

Unit Title: Weather		Content Area: Earth Systems Science		Grade Level: K	
Unit Summary: Weather introduces students to the concept of weather and to the idea that scientific tools can be used to measure the phenomena they observe with their senses. Students observe weather; use thermometers, rain gauges, and wind scales; record their own data; and discuss their findings on cloud cover, precipitation, wind, and temperature. Students are asked to apply their new skills and knowledge to make predictions about the weather in their area. They compare their own weather predictions to the predictions of the local meteorologist and what actually happens with the weather where they live. The lessons in this unit enable students to appreciate how weather changes and how it affects their daily lives. [NJCCCS 5.4 Earth Systems Science: All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.]					
Unit Essential Questions: <ul style="list-style-type: none"> How do the properties of materials determine their use? How do we know that things have energy? How do changes in one part of an Earth system affect other parts of the system? What is the source of the resources used to meet the basic needs of living organisms? 			Unit Enduring Understandings: <ul style="list-style-type: none"> Students will understand that weather is combination of sunlight, wind, snow, or rain, and temperature in a particular region. Weather varies depending on the time of year and region. Weather patterns can be described and recorded over time. Meteorologists forecast severe weather so that communities can prepare for and respond to these events. 		
Possible Student Misconceptions: Students may have misconceptions regarding clear distinctions between signs of weather and other observations of nature, seasons, and holidays.					
NJCCCS: 5.4.2.F.1., 5.4.2.G.1.					
NGSS Performance Expectations: <i>Students who demonstrate understanding can...</i> <ul style="list-style-type: none"> 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. 					
Primary CCSS ELA/Literacy Connections: SL.1.1,SL.1.2, SL.1.3, SL.1.4, SL.1.5, SL.1.6				Primary CCSS Mathematics Connections: K.MD.A.1, K.MD.B.3	
Lesson Pace & Sequence					
Lesson Title/Number: Sharing What We Know about Weather?/Lesson 1		Learning Objective(s): Students will observe and describe today's weather, how they decide what to wear to school each day, and organize information about their favorite types of weather on a class graph.		Lesson Duration: 1 week/200 Minutes	
Learning Cycle <i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i> <i>*Elements do not have to be in conducted in sequence.</i>	Learning Activities <i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i>	Resources/Materials <i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i>	Science and Engineering Practices <i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i>	Disciplinary Core Ideas <i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i>	Crosscutting Concepts <i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i>
Engage: <i>How will you capture students' interest and get students' minds focused on the concept/topic?</i>	Teacher will ask students, "What is the weather like today?". The class will be focused on this specific topic instead of opening a discussion about weather in general. Record on "What Is The Weather Like Today?" chart paper.	<ul style="list-style-type: none"> Chart Paper 		Weather is the combination of sunlight, wine, 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. (K-ESS2-1)	

<p><i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i></p> <p><i>*Elements do not have to be in conducted in sequence.</i></p>	<p><i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i></p>	<p><i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i></p>	<p>Practices</p> <p><i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i></p>	<p><i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i></p>	<p><i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i></p>
<p>Elicit: <i>How will you access students' prior knowledge?</i></p>	<p>Read "Observing the Weather with a Meteorologist" and What Is Weather?" as well as other text about stormy weather (See resources/materials) Encourage students to use their 4 senses (seeing, hearing, touching, smelling) when observing weather</p>		<p>Obtaining, Evaluating, and Communicating Information</p> <p>Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).</p>		
<p>Engage: <i>How will you capture students' interest and get students' minds focused on the concept/topic?</i></p>	<p>Show pictures/illustrations/media of stormy weather</p>	<ul style="list-style-type: none"> Weather Story: http://www.bbc.co.uk/cbeebies/balamory/stories/balamory-weatherstory/ Weather Webquest: http://warrensburg.k12.mo.us/webquest/weather/index.htm 		<p>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. (K-ESS2-1)</p>	<p>Patterns</p> <p>Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.</p>
<p>Explore: <i>What hands-on/minds-on common experience(s) will you provide for students?</i></p>	<p>Have students use watercolors to paint pictures of storms and have them dictate a sentence or two about their pictures (can be used as bulletin board or class book)</p>		<p>Planning and Carrying Out Investigations</p> <p>With guidance, plan and conduct an investigation in collaboration with peers (for K).</p>	<p>Wind and water can change the shape of the land (2-ESS2-1)</p> <p>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. (K-ESS3-2)</p>	
<p>Elaborate: <i>How will students apply their learning and develop a more sophisticated understanding of the concept/topic?</i></p>	<p>Students will then be asked to show their model of storms to their selected peers, group, or whole class and communicate why they depicted storms the way they did</p>				

Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Students will then record their observations of the weather today on the Weather Observations Chart (see resources/materials)	<ul style="list-style-type: none"> STC p18-19 			
Extend: How will students deepen their conceptual understanding through use in new context?		<ul style="list-style-type: none"> Kindergarten Science: http://colaborativelearning.pbworks.com/w/page/32112575/Kindergarten%20Science 			

Lesson Pace & Sequence

Lesson Title/Number: Reading a Thermometer/Lesson 3	Learning Objective(s): Students observe and discuss thermometers as tools that measure temperature.	Lesson Duration: 1 week/200 minutes
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Learning Cycle	Learning Activities	Resources/Materials	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i> <i>*Elements do not have to be in conducted in sequence.</i>	<i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i>	<i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i>	<i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i>	<i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i>	<i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i>
Elicit: How will you access students' prior knowledge?	Ask the class what they know about thermometers... Where have you seen thermometers before? What does a thermometer tell you? What do you think the numbers on a thermometer mean? Etc.			Sunlight warms Earth's surface. (K-PS3-1), (K-PS3-2)	

<p>Engage: How will you capture students' interest and get students' minds focused on the concept/topic?</p>	<p>Show students "Thermometers in our World" to encourage more class discussion and elaboration.</p>	<ul style="list-style-type: none"> • Thermometers in our World – (TE p. 45) 	<p>Obtaining, Evaluating, and Communicating Information</p> <p>Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).</p>	<p>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. (K-ESS2-1)</p>	<p>Patterns</p> <p>Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.</p>
<p>Explore: What hands-on/minds-on common experience(s) will you provide for students?</p>	<p>Distribute thermometers to students and allow a few minutes for them to observe these new tools (invite them to share their observations). Ask students to gently place their thumbs on the red bulb at the bottom of the thermometer and describe what they observe and why they think the fluid is moving</p>			<p>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. (K-ESS3-2)</p>	
<p>Explain: How will you help students connect their exploration to the concept/topic under investigation?</p>	<p>Let students know that the red fluid in the thermometer tube is sensitive to temperature and that it moves up when it gets warmer and down when it gets colder. Explain that each line on the scale stands for two numbers, even though the numbers are not all written on the scale (numbers below zero are used to show temperatures that are very cold).</p>				
<p>Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?</p>	<p>Take a shoelace and move it to demonstrate different temperatures, give children the opportunity to read each temperature, and then allow them to split into groups and question each other.</p>	<ul style="list-style-type: none"> • Shoelace • Large Model Fahrenheit Thermometer (TE p.46-48) 			

Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Students will record on STC Record Sheet 5-A p.44. Look at each student's completed copy; did the students record the temperature shown on the thermometer? To the nearest 10? Nearest 2?				
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Lesson Pace & Sequence

Lesson Title/Number: Comparing Inside and Outside Temperatures/Lesson 4	Learning Objective(s): Students record indoor and outdoor temperature and compile a class graph.	Lesson Duration: 1 period/40 minutes
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Learning Cycle <i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i> <i>*Elements do not have to be in conducted in sequence.</i>	Learning Activities <i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i>	Resources/Materials <i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i>	Science and Engineering Practices <i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i>	Disciplinary Core Ideas <i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i>	Crosscutting Concepts <i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i>
Elicit: How will you access students' prior knowledge?	Ask students to think about the temperature inside the classroom and the temperature outside today. Do they think the two are the same or different? Is it warmer outside then it is inside today, or colder? How could they find out?				
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Distribute a red crayon and Record Sheet 7-A Recording the Temperature inside then have the students wait 2 minutes and ask them to read the temperature and record it. Then students will share their results and explain them.	<ul style="list-style-type: none"> Record Sheet 7-A and 7-B (TE p.60-61) Red Crayon 	Obtaining, Evaluating, and Communicating Information Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).	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. (K-ESS2-1)	Patterns Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

Explore: What hands-on/minds-on common experience(s) will you provide for students?	Take the students outside with their thermometers and red crayon. Have the students measure and record the outside temperature. Make sure the thermometers are not in direct sunlight.			Sunlight warms Earth's surface. (K-PS3-1), (K-PS3-2)	
Explain: How will you help students connect their exploration to the concept/topic under investigation?	Once back in the classroom have students look at Record Sheets 7-A and 7-B side by side. Have them compare the two temperatures and help them recognize that only the outside temperature tells them what the weather is like. Ex) Are these temperatures the same? Which is hotter? Which is colder? Why do you think the inside temperature is lower or higher? Which temperature tells us more about today's weather? Why?	<ul style="list-style-type: none"> Record Sheet 7-A and 7-B (TE p.60-61) 			
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Teacher will assess student mastery through students' verbal responses, anecdotal notes, and participation/explanations of investigations/observations (See Resources/Materials).	<ul style="list-style-type: none"> TE p.116 			
Extend: How will students deepen their conceptual understanding through use in new context?	On one large sheet of graph paper, create a "Temperature Graph" and record each day's temperature to refer back to, assign "class meteorologists", extend for various homework assignments, etc.	<ul style="list-style-type: none"> Chart Paper/Graph Paper 			

Lesson Pace & Sequence

Lesson Title/Number: Observing Clouds/Lesson 5	Learning Objective(s): Students observe, draw, and discuss cloud formations.	Lesson Duration: 1-2 periods/40-80 Minutes
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<p>Learning Cycle</p> <p><i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i></p> <p><i>*Elements do not have to be in conducted in sequence.</i></p>	<p>Learning Activities</p> <p><i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i></p>	<p>Resources/Materials</p> <p><i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i></p>	<p>Science and Engineering Practices</p> <p><i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i></p>	<p>Disciplinary Core Ideas</p> <p><i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i></p>	<p>Crosscutting Concepts</p> <p><i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i></p>
<p>Elicit: <i>How will you access students' prior knowledge?</i></p>	<p>Write the word "Clouds" on the sheet of newsprint. Encourage students to say what the word makes them think of and record their comments on the web.</p>			<p>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. (K-ESS2-1)</p>	<p>Patterns</p> <p>Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.</p>
<p>Explore: <i>What hands-on/minds-on common experience(s) will you provide for students?</i></p>	<p>Take the students outside and allow 5-10 minutes for students to observe the clouds in the sky. Encourage them to notice what the clouds are shaped like, how high they are, and what familiar things, such as animals, the cloud formations call to mind.</p>		<p>Obtaining, Evaluating, and Communicating Information</p> <p>Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).</p>	<p>Sunlight warms Earth's surface. (K-PS3-1), (K-PS3-2)</p>	
<p>Explain: <i>How will you help students connect their exploration to the concept/topic under investigation?</i></p>	<p>When you are back in the classroom have students share their new ideas about clouds and add these ideas to the web using a marker of different color so that comparisons can be made between their ideas before and after they observed the sky.</p>			<p>Wind and water can change the shape of the land (2-ESS2-1)</p>	

<p>Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?</p>	<p>Pass each student blue construction paper, glue, cotton balls, and pencils. Ask students to draw a picture of one cloud they observed. Then they can glue cotton balls on their pictures to make three-dimensional clouds. Allow students to report out to their peers either in a whole group setting or small groups.</p>	<ul style="list-style-type: none"> • Blue Construction Paper • Cotton Balls • Pencils 			
<p>Evaluate: How will students demonstrate their mastery of the learning objective(s)?</p>	<p>Teacher will assess student mastery through students' verbal responses, anecdotal notes, and participation/explanations of investigations/observations.</p>				

Lesson Pace & Sequence

<p>Lesson Title/Number: Classifying Clouds/Lesson 6</p>	<p>Learning Objective(s): Students sort cloud pictures using their own systems and according to three defined cloud types-stratus, cumulus, and cirrus.</p>	<p>Lesson Duration: 2-3 periods, 80-120 Minutes</p>
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<p align="center">Learning Cycle</p> <p align="center"><i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i></p> <p align="center"><i>*Elements do not have to be in conducted in sequence.</i></p>	<p align="center">Learning Activities</p> <p align="center"><i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i></p>	<p align="center">Resources/Materials</p> <p align="center"><i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i></p>	<p align="center">Science and Engineering Practices</p> <p align="center"><i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i></p>	<p align="center">Disciplinary Core Ideas</p> <p align="center"><i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i></p>	<p align="center">Crosscutting Concepts</p> <p align="center"><i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i></p>
	<p>Read STC Literacy Series, Weather, "Looking At Clouds"</p>	<ul style="list-style-type: none"> • Read STC Literacy Series, Weather, "Looking At Clouds" p28-29 		<p>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. (K-ESS3-2)</p>	

<p>Engage: How will you capture students' interest and get students' minds focused on the concept/topic?</p>	<p>Group students into small groups and give each group a set of nine cloud photographs. Challenge each group to sort the photographs into categories, putting clouds that look alike in each category. Then have students give each cloud group a "name".</p>		<p>Obtaining, Evaluating, and Communicating Information</p> <p>Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).</p>	<p>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. (K-ESS2-1)</p>	<p>Patterns</p> <p>Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.</p>
<p>Explore: What hands-on/minds-on common experience(s) will you provide for students?</p>	<p>Students will then explain their classification reasoning to their peers and walk around the room to see other group's classification and reasoning.</p>				
<p>Explain: How will you help students connect their exploration to the concept/topic under investigation?</p>	<p>Show students the "Cloud Classification Chart" and point out the words stratus, cumulus, and cirrus.</p>	<ul style="list-style-type: none"> STC Cloud Classification Chart (TE p. 118) 			
<p>Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?</p>	<p>Ask students to look at the cloud photographs again and to organize the photographs according to the three categories showing on the "Cloud Classification Chart". Then ask students to brainstorm words they would use to describe each type of cloud and record on the "Cloud Classification Chart", for students to refer back to as needed.</p>				
<p>Evaluate: How will students demonstrate their mastery of the learning objective(s)?</p>	<p>Teacher will assess student mastery through students' verbal responses, anecdotal notes, and participation/explanations of investigations/observations. (See Resources/Materials)</p>	<ul style="list-style-type: none"> TE p. 116 			

Lesson Pace & Sequence

Lesson Title/Number: Summarizing Our Weather Observations/Lesson 7		Learning Objective(s): Students review and discuss weather data; then use their data to summarize characteristics of the weather over a long period of time.			Lesson Duration: 1 week/200 Minutes	
Learning Cycle	Learning Activities	Resources/Materials	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts	
<i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i> <i>*Elements do not have to be in conducted in sequence.</i>	<i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i>	<i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i>	<i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i>	<i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i>	<i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i>	
Elicit: How will you access students' prior knowledge?	Ask students what the weather was like two weeks ago. Invite one student to use the data recorded thus far to describe the weather.					
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Have students use their record sheets to summarize the weather that was recorded from the Weather Calendar.	<ul style="list-style-type: none"> • Post-Its (optional) • Student Weather Tally p.132 		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. (K-ESS2-1)	Patterns Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.	
Explore: What hands-on/minds-on common experience(s) will you provide for students?	Students can record their responses on a post it and place their responses on the "Class Weather Tally" Chart.	<ul style="list-style-type: none"> • STC Class Weather Tally Chart 	Obtaining, Evaluating, and Communicating Information Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).	Wind and water can change the shape of the land (2-ESS2-1)		

<p>Explain: How will you help students connect their exploration to the concept/topic under investigation?</p>	<p>To help students summarize the data from the "Class Weather Tally" chart discuss some of the following questions: How many days were sunny? Which type of cloud cover was most common? Which type of cloud cover was least common? Were there any types of precipitation that did not occur at all? How often was there no wind at all? How often was there some wind or strong wind?</p>			<p>Sunlight warms Earth's surface. (K-PS3-1), (K-PS3-2)</p> <p>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. (K-ESS3-2)</p>	
<p>Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?</p>	<p>Students will summarize all this data by writing summary statements. For example, The weather during the weather unit was mostly sunny with a few raining days. Encourage students to look at the list of questions about weather; which questions have been answered? Which questions have not been answered?</p>				
<p>Evaluate: How will students demonstrate their mastery of the learning objective(s)?</p>	<p>STC Post Unit Assessment</p>	<ul style="list-style-type: none"> • STC Weather-Post Unit Assessment (TE p. 57-66) 			
<p>Extend: How will students deepen their conceptual understanding through use in new context?</p>	<p>Teacher hands out STC Weather Super Meteorologist Award to the students and celebrates their work as meteorologists!</p>	<ul style="list-style-type: none"> • TE p. 133 			