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Weather and Building Knowledge

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Introduction

"Brrr!" The idea of a crisp winter morning brings to mind specific sights, sounds, smells, and even a chill to the skin and a desire for a soothing hot beverage. For many people, recalling a cold winter experience means remembering snow as part of the sights. Others may recall a very different cold winter experience. If I talk with my five- and six-year old students about the weather and mention snow, very few will have any experience with that word or concept yet. My students, like myself, live in "Sunny California" where the range of weather is very limited. Thus, as young Kindergarten students, their experience and prior knowledge of "snow" are close to non-existent. This is just one example in identifying their struggle with comprehension and expression without a basis of meaningful experience and vocabulary. Amusingly to me, young children, with their curious eyes, hands, and bodies, seek to understand the world around them, and they are naturally intrigued by science. This is one of the reasons why I can't wait to introduce a unit that will focus mainly on science standards, using strategies to connect images and words for deeper comprehension of weather and how it affects the world and earth's inhabitants.

In teaching Kindergarten in East San Jose, I find each year a wider gap between the prior knowledge students already have and the academic skills they must master. In the past, I've been faithful to our district-adopted curriculum and followed the plans as scripted – with allowances for flexibility in differentiation as needed for students. I've used as a mantra "I Do, We Do, You Do" when mentoring my student teachers on gradual-release methods. These wonderful and thoroughly researched strategies — to model expectations (I Do)-practice expectations together with guidance (We Do)-allow students to perform independently (You Do) — are very helpful and energizing, especially when it is the students' turn to be "independent" workers. I love monitoring this portion of each lesson to check their comprehension as students explain their work in progress. I am, however, even more thrilled to implement project-based lessons and methods that sometimes start with students trying things out right away without all the front loading. Part of project-based learning allows teachers to facilitate while students explore concepts with their own curiosity and inquiry leading their learning rather than a teacher-led process. (Please see the link to Project Based Learning in the Teacher Resources for more information.) I will also be able to creatively implement more technologically infused lessons to bridge students' limited prior knowledge with the literacy they'll need to build a depth of knowledge regarding the topic of weather.

Rationale

For most of my students, Kindergarten is their first experience with academic language, skills development, and a structured environment for learning. All are second language learners explicitly developing their English language speaking skills. Using visual images greatly supports their learning and provides better comprehension-building opportunities. Combining that with the use of meaningful vocabulary will help them better express themselves when speaking and writing. Students will learn to comprehend content with a depth of knowledge and learn key vocabulary in this weather unit so that they can fill the gaps in prior knowledge. This unit will combine visual literacy strategies with hands-on experience to strengthen students' knowledge base. The strategies will be explained, and then implemented in student projects and activities. I have included a few sample lessons in Classroom Activities. Please use any part of this weather unit including the links, and adjust lessons to your own students' needs. Every school has its unique qualities.

Mount Pleasant Elementary School is part of a small community in the eastern foothills of San Jose, California. It serves students Kindergarten through fifth grade with general education, English Language Development (ELD), intervention, a Reading Partners program, and an after-school program. The school is primarily Hispanic/Latino (94%) with few of Vietnamese, Cambodian and Chinese descent (4%), and even fewer Caucasian (2%). It is currently in its fourth year of Program Improvement and is restructuring into a "themed" STEAM (Science, Technology, Engineering, Arts, Math) school. I look forward to helping all these students develop into leaders and creative problem-solvers by teaching critical thinking skills across all subject areas, even though the focus for this first year is on the science theme. In looking through all our Kindergarten standards, I find that the phrase "build on prior knowledge" is quite general, and difficult for teachers to do when prior knowledge of five-year olds is minimal. Some may question what prior knowledge then should a four or five year old possess upon entering Kindergarten? What prior knowledge is common among this young age?

There is ongoing research into Kindergarten Readiness and Preschool. For example, in a study by Hatcher, Nuner, and Paulsel reported in "Kindergarten Readiness and Preschools: Teachers' and Parents' Beliefs Within and Across Programs," they found six main concerns from parents and educators regarding Kindergarten Readiness. When summing up their findings, they cited "social and emotional factors as the core of readiness, combined with perceived academic components such as literacy skills." The literacy skills they mention include "letter recognition, sound/letter association, recognizing sight words, and names, and writing - especially the ability to write one's own name." ¹ To be honest, my students do not come to school with most of the above-mentioned literacy skills. I have found that it is not just my students who lack these important skills: it is the same situation beyond East San Jose.

Research uncovers more insight into our plight: "More and more children arrive in kindergarten never having been read to, not knowing how to hold a book, unaware of what to do with the letters that could spell their own names. 'Although the average child in the United States has had approximately 3,000 hours of pre-school language literacy experience at home before entering the 1st grade, the ever-growing population of at-risk children averages only 260 hours of such experience.'" ² Sarah D. Sparks shares in her article in *Education Week* that, according to a study by Hart and Risley, children from well-off families have a working vocabulary of 1,116 words, compared to 749 words for children in working-class families, and 525 words for children whose families are on welfare. She goes on to quote them as saying, "The consensus among researchers and educators has been that students must close such vocabulary gaps to succeed academically and deal with

rigorous content." ³ This unit will provide fun ways to connect images and key vocabulary words to help fill the gap our students face when trying to gain a deeper understanding of weather and the world around them.

When I began researching and writing this unit, I believed that more students over the years began Kindergarten with less academic readiness. This was the premise for addressing the problem teachers of young children have in "building on [students'] prior knowledge" as required in our standards. I still believe it because of my research; however, I have also realized that incoming students may unknowingly have a different set of skills centered on and around various modes of technology that may not match our traditional academic requirements and teaching styles. This is an important insight on which both teachers and students can build.

Technology is something many of my students have experienced in their personal lives through interactive games on their parents' smart phones, tablets, home consoles, and hand-held devices. As teachers we can embrace what Burmark says, "The workplace landscape is changing dramatically, corresponding to the frenetic pace of technological progress." ⁴ I plan to integrate teacher and student use of technology into this unit to build knowledge in meaningful and relevant ways. Of course, adjustments can be made according to what technology is available at your school. In order to instill our school's vision, "to be a high-achieving school and to set students on the path to the university," ⁵ there is much needed to bridge the gap and build a solid foundation of academic skills preparing students for the twenty-first century college and career path. In this unit, project-based learning, along with strategic integration of visual literacy techniques and technology, will enhance student comprehension regarding weather concepts.

Content Objectives

This weather unit mainly addresses Science standards, although it also covers many other standards, including: California State Standards for English Language Arts and Math, California Department of Education English Language Development Standards, and Common Core Standards. Students will understand different kinds of weather, the water-cycle, scientific experiments, seasons, and attributes affecting the world and earth's inhabitants. Throughout this unit, hands-on projects and the dual focus on images and words together for learning vocabulary will help bridge the "prior knowledge" gap. Students are expected to master basic skills of speaking and writing Narrative, Informational, and Opinion pieces throughout this Kindergarten year. By the end of this unit, students will be able to explain weather by producing verbal, illustrative, and written work.

This weather unit is a fun way to teach the content while also addressing the issue of teachers having to increase overall comprehension despite students' limited vocabulary and prior knowledge of basic concepts. Strategies of building knowledge can be applied to other lessons and units since they help teachers and students gain a depth of understanding. Teaching students systematically and explicitly how to make connections will build their comprehension and knowledge, which then build their prior knowledge for future learning. As seen in most standards and in research, building on students' prior knowledge is key.

Furthermore, Burmark states, "Activating students' prior knowledge is a critical comprehension strategy." ⁶ Students will continuously build and activate their knowledge in significant ways.

Relevant modes of learning about the weather content that reflect technological advances are imbedded in

this unit to enrich comprehension. Research on visual literacy and visual learning allows for up-to-date strategies to make learning more meaningful to students in this global, technological society. Bazeli and Olle point out that engaging methods for students actively developing vocabulary include technology such as interactive video, computer software packages, graphic organizers, story maps, and collaborative practice of new vocabulary, all activities that which can all be done dynamically ⁷ . Updated strategies in relation to weather images, text, and experiments make learning more meaningful to students in this tech-savvy society.

Background

The ideas and research in this weather unit involve visual literacy, visual language, semiotics, and mental imagery. In the seminar given by Professor Janice Carlisle, titled Picture Writing, she led our group in studying the relations between words and images, how they are in conflict with one another, and perhaps that there are no visual images without words and no writing without mental images. The ideas, research, and an engaging observation method gained from this seminar are what I will integrate into this creative unit to address the goals of teachers who are building and activating prior knowledge, and to meet the needs of my students.

Although my students may have limited prior knowledge in the academic area, they still grow up surrounded by visual images connecting to personal experience and important learning. Visual Literacy is the ability to recognize and understand ideas conveyed through visible actions or pictures. Along the same lines, Lynell Burmark explains symbols and images like this: "They are visual mnemonics - memories of life experiences and feelings recaptured through nonverbal means." ⁸ Applying visual literacy to the learning of key weather symbols and mnemonics for this unit will establish a rich understanding of the content. Explicitly observing and gathering data through senses during hands-on weather experiments and projects will add to students' visual mnemonics. Visual Language is discussed as the means in which students create, think, and receive information. Students this young are still developing their vocabulary to express themselves, and have yet to learn how to read and write using letters and words. Expression through drawing, however, is age appropriate and an important part of visual language. "Drawing in connection with vocabulary provides children with the means to think in the language by which they receive much of their information, that being the visual language." ⁹ An integral part of student activities and projects are their display of weather knowledge through illustrations (and verbal explanation). Bazeli and Olle conclude, "Visuals have great impact on students' lives, and can be useful tools to develop vocabulary and reading comprehension skills. ¹⁰ Teachers, be encouraged to model your own expression of weather concepts in illustration, computer drawing programs, drama, or video clips.

We can naturally apply these tools to enhance the lessons in this weather unit. Soundy and Drucker, however, speak in depth about teachers using visual language as a process that they call the semiotic process. They explain that it involves student illustrations connected to students' experiences of everyday life and personal interests, and that it creates an interactive sociocultural environment. They state that, "Drawing can be seen as a meaning-making process in which children produce signs to express their understanding and ideas in visual-graphic form and engage their emotions and imaginations." Practicing inquiries before having students draw, finding details in their illustrations, and engaging in conversation allowing them to explain and express their understanding of weather will solidify this knowledge base. Using these strategies helps "strengthen

teachers' understandings of drawing, sharpen their interpretation skills, and equip them to enable children to use graphics as powerful learning and thinking tools in interactive social environments." ¹¹ Empowering students with visual literacy and language strategies will facilitate their natural curiosity and interest, constructing even more comprehension of this new weather knowledge.

Developing mental imagery is another strategy from research to help connect mnemonics, words, and pictures to support comprehension. Imagery is created when a person internally proposes and constructs representations of external objects or events. Timothy Rasinski believes imagery can aid in reading comprehension. He explains in detail that imagery involves symbols that can be unique for each person, but language represents by using signs. He continues by explaining that signs are uniform symbols among groups of people, whereas, language can only represent only concepts and tangible objects. Rasinski describes imagery as complementary to language in assisting comprehension. ¹² In this weather unit, we'll have large group activities that use imagery. For example, students will be able to listen to language and words in order to develop images in their minds of a sunny (rainy, windy, etc.) day outside on the playground before they are instructed to transfer the images onto paper or verbally describe using experience through their senses. Developing imagery is a powerful strategy to connect key weather vocabulary with comprehension.

Teaching Strategies

I look forward to the many strategies that will be implemented in support of building students' knowledge, including connecting text to students' own previous knowledge and explicitly teaching them how we do this. We will work on observation and interpretation methods with weather images and key vocabulary through hands-on projects. Students will explore imagery and the relation of words and images to help their comprehension with weather activities and experiments. Technology will be infused into our lessons to keep learning up to date and relevant for students.

Prior Knowledge

Using strategies to connect weather images, texts, and experiences allows opportunities for assessments and filling gaps in prior knowledge. Students will be explicitly taught how strategies of connecting text to their own previous knowledge help their comprehension of weather concepts. They will learn how they are building more and more of their own prior-knowledge. An article in Pearson Education, Inc. explains that, "When students learn to make connections from their experience to the text they are currently reading, they have a foundation, or scaffolding, upon which they can place new facts, ideas, and concepts. ¹³ We will move through this process of constructing connections with each prior-knowledge strategy. I will model each type; then we will explore it. For instance, text-to-self is how students think out loud when reading words, so we'll work on making connections between the text and their own experience. Text-to-world is finding out what students know about the world and making personal connections to it. Text-to-text is how a book relates or reminds us of another book. We will be using different big books and trade books about weather for these activities.

Key Vocabulary

Making weather vocabulary connections meaningful requires experiencing an image by thinking about it and verbally expressing what comes to mind in both new descriptions and previous memories recalled by that

image. We will use methods of observation to describe what students see in an image, first without interpretation. Students will learn observation skills when looking at an image, then interpretation skills, and, finally exploration skills of key vocabulary words to connect image with text. I will also use this strategy to assess prior knowledge by using observation when showing images without text for key weather vocabulary, for example, sunny, foggy, cloudy, windy, rainy, and stormy. I will closely monitor how students explain their thinking and interpretations during these activities and then teach students key weather vocabulary to connect images with key vocabulary words throughout the unit.

Internal Image

Another strategy involves text only to discover what images students recall or build in their mind. For instance, I will show students cards with key weather vocabulary to see if they recall any prior knowledge or recognize any of the text. Exploration of students' interpretations in activities will help in making connections with vocabulary. Internal imagery can connect key weather images to experiences and therefore help teachers discover how students recall and describe using their senses. Next, I will present students with weather images to connect to key vocabulary. Finally, I will monitor students to coach them in speaking in complete sentences to verbally describe experiences and images they recall. Bazeli and Olle suggest that young students use visual and multimodal texts and multiple modes of representation in their daily literacy activities.¹⁴ Throughout the unit I will integrate technology to also support making connections with mnemonics and visual literacy activities.

Using Technology

Since many young students have experienced technology in their personal lives, even - five-year olds, I will use this as a strategy and technique to fill the gap in meaningful and relevant ways with weather content. There are many technological products that can be incorporated for individual, small-group, and large-group use. Engaging students with the different and creative video methods such as captioned vocabulary words and pictures or live-action to illustrate vocabulary are fun ways to develop vocabulary and comprehension. Videos created with help from adult volunteers or older-buddies will be used for individual or small group activities. I will use my projector often for small-and large-group activities. Recently, we have begun using iPads at our school for all three kinds of activities, and will continue to do so with this weather unit. The technology we most use involves the iMac computers in the school's computer lab (and sometimes a main classroom computer). There is a wealth of wonderful free academic programs and online options for free access with computers. I've included several websites for these in the Teacher Resources and Student Resources sections of this unit. Bazeli and Olle remind us that, "The process of creating an accompanying visual provides practice with new vocabulary, and promotes encoding of that new vocabulary into long-term memory."¹⁵ This can be done creatively using technology as a strategy. Technology seems to provide unlimited resources whether to help fill gaps in student learning or to help make assessments more focused and relevant.

Comprehension Assessments

There are various ways, including technological ways, to assess student comprehension of weather concepts in individual and small-group activities. For example, a drawing program supports students in visualizing, verbalizing, and writing when retelling a story. "The visual retelling of a story is a wonderful way to vary the informal assessment of comprehension."¹⁶ It can also be the retelling of a weather experiment, or a retelling of an imagery experience of weather that is assessed. Of course, physically drawing or creating visual

representation to retell a story can be used with different mediums for assessing comprehension of weather concepts. It can simply be using paper and pencil or crayons to create an illustration to assist in students' verbal retell. One assessment I look forward to providing involves paintings and images that I will show on the projector or class computer depicting weather scenes for students to apply observation, verbal, and writing skills expressing their knowledge of weather and its effect on the world and earth's inhabitants.

Classroom Activities

In the introduction to weather, students will use visual vocabulary words from our curriculum, and will engage in well-researched and traditional activities connecting meaning to words and pictures. They will also, however, learn science standards by participating in three main projects to connect personal experience to key vocabulary: 1. Create precipitation in the science lab; the objective is "I can explain evaporation using newly acquired vocabulary and images." 2. Create snow in the science lab; the objective is "I can explain the process of Investigation and Experimentation, using newly acquired vocabulary and images." 3. Create a weather report using technology; the objective is "I can tell you about the weather and how it affects us using new vocabulary and images."

In small groups before our discussion of weather, I will assess students' prior knowledge of weather by using cards with basic iconic images (sun, fog, cloud, wind, rain, storm) without text. This assessment will reveal if any extra scaffolding and differentiation is necessary in my teaching throughout the unit. All students will have access to fun weather activities and learning opportunities, and some will have extra support to comprehend weather content.

I hope you will use the links to fun weather songs, finger plays, and videos throughout the unit, for instance, "How's the Weather?" on You Tube. ¹⁷ These resources will light-heartedly engage the students and enhance their learning experience. I've included several links to websites in the Teacher Resources and Student Resources. This is an important note: all the activities and lessons can fit in a variety of places in the unit, and should be repeated as often as time allows as it fits your needs.

Classroom Activity 1

The readings for this week come from big books called "A Rainy Day" by Robin Nelson and "What's the Weather?" from the Success For All curriculum to display kinds of weather. I will also use the trade book "What Makes The Weather?" by Danilo Palazzo.

Students will engage in activities connecting meaning to words and pictures with kinds of weather in visual literacy centers. They will use iconic representations for each common type of weather to practice vocabulary words: sunny, foggy, cloudy, windy, rainy, stormy. Using visual aids is key in vocabulary instruction and reading comprehension as indicated by research in "Using Visuals to Develop Reading Vocabulary" by Bazeli and Olle.

With help from their buddy class, students will use technology to create and discuss a class graph showing their favorite type of weather. We will use the Mentimeter website for creating this class graph in real-time.

Students will also get to explore with the Precipitation science experiment. The objective being, "I can explain

evaporation using weather vocabulary and images." This will use jars (some covered, some uncovered) filled partially with water. The vocabulary words to connect with experiment are: weather, rain, air, vapor, evaporation, precipitation, accumulation, heat, warm, and cool.

Make It Rain!

Objective: "I can explain the water cycle using my new weather words." Students will learn through the Precipitation experiment about water and weather. They will be able to use key vocabulary words to explain the process of the water cycle and the reasons for rain.

Materials: 2 clear jars, 1 cover, hot water

Procedure: In the science lab (or classroom), students will be divided into groups. Everything must have an intentional and easy-to-see text label. Each group will observe their two jars of water: one is covered; the other is uncovered. Students will discuss their observations to try and describe what is happening to the water. Remember that Project-based learning allows for exploration and questioning from the start. Next, the teacher will review the experiment with the large group by encouraging and modeling inquiries, going through the process again, and introducing key vocabulary words, including everything labeled. Students will repeat sentence frames using key vocabulary words. Students will regroup and do the experiment a second time, discussing their observations by using key vocabulary words and sentence frames. Finally, students illustrate their experiment collaborating with their group. Students will practice presenting their experience using key vocabulary to explain this mini-water cycle. The teacher will monitor and coach students through the process to ensure correct vocabulary and sentence frame use.

Assessment: Use the presentation as assessment of students' comprehension. Engage in conversation about their experience to see if they can connect this to other ideas or concepts.

Beyond the science lab: Play the links for the Water Cycle song and Water Cycle animation found in the Teacher Resources section of this unit. Students can present their work to their older buddies. Buddies can work with students to create a recording on Screen Cast. Students can also present their knowledge to their global buddies with whom we communicate using the online visual program called Skype.

Classroom Activity 2

The readings for the second week will come from the big book called "In the Yard" by Dana Meachen and the trade book "David's Drawings" by Cathryn Falwell. Students will compare a tree through the seasons of the year.

Students will experiment with Frost, Snow, and Instant Snow. The objective is "I can explain how to scientifically learn about snow." Students will use observation, investigation, and experimentation skills to draw conclusions, verbalize, illustrate, and write complete sentences conveying their understanding of the experiment. The vocabulary words to connect with this project are: observe, investigate, experiment, senses, freeze, ice, frost, snow, season, winter. Students will practice the skill of Asking Questions with our daily question: "What is the weather today?" They will use describing words for details and discussing deeper questions to help them with illustrations and writing activities in response to our daily question. Students will maintain a class and individual weather graphs to stay connected to real life data and information about daily weather. This also incorporates techniques ensuring the integrity of visual representations of data outlined in Edward Tufte's "Visual Explanations." ¹⁸

During our computer time with buddies, students will use technology to learn about and discuss weather in different parts of the world. We'll communicate online, using Skype, with children in another country and learn how they are affected by their local weather.

Making Snow!

Objective: "I can explain how to scientifically learn about snow." Students will investigate and experiment with frost, snow, and synthetic snow to observe and compare the three using their senses.

Materials:

Frost- One metal can and stirrer per group, one paper towel under each can, ice, water, rock salt.

Snow- One bowl for each group, ice, blender.

Synthetic Snow- Instant Snow Powder, water.

Procedure:

Frost- In the science lab (or classroom), students are divided into groups. Everything must have an intentional and easy-to-see label. Each group will have one metal can on a paper towel to stir water and rock salt. Students observe water vapor condensing and freezing on side of can. Students use their observation skills and senses to investigate this frost to better understand it. The teacher will encourage inquiry while stepping through the process explaining the investigation and experimentation process, using vocabulary words and sentence frames for students to repeat and practice. (For science information to explain, see the "Making Frost" link in Teacher Resources.) Students collaborate with their group to practice describing and explaining the process.

Snow- Student groups are given a bowl of snow. Students use observation skills and senses to investigate snow to compare and contrast with frost.

Synthetic Snow- Students make fake snow right in their hands. They use observation skills and senses to compare and contrast with snow and frost.

(Use the link Making Snow and Instant Snow Powder in Teacher Resources for more information.)

Assessment: Students illustrate their experience and explain the process using new vocabulary. The sequence and comparisons of experiment can be labeled and retold on large newsprint paper folded in thirds with writing lines at the bottom. Students will also present their work and knowledge to an audience.

Beyond: Use magnifying glasses to observe ice crystals of frost. I would also use the Friedlaender observation method ¹⁹ in an exercise with professional artwork depicting winter snow scenes to evoke students' deeper understanding of frost and snow. This observation method allows students to state basic observations, describing only what they see before the next steps of describing interpretations and then learning the artists' intention.

Classroom Activity 3

The readings for this week come from the books "The Snowy Day" by Ezra Jack Keats and "Bear Snores On" by

Karma Wilson and Jane Chapman. The hands-on activity this week is a culminating project to showcase the students' depth of knowledge at the end of the unit.

Students will create a day weather report and a week forecast report using labels, illustrations, reliable data, communication with others in different areas of the world, and technology. The objective is "I can explain how the weather affects us using new weather words and images." Students will with help create and present a weather report as meteorologists, including the type of weather, recommendations for clothing to wear, food to eat, and activities in which to participate. They will also create a forecast for the week. Finally, they will compare local weather to that in another part of the world. The vocabulary words to connect to this project are: weather, meteorology, sun, warm, cool, rain, wind, cloud, fog, frost, snow, storm, season, autumn, fall, winter, spring, summer, shelter, and clothing.

We will use more imagery techniques as students visualize and practice make-believe with experiencing the weather. Students will use their senses to help their observations, descriptions, and illustrations for their verbal and written stories. With buddies, students will use technology to create and discuss a word picture that displays what Scott McCloud describes as a "montage in which words are treated as integral parts of the picture." ²⁰ The "Wordle" will be posted in our classroom for future reference.

Imagine the Weather!

Objective: "I can use my senses and make weather pictures in my mind."

Materials: Paper, crayons, pencils.

Procedure: Review weather vocabulary and sentence frames, engaging students with timed partner talk. Use structured sentence frames such as, "I like ___ weather because I can play ___" or open-ended frames such as "I like ___ weather because ___." The teacher leads the whole group in creating an imaginary scene that the students can relate to, for instance, either outside at their home or at school on the playground. The teacher will focus the scene on weather details, embellishing with a variety of things students can sense. Teachers should explicitly describe the scene in your mind to model the process, using weather vocabulary and incorporating what information you take in through your senses. Students share out and express their images and experiences using weather words. Be sure to practice this activity to continue building imagery, connecting vocabulary, and increasing a deeper comprehension of weather content.

Assessment: Students will illustrate their scene, embellishing with details to express their experience. They will write their own story using weather vocabulary. Students will present to class or buddies, and work will be published and displayed.

Beyond: Students can work with buddies on computers to retell their story by creating it visually with a drawing program and capturing images. Student work will be published and displayed.

What is the Weather?

Objective: "I can tell you about the weather and how it affects us using new weather words and images."

Materials: Paper, crayons, pencils, basic worksheet page blank top-half with lines and on bottom-half, space for presentation of weather report and map, US or world map, labels for days of the week and space to hang/post illustrations for week's forecast display. Please check link for "Kindergarten Weather Reports" in Teacher Resources for a very similar activity that I just found and am adopting.

Procedure: By now, students have already had lessons using weather vocabulary, sentence frames, illustrations, discussions, inquiries, and problem-solving activities. Now they can illustrate and fill out a weather report worksheet for one day's weather with recommended clothing, food, activities. The teacher will have students present their work to their table group, taking turns with time allowed for any questions/answers and praise. The next part of the project is for students to illustrate and label weather for each day of the week to present their weather report and forecast. Students will report the weather for the day, including their recommendations for food, clothing, and activities in response to the day's weather. They will also select places in the US and globally on our map to illustrate and label the weather in that part of the country and the world. Next, they will share their illustrated forecast for the week and any related information they choose to share. Finally, students will point out weather for selected city/state/country (can be more than one) to tell us the weather in that part of the world according to a reliable source. The choices will be provided by the teacher, based on real people that our class can contact via phone, email, FaceTime, or Skype.

Beyond: Students can present their weather report to global buddies adding more information to personalize it with more local information to share with these global friends. Students can present their weather report to the person(s) in the area(s) they chose to report about.

Using relevant projects and meaningful vocabulary strategies, students will build knowledge and comprehension to explain the Big Idea and Essential Questions in this weather unit.

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Appendix A

Implementing District Standards

This unit addresses the California State Standards for English Language Arts and Math, Physical and Earth Sciences, Next Generation Science Standards, California Department of Education English Language

Development Standards, and Common Core Standards. The following briefly explains the science standards that are most specific to this unit and how they are implemented.

The California State Standards for Physical Sciences 1.c are addressed in this unit. They state that, "Students know water left in an open container evaporates (goes into the air) but water in a closed container does not." Students will experiment with this in the precipitation project. Earth Sciences 3.b. is addressed. It states that, "Students know changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants." This standard is what students will address in their culminating project of presenting a weather report, including the type of weather and recommendations for clothing to wear, food to eat, and activities in which to participate. They will also compare local weather to that in another part of the world.

The Next Generation Science Standards: K-ESS2-1 and K-ESS3-2 are addressed in this unit. K-ESS2-1 states that, "Students use and share observations of local weather conditions to describe patterns over time." They will do this by maintaining and discussing their weather graphs throughout the span of the unit. K-ESS3-2 states that students "ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather." Students will address this in their culminating project of presenting a weather report.

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