DOWNLOAD PDF WHATS THE WEATHER? (INVESTIGATE SCIENCE)

Chapter 1 : 6th Grade - Weather and Climate - Science

Melissa Stewart earned a bachelor's degree in biology from Union College and a master's degree in science and environmental journalism from New York University.

Using a trick I had learned as a child, we started measuring the time between seeing the lightning and hearing the thunder. Even if you cannot remember much of what your high school biology teacher taught you, you can help your child understand how science affects their world. For science lesson ideas, keep these easy tips in mind: Begin a weather journal. Have your child record the weather each day sunny, rainy, snowy, windy, etc. Rajna notes that differences in outerwear choices are one of the most simple ways to show change. Children are naturally curious about their surroundings. A walk through the leaves on a fall day opens the discussion of why they change color. How about that next snowstormâ€”is it fluffy and perfect for sledding, or dense and good for making a snowman? Otis Kriegel, a year veteran elementary school teacher and a former educator at New York University, explains how to draw science observations out of a simple family exercise. He then suggests talking about the observations. What was the weather like that day? Use weather predictions to demonstrate how science helps their community. Knowing that weather can be predicted and planned for can help children understand their environment and weather. I showed how weather can somewhat be predicted and how we prepare for different dramatic weather conditions. If your child has a fascination with the weather, allow them to explore their interest through age-appropriate books. Share different types of science with your child. Talk about physics and light and taking care of our planet. Help your child become a lifelong learner. Let the changing seasons and weather events serve as a natural reminder that science lessons are occurring all around you. Pick one of the experiments on Sid the Science Kid or use one of the ideas above and help your little one start seeing the many ways science affects their world.

Chapter 2 : Science - Kindergarten Core

Weather activities can be incorporated in science explorations as well as seasonal and other study themes. Use these ideas to lead your kids to explore all kinds of weather in all kinds of ways. Use these ideas to lead your kids to explore all kinds of weather in all kinds of ways.

Parhelion sundog in Savoie The ability to predict rains and floods based on annual cycles was evidently used by humans at least from the time of agricultural settlement if not earlier. Early approaches to predicting weather were based on astrology and were practiced by priests. Cuneiform inscriptions on Babylonian tablets included associations between thunder and rain. In BC, Aristotle wrote Meteorology. At other times, it travels in crooked lines, and is called forked lightning. The Greek scientist Theophrastus compiled a book on weather forecasting, called the Book of Signs. The work of Theophrastus remained a dominant influence in the study of weather and in weather forecasting for nearly 2, years. He describes the meteorological character of the sky, the planets and constellations , the sun and moon , the lunar phases indicating seasons and rain, the anwa heavenly bodies of rain , and atmospheric phenomena such as winds, thunder, lightning, snow, floods, valleys, rivers, lakes. Admiral FitzRoy tried to separate scientific approaches from prophetic ones. Rainbow and Twilight Ptolemy wrote on the atmospheric refraction of light in the context of astronomical observations. Albert the Great was the first to propose that each drop of falling rain had the form of a small sphere, and that this form meant that the rainbow was produced by light interacting with each raindrop. He stated that a rainbow summit can not appear higher than 42 degrees above the horizon. Theoderic went further and also explained the secondary rainbow. Instruments and classification scales[edit] See also: In , Leone Battista Alberti developed a swinging-plate anemometer , and was known as the first anemometer. In , Johannes Kepler wrote the first scientific treatise on snow crystals: In , Gabriel Fahrenheit created a reliable scale for measuring temperature with a mercury-type thermometer. The April launch of the first successful weather satellite , TIROS-1 , marked the beginning of the age where weather information became available globally. Atmospheric composition research[edit] In , Blaise Pascal rediscovered that atmospheric pressure decreases with height, and deduced that there is a vacuum above the atmosphere. In , John Dalton defended caloric theory in A New System of Chemistry and described how it combines with matter, especially gases; he proposed that the heat capacity of gases varies inversely with atomic weight. In , Sadi Carnot analyzed the efficiency of steam engines using caloric theory; he developed the notion of a reversible process and, in postulating that no such thing exists in nature, laid the foundation for the second law of thermodynamics. Coriolis effect and Prevailing winds In , Christopher Columbus experienced a tropical cyclone, which led to the first written European account of a hurricane. Gaspard-Gustave Coriolis published a paper in on the energy yield of machines with rotating parts, such as waterwheels. By , this deflecting force was named the Coriolis effect. Observation networks and weather forecasting[edit] Cloud classification by altitude of occurrence This "Hyetographic or Rain Map of the World " was first published by Alexander Keith Johnston. History of surface weather analysis In the late 16th century and first half of the 17th century a range of meteorological instruments was invented â€" the thermometer , barometer , hydrometer , as well as wind and rain gauges. In the s natural philosophers started using these instruments to systematically record weather observations. Scientific academies established weather diaries and organised observational networks. The collected data were sent to Florence at regular time intervals. Thus early meteorologists attempted to correlate weather patterns with epidemic outbreaks, and the climate with public health. But there were also attempts to establish a theoretical understanding of weather phenomena. Edmond Halley and George Hadley tried to explain trade winds. They reasoned that the rising mass of heated equator air is replaced by an inflow of cooler air from high latitudes. A flow of warm air at high altitude from equator to poles in turn established an early picture of circulation. Frustration with the lack of discipline among weather observers, and the poor quality of the instruments, led the early modern nation states to organise large observation networks. Thus by the end of the 18th century meteorologists had access to large quantities of reliable weather date. To make frequent weather forecasts based on these data required a reliable network of observations, but it was not until that the

Smithsonian Institution began to establish an observation network across the United States under the leadership of Joseph Henry. The following year a system was introduced of hoisting storm warning cones at principal ports when a gale was expected. Over the next 50 years many countries established national meteorological services. The India Meteorological Department was established to follow tropical cyclone and monsoon. The Australian Bureau of Meteorology was established by a Meteorology Act to unify existing state meteorological services. He described how small terms in the prognostic fluid dynamics equations that govern atmospheric flow could be neglected, and a numerical calculation scheme that could be devised to allow predictions. Richardson envisioned a large auditorium of thousands of people performing the calculations. However, the sheer number of calculations required was too large to complete without electronic computers, and the size of the grid and time steps used in the calculations led to unrealistic results. Though numerical analysis later found that this was due to numerical instability. Starting in the s, numerical forecasts with computers became feasible. These climate models are used to investigate long-term climate shifts, such as what effects might be caused by human emission of greenhouse gases. Weather forecasting Meteorologists are scientists who study meteorology. In the United States, meteorologists held about 9, jobs in Some radio and television weather forecasters are professional meteorologists, while others are reporters weather specialist, weatherman, etc.

Chapter 3 : Exploring Weather | Activities | The Cat in the Hat | PBS PARENTS

Atmospheric scientists study the weather and climate, and examine how those conditions affect human activity and the earth in general. Most atmospheric scientists work indoors in weather stations, offices, or laboratories. Occasionally, they do fieldwork, which means working outdoors to examine the.

What causes different kinds of weather? How does weather differ from climate? Why is understanding how weather forms important to our lives? Overarching Enduring Understandings Weather is the result of short-term variations in temperature, humidity, and air pressure 5. The atmosphere has a different physical and chemical composition at different elevations. How do patterns in local weather create climate? Why is weather forecasting important locally and globally? Atmospheric conditions, land, and oceans interact to create varying weather conditions. Local weather conditions create the climate of an area when recorded over time. Weather forecasts help people in many ways. Unit Rationale Weather affects all of our lives in ways both large and small each day. Knowledge of how weather forms, understanding weather forecasts, and an awareness of how to prepare for severe weather are essential to life in the 21st century. In our world today, weather has far reaching interpersonal, environmental, and economic effects. This unit helps students to understand the role weather plays in their lives as well as the lives of others and to understand the role technology plays in forecasting weather today. Unit Overview In this unit students will learn how weather forms as a result of the complex interactions between temperature, humidity, and air pressure. Through the study and creation of forecasts they will understand how other conditions both in our country and the world at large play a role in weather. Additionally, students will learn how tools and technology are used to create forecasts and how these forecasts can be used both locally and globally. Working both independently and with their peers, students will practice real world skills in predicting and interpreting the weather in order to understand its role in their lives and the lives of others. In addition they will identify and use the tools and technology used to create weather forecasts using hands-on and virtual activities. Students will create a weather map of major US interior and coastal cities using appropriate symbols and write a forecast based on the map. Students will research other cultures throughout the world and learn how weather influences the land and people. Finally, students will write a narrative in which they reflect on and describe a time when weather affected their own lives personally. In addition they will understand how weather travels and varies across our own country. This information can be used to keep people safe as well as plan for activities. Students will gain a perspective of how weather affects people both personally and economically throughout the world. By studying how daily weather conditions form a climate over time, students will understand how weather impacts different cultures in the world. Communication and Collaboration Students will understand the immediate significance of communicating weather data orally using media such as television, radio, and the internet. Using this data, students will appreciate the importance of accurate and effective forecasting on the lives of local and global citizens. Students will recognize the value of written communication in forecasting weather. They will appreciate how both words and visuals symbols can be used to create forecasts which enrich and protect the lives of all people. Informational, Media, and Technology Skills Students will learn how computer models can be used to predict severe weather and understand the impact this has on citizens of both the US and the world. They will also research and understand tools that are used to gather information on the various components used in building a weather forecast. The students will now understand how various atmospheric conditions interact to produce weather they have previously observed and recorded. They will add to their knowledge of basic weather instruments by understanding the role of more advanced instruments and technology. A key aspect of the unit is to help students see how weather not only affects them personally, but that weather has an effect on local, national, and international populations. This unit prepares students for a more complex study of global differences in climate and aids in building schema about the concept of a global energy budget. What do these different formats have in common? What information do they give people about weather? Analyze data for patterns. Students use internet to research a country to learn about its culture. Information about weather and its impact on the culture should be included. Students watch videos on United Streaming website

that relate to forecasting and severe weather. Create a videotape or podcast of a weather forecast. Use of Multiple Resources Students will use text book and leveled texts to find information on weather. Leveled texts will be used where available and appropriate. Assignments and assessments will incorporate a variety of multiple intelligences in order to address al learning styles. Attention will be given to Tier 3 vocabulary words required by unit. Gifted Learners Offer higher level texts and articles to these learners. Encourage advanced vocabulary, more sophisticated writing style, and additional research in written assessments. Weather information should appear in the narrative and appropriate key vocabulary terms should be used correctly. Weather Map â€" students will create a weather map showing information of at least 5 countries in the US. The map will include data such as temperature, fronts, and air masses as well as appropriate symbols. Weather Forecast â€" write and perform a weather forecast based on the map you created. A Math - Graph weather data in bar or line graph 4. Students will work together in groups of 4 or 5 to create a mock forecast to share with the class. Each group would present a weather forecast with each group member giving detailed information on weather in one of the 5 cities. These forecasts could be performed live, videotaped, or recorded as podcasts. Weather Station Oral Communication, Collaboration Skills, Civic Awareness After creating weather instruments in labs, groups of students could gather daily data on weather from these tools to make predictions. The predictions would be written in the form of a daily forecast. These forecasts could be shared daily with the school community through morning announcements, classroom web pages, or a weather bulletin board located in a central location. See this website for information on easy materials to create a weather station http: What Interactions Determine Weather? How is technology used to collect weather data? How are weather forecasts made? What happens during severe weather?

Chapter 4 : Weather Activities for Preschoolers

Science K Unit 1 WEATHER o Students relate the numbers on the scale to hotter or colder temperatures. o Students observe and record cloud cover, precipitation, and wind on the Weather Calendar.

Image courtesy of bowmanlibrary, Flickr. Making predictions is a strategy in which readers use information from a text including titles, headings, pictures, and diagrams and their own personal experiences to anticipate what they are about to read or what comes next. A reader involved in making predictions is focused on the text at hand, constantly thinking ahead and also refining, revising, and verifying his or her predictions. This strategy also helps students make connections between their prior knowledge and the text. Students may initially be more comfortable making predictions about fiction than nonfiction or informational text. This may be due to the fact that fiction is more commonly used in early reading instruction. Students also tend to be more comfortable with the structure of narrative text than they are with the features and structures used in informational text. However, the strategy is important for all types of text. Teachers should make sure to include time for instruction, modeling, and practice as students read informational text. They can also help students successfully make predictions about informational text by ensuring that students have sufficient background knowledge before beginning to read the text. Predicting is also a process skill used in science. In this context, a prediction is made about the outcome of a future event based upon a pattern of evidence. Teachers can help students develop proficiency with this skill by making connections between predicting while reading and predicting in science. Students will not necessarily make these connections independently, so teacher talk and questioning are important. Sometimes, teachers will use the terms prediction and hypothesis interchangeably in science. While the terms are similar, there are subtle differences between the two. A hypothesis is a specific type of prediction made when designing and conducting an investigation in which a variable is changed. The distinction between a prediction and a hypothesis is not something that elementary students need to understand and explain. However, teachers can be cognizant of how they use these words during science instruction â€” using prediction for statements of what might happen based on prior knowledge or evidence and hypothesis only when an investigation calls for a variable to be changed. For More Information Predicting This page provides an overview of the reading strategy, an explanation of how predicting supports reading comprehension, and several activities that support students in predicting.

Chapter 5 : Weather 1: Weather Patterns - Science NetLinks

Note: Some of these items are dangerous for K-2 students. Use caution when having students use the materials, or have an adult make these items for the students. This lesson is the first in a two-part series on the weather. The study of the weather in these early years is important because it can.

You may want to read Weather on the National Science Education Standards site for an example of how you could use a weather station in your school. Motivation First, get students to just talk about weather generally. Ask questions such as: What was it like yesterday? How can you find out what the weather will be like ahead of time? Do you know what it will be like tomorrow? Does the weather ever affect what you can do e. Can you find clues around the classroom that indicate what the weather is like? Examples could include umbrellas, raincoats, shorts, t-shirts, snow boots, etc. Would you have found the same types of items in the room yesterday? If not, why not? Then talk to them about the types of clothing shown there. What types of clothes do you see pictured for when the weather is hot? Answers should include a hat, t-shirt, shorts, sandals, sunglasses, and swimsuit. Why would these be good types of clothes to wear when the weather is hot? These are good clothes to wear when the weather is hot because they help to keep you cool and protect you from the sun. Can you think of any other types of clothing that could be added to the ones you see? Accept all logical answers. Then have students go to Rainy Weather and talk to them about the clothing shown there. Ask them the same types of questions as listed above. Finally, have students go to Cold Weather and talk to them about the clothing shown there. After looking at and discussing all of the pictures, consider reading a weather-related book to your students like: Tell students that they will observe and record the weather for a one-week period. At the end of each school day, students should use the symbols available on the Weather Watch Symbols page to indicate what the weather was like for that day by cutting out the symbols and pasting them onto the chart. At the end of each day, ask students questions like: What did you observe about the weather today? Was the sun shining? Were there clouds in the sky? At the end of a week, students should use the information they recorded on their chart to fill in the My Weather Graph. By filling in the graph, students will create a bar chart that will show the weather pattern for the week. Ask students the guiding questions included in Step 6 in the online activity and those suggested here: What kind of weather did you see the most? What other kinds of weather could you have seen? How would you represent those on a graph? How many days did it rain or snow, etc. How many days had the same kind of weather? How many days had more than one kind of weather? After students have generally observed, graphed, and analyzed weather, ask them how they could make even better observations and how they think weather people on TV make observations. This conversation should eventually lead to the use of tools e. Perhaps students used tools in the above observations too; if so, you could talk about those here. If you feel that your students would benefit from actually doing activities that involve the use of weather tools, then you can have them do some of the activities found on the Make Your Own Weather Station site. Students should follow the directions to make the weatherproof box, rain gauge, and weather vane. You may want to print the instructions to give to the groups as well. After constructing the boxes, you will need to place them outside in an appropriate location. What would your graph have looked like last week? What do you think your graph would look like in a different month? In a different season? Looking at your weather chart, was the weather the same from day to day? For example, the time the sun rises and sets; the phases of the moon, etc. Extensions You can extend the ideas in this lesson by taking your students through the Science NetLinks lesson series on the sky, which encourages students to observe the daytime and nighttime sky regularly to identify sequences of changes and to look for patterns in these changes. The first lesson in the series is: Objects in the Sky. The activities in this lesson focus on studying a graph that reports the number of students who wore sweaters to school each day for one week. The information is shown in a block graph. The students are asked to discuss and describe the information and then predict what happened on the basis of the given information. They are encouraged to write an explanation to defend their predictions. Web Weather for Kids has more specific information about weather phenomena like clouds, hurricanes, thunderstorms, tornadoes, and winter storms. It includes stories, games, and activities for students.

They can even try their hand at forecasting the weather.

Chapter 6 : Weather forecasting - Wikipedia

Forensic meteorologists investigate claims for insurance companies on past weather or research past weather conditions pertaining to court cases in a court of law while consulting meteorologists are hired on by retailers, film crews, large corporations, and other non-weather companies to provide weather guidance on a variety of projects.

Ancient forecasting[edit] For millennia people have tried to forecast the weather. For example, it might be observed that if the sunset was particularly red, the following day often brought fair weather. This experience accumulated over the generations to produce weather lore. However, not all[which? It was not until the invention of the electric telegraph in that the modern age of weather forecasting began. He also promoted the development of reliable tide tables around British shores, and with his friend William Whewell , expanded weather record-keeping at British Coast guard stations. Robert FitzRoy was appointed in as chief of a new department within the Board of Trade to deal with the collection of weather data at sea as a service to mariners. This was the forerunner of the modern Meteorological Office. A storm in that caused the loss of the Royal Charter inspired FitzRoy to develop charts to allow predictions to be made, which he called "forecasting the weather", thus coining the term "weather forecast". His warning service for shipping was initiated in February , with the use of telegraph communications. The first daily weather forecasts were published in The Times in As the electric telegraph network expanded, allowing for the more rapid dissemination of warnings, a national observational network was developed, which could then be used to provide synoptic analyses. Instruments to continuously record variations in meteorological parameters using photography were supplied to the observing stations from Kew Observatory â€" these cameras had been invented by Francis Ronalds in and his barograph had earlier been used by FitzRoy. History of numerical weather prediction It was not until the 20th century that advances in the understanding of atmospheric physics led to the foundation of modern numerical weather prediction. He described therein how small terms in the prognostic fluid dynamics equations governing atmospheric flow could be neglected, and a finite differencing scheme in time and space could be devised, to allow numerical prediction solutions to be found. Richardson envisioned a large auditorium of thousands of people performing the calculations and passing them to others. However, the sheer number of calculations required was too large to be completed without the use of computers, and the size of the grid and time steps led to unrealistic results in deepening systems. It was later found, through numerical analysis, that this was due to numerical instability. Broadcasts[edit] The first ever daily weather forecasts were published in The Times on August 1, , and the first weather maps were produced later in the same year. These included gale and storm warnings for areas around Great Britain. Harold Noyes in This was brought into practice in after World War II. George Cowling gave the first weather forecast while being televised in front of the map in TWC is now a hour cable network. Some weather channels have started broadcasting on live broadcasting programs such as YouTube and Periscope to reach more viewers. How models create forecasts[edit] An example of mbar geopotential height and absolute vorticity prediction from a numerical weather prediction model Main article: Numerical weather prediction The basic idea of numerical weather prediction is to sample the state of the fluid at a given time and use the equations of fluid dynamics and thermodynamics to estimate the state of the fluid at some time in the future. The main inputs from country-based weather services are surface observations from automated weather stations at ground level over land and from weather buoys at sea. The World Meteorological Organization acts to standardize the instrumentation, observing practices and timing of these observations worldwide. Research flights using reconnaissance aircraft fly in and around weather systems of interest such as tropical cyclones. The data are then used in the model as the starting point for a forecast. These equations are initialized from the analysis data and rates of change are determined. The rates of change predict the state of the atmosphere a short time into the future. The equations are then applied to this new atmospheric state to find new rates of change, and these new rates of change predict the atmosphere at a yet further time into the future. This time stepping procedure is continually repeated until the solution reaches the desired forecast time. The length of the time step chosen within the model is related to the distance between the points on the computational grid, and is

chosen to maintain numerical stability. This can be in the form of statistical techniques to remove known biases in the model, or of adjustment to take into account consensus among other numerical weather forecasts. This guidance is presented in coded numerical form, and can be obtained for nearly all National Weather Service reporting stations in the United States. As proposed by Edward Lorenz in , long range forecasts, those made at a range of two weeks or more, are impossible to definitively predict the state of the atmosphere, owing to the chaotic nature of the fluid dynamics equations involved. In numerical models, extremely small errors in initial values double roughly every five days for variables such as temperature and wind velocity. Within any modern model is a set of equations, known as the primitive equations, used to predict the future state of the atmosphere. Additional transport equations for pollutants and other aerosols are included in some primitive-equation mesoscale models as well. Different models use different solution methods: This can be a valid way of forecasting the weather when it is in a steady state, such as during the summer season in the tropics. This method of forecasting strongly depends upon the presence of a stagnant weather pattern. Therefore, when in a fluctuating weather pattern, this method of forecasting becomes inaccurate. It can be useful in both short range forecasts and long range forecasts. If the pressure drop is rapid, a low pressure system is approaching, and there is a greater chance of rain. Rapid pressure rises are associated with improving weather conditions, such as clearing skies. Along with pressure tendency, the condition of the sky is one of the more important parameters used to forecast weather in mountainous areas. Thickening of cloud cover or the invasion of a higher cloud deck is indicative of rain in the near future. High thin cirrostratus clouds can create halos around the sun or moon , which indicates an approach of a warm front and its associated rain. The approach of a line of thunderstorms could indicate the approach of a cold front. Cloud-free skies are indicative of fair weather for the near future. The use of sky cover in weather prediction has led to various weather lore over the centuries. Nowcasting meteorology The forecasting of the weather within the next six hours is often referred to as nowcasting. A human given the latest radar, satellite and observational data will be able to make a better analysis of the small scale features present and so will be able to make a more accurate forecast for the following few hours. Use of forecast models[edit] An example of mbar geopotential height prediction from a numerical weather prediction model In the past, the human forecaster was responsible for generating the entire weather forecast based upon available observations. Humans can use knowledge of local effects that may be too small in size to be resolved by the model to add information to the forecast. While increasing accuracy of forecast models implies that humans may no longer be needed in the forecast process at some point in the future, there is currently still a need for human intervention. What makes it a difficult technique to use is that there is rarely a perfect analog for an event in the future. It remains a useful method of observing rainfall over data voids such as oceans, [74] as well as the forecasting of precipitation amounts and distribution in the future. A similar technique is used in medium range forecasting, which is known as teleconnections, when systems in other locations are used to help pin down the location of another system within the surrounding regime. Temperatures are given in Fahrenheit. Most end users of forecasts are members of the general public. Thunderstorms can create strong winds and dangerous lightning strikes that can lead to deaths, power outages, [77] and widespread hail damage. Heavy snow or rain can bring transportation and commerce to a stand-still, [78] as well as cause flooding in low-lying areas. Knowledge of what the end user needs from a weather forecast must be taken into account to present the information in a useful and understandable way. In addition, some cities had weather beacons. Increasingly, the internet is being used due to the vast amount of specific information that can be found. Severe weather alerts and advisories[edit] A major part of modern weather forecasting is the severe weather alerts and advisories that the national weather services issue in the case that severe or hazardous weather is expected. This is done to protect life and property. Other forms of these advisories include winter weather, high wind, flood , tropical cyclone , and fog. Specialist forecasting[edit] There are a number of sectors with their own specific needs for weather forecasts and specialist services are provided to these users. Terminal Aerodrome Forecast Because the aviation industry is especially sensitive to the weather, accurate weather forecasting is essential. Fog or exceptionally low ceilings can prevent many aircraft from landing and taking off. This reduces the distance required for takeoff, and eliminates potential crosswinds. Marine weather

forecasting Commercial and recreational use of waterways can be limited significantly by wind direction and speed, wave periodicity and heights, tides, and precipitation. These factors can each influence the safety of marine transit. Consequently, a variety of codes have been established to efficiently transmit detailed marine weather forecasts to vessel pilots via radio, for example the MAFOR marine forecast. Agriculture[edit] Farmers rely on weather forecasts to decide what work to do on any particular day. For example, drying hay is only feasible in dry weather. Prolonged periods of dryness can ruin cotton , wheat , [96] and corn crops. While corn crops can be ruined by drought, their dried remains can be used as a cattle feed substitute in the form of silage. For example, peach trees in full bloom can have their potential peach crop decimated by a spring freeze. Different indices, like the Forest fire weather index and the Haines Index , have been developed to predict the areas more at risk to experience fire from natural or human causes. Conditions for the development of harmful insects can be predicted by forecasting the evolution of weather, too. Utility companies[edit] An air handling unit is used for the heating and cooling of air in a central location click on image for legend. Degree day Electricity and gas companies rely on weather forecasts to anticipate demand, which can be strongly affected by the weather. They use the quantity termed the degree day to determine how strong of a use there will be for heating heating degree day or cooling cooling degree day. Cooler temperatures force heating degree days one per degree Fahrenheit , while warmer temperatures force cooling degree days. Weather forecasts can be used to invest in the commodity market, such as futures in oranges, corn, soybeans, and oil. A group based at Camp Bastion provides forecasts for the British armed forces in Afghanistan. Military weather forecasters provide pre-flight and in-flight weather briefs to pilots and provide real time resource protection services for military installations. Naval forecasters cover the waters and ship weather forecasts. The United States Navy provides a special service to both themselves and the rest of the federal government by issuing forecasts for tropical cyclones across the Pacific and Indian Oceans through their Joint Typhoon Warning Center. Air Force forecasters cover air operations in both wartime and peacetime operations and provide Army support; [] United States Coast Guard marine science technicians provide ship forecasts for ice breakers and other various operations within their realm; [] and Marine forecasters provide support for ground- and air-based United States Marine Corps operations.

Chapter 7 : Science | Define Science at theinnatdunvilla.com

Weather Activities for theinnatdunvilla.com science experiments to help kids learn about the weather. This page has great ideas for preschool weather science.

Getting Ready When you are getting ready to go outside, encourage your child to think about the weather by asking "What do you think the weather is like out today? You can also focus her attention on specific aspects of weather: There are many different types of clouds, including puffy cumulus clouds, feathery cirrus clouds, and long, low stratus clouds. Invite your child to lie down outside and look for familiar shapes in the clouds. Encourage her to describe the shapes. Invite her to notice whether or not the clouds are moving and how they are moving. Ask her to make predictions like "Do you think the clouds will cover the sun, or do you think the clouds will move and the sun will come out of hiding? If you are out and about, encourage her to observe and describe the rain. Are the drops really big or small? If you live in an area where it snows, encourage your child to make a snowman, a snowwoman, or a snow creature just as Sally and Nick do in The Cat in the Hat Knows a Lot About That! Ask questions like "How well does the snow stick together? Encourage your child to listen to the wind and look for evidence of its effects on trees and other things like paper blowing in the street. Invite her to make a small kite by using construction paper, ribbon, and string. Can she notice the effects of wind when she tosses the kite up in the air? Can she tell which direction the wind is blowing? How does the wind feel on her body when it is blowing gently compared to when it is blowing hard? What does it feel like when there is no wind at all? Depending on where you live, your child may experience variable temperatures within relatively short periods; for example, it may be very warm during the day but cold at night. Even if you live in an area with consistent temperatures year-round, you can take opportunities to notice things melting as a result of changes in temperature. For example, as your child is eating ice cream on a hot summer day, you can ask "Why do you think your ice cream is melting? You can also help her begin to see patterns in weather over time by counting the number of sunny, rainy, or windy days. Make connections for her between the weather chart and typical weather in your area at that time of year by saying, for example, "We had four days of rain this week. Spring is a very rainy season. If you live in a temperate area with warm summers and freezing cold winters, share stories about family activities during different seasons. For example, maybe some family members fish at a local pond during the summer and other family members go ice skating during the winter.

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Chapter 8 : Meteorology - Wikipedia

Help students of all ages learn the science behind weather forecasts with the lessons, printables, and references below. Study the effects of climate change with global warming handouts.

Course Introduction Introduction Science is a way of knowing, a process for gaining knowledge and understanding of the natural world. The Science Core Curriculum places emphasis on understanding and using skills. Students should be active learners. It is not enough for students to read about science; they must do science. They should observe, inquire, question, formulate and test hypotheses, analyze data, report, and evaluate findings. The students, as scientists, should have handsâ€”on, active experiences throughout the instruction of the science curriculum. It was developed, critiqued, piloted, and revised by a community of Utah science teachers, university science educators, and State Office of Education specialists. Core Standards are supported by material research on science literacy and essential learning standards. The core concepts included in the Standards are those that are central to a discipline of science i. The Guidance section contains suggested strategies that are connected to language arts and mathematical topics. These connections assist teachers with activities of reading, writing, speaking, presenting, calculating, graphing, and measuring in their science teaching. Science concepts can be taught in tandem with literacy skills through reading, speaking, and writing while students are involved in the scientific process. Mathematical understanding can also be enhanced by highlighting the application of mathematical concepts in scientific settings, such as using measurement concepts to weigh rocks or measure plants to investigate change over time. Describes how the core is organized to assist teachers in understanding and teaching scientific concepts through process skills, utilizing big ideas, and making application to technology and society. Is the intended learning outcomes standard. It contains three objectives: Standards 2, 3, and 4: Reflects the disciplines of science. These standards are consistent across all three grades. Each standard is further explicated by objectives and indicators. Shows the learning progressions inherent in the core. The charts are organized by standard, each containing the objectives and indicators for each grade side by side. Includes a chart of supplemental materials for each objective within the core. The supplemental materials are color coded by standard: A guide for reading and using the materials with an explanation of each section of the sheet appears in Appendix B. The Big Ideas for each standard organized by grade level. How to read the supplemental materials charts. Note, explanations, and research base. References used in the development of the core. Students will be able to apply scientific processes, communicate scientific ideas effectively, and understand the nature of science. Objective 1 Generating Evidence: Using the processes of scientific investigation i. Observe using senses, create a hypothesis, and focus a question that can lead to an investigation. Consider reasons that support ideas, identify ways to gather information that could test ideas, design fair tests, share designs with peers for input and refinement. Observe, manipulate, measure, describe. Deciding what data to collect and how to organize, record, and manipulate the data. Analyzing data, making conclusions connected to the data or the evidence gathered, identifying limitations or conclusions, identifying future questions to investigate. Objective 2 Communicating Science: Communicating effectively using science language and reasoning Developing social interaction skills with peers. Sharing ideas with peers. Connecting ideas with reasons evidence. Objective 3 Knowing in Science: Understanding the nature of science Ideas are supported by reasons. There are limits to ideas in science i. Differences in conclusions are best settled through additional observations and investigations. Communication of ideas in science is important for helping to check the reasons for ideas. Standard 2 Earth and Space Science. Students will gain an understanding of Earth and Space Science through the study of earth materials, celestial movement, and weather.

Chapter 9 : Using Weather to Teach Science Lessons . Science Tips . Education | PBS Parents

Discoveries about Mexican Earthquake Rattle Geologists Oct 26, , am EDT The location of the magnitude earthquake and what it did there was a surprise, researchers say.