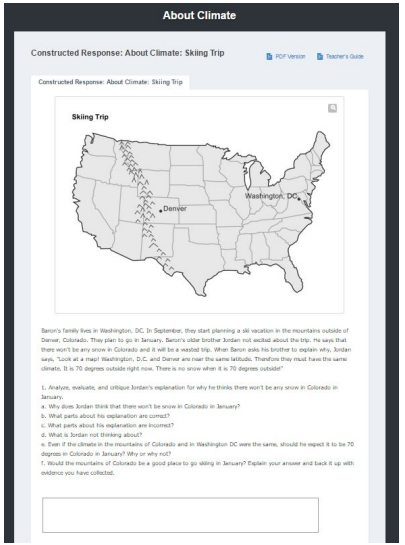
Assessments from Science Techbook Unit Concept:

Protection from Severe Weather





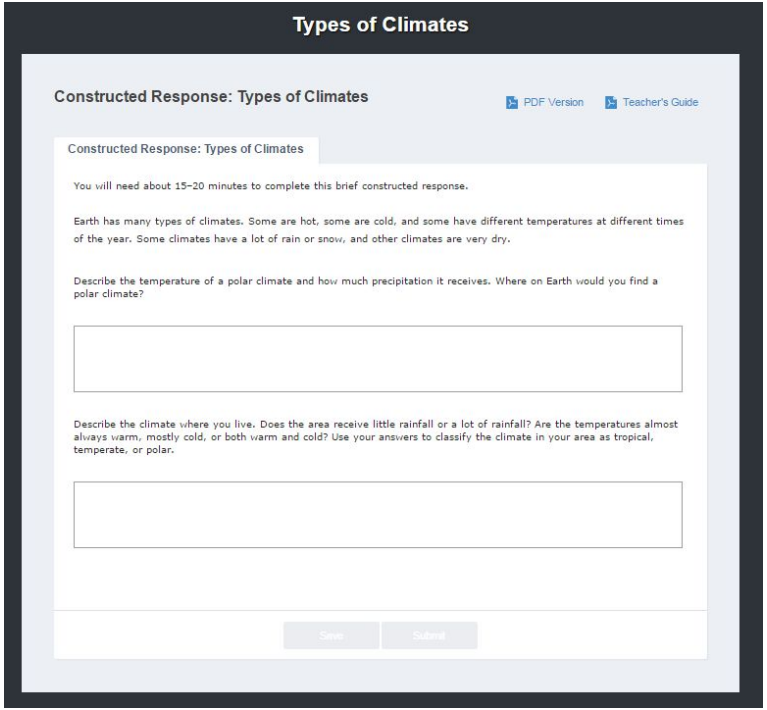
About Climate

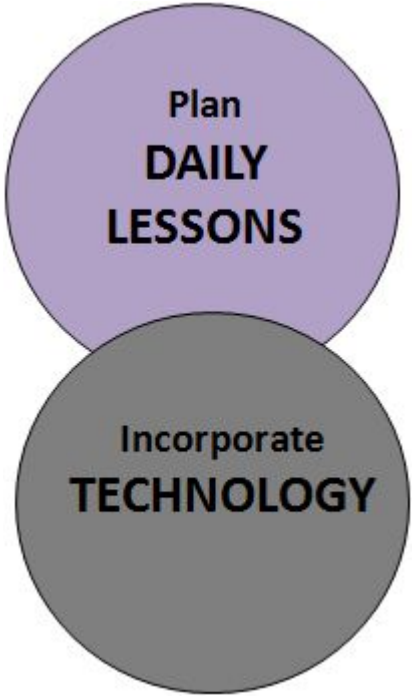


Make or locate SUMMATIVE and PERFORMANCE ASSESSMENTS

Assessments from Science Techbook Unit Concept:

Types of Climates





Additional Resources:

[Weather and Climate Activities/stations Board from DE]
Station activities could be used throughout the unit

[WWW.stemworks.com]

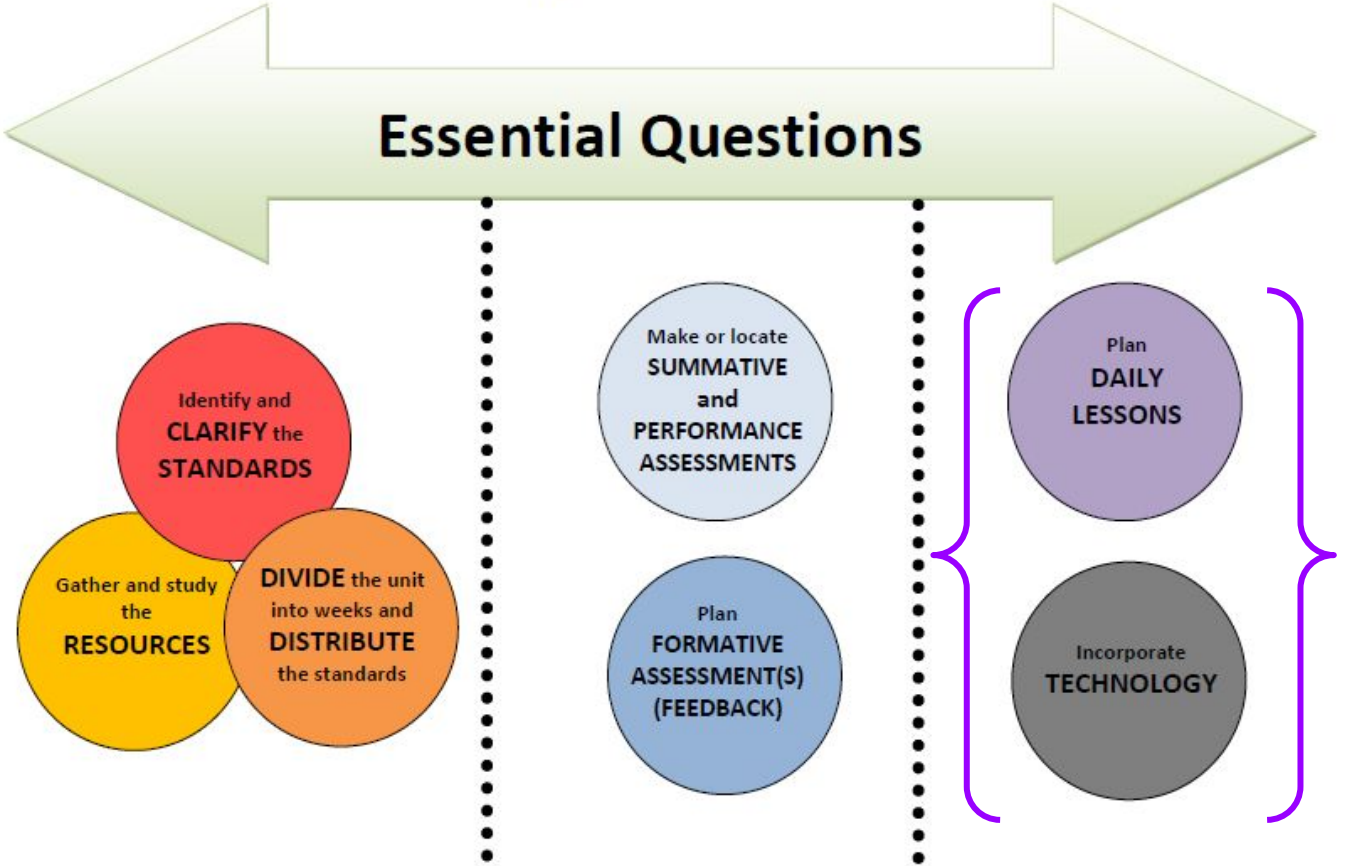
STEM Resources from Discovery Education:

[The Whaddaya Know Quiz Show]
[Science Lab: Weather - Interactive]
[Lightning: Staying Safe-Reading Passage]

Connections To 3rd Grade Literacy Unit

- Sarah, Plain and Tall
  - Drought
  - Fire (cause and effect)
- The Storm -severe weather

Backward Unit Planning 1.0



Now you're ready to plan your daily lessons!