Take-Home Science

Dear Family,

Our class is beginning an inquiry science unit. Inquiry science is all about questions, active explorations, drawing, writing, and recording what you see and do to build an understanding of science. Young children are natural scientists. Scientists question everything. Once scientists answer one question, they move without blinking to the next question.

Take-Home Science is an exciting part of our program because it's one way we can better connect home and school. With everyone working together, we can reinforce the science concepts that your student is exploring in the classroom. Here's how Take-Home Science works.

Your student will bring home an investigation sheet that explains an activity related to the science unit the class is studying. The activity is designed so that everyone in the household—younger and older children alike—can work together to learn about science.

A section of the investigation sheet explains the science words and ideas that will be explored during the activity. These science words and ideas are not new to your student because the activity follows a lesson in which those same concepts were explored.

The activities are simple and can be completed within 20 minutes using items normally found in the home. A section of the investigation sheet is for your student to complete and bring back to school. In class, students will have the opportunity to share their experiences and results with one another.

The activities are intended to be quick, informal, and fun. Enjoy!

GO EXPLORING!

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Take-Home Science

Observing Air Pressure

Vocabulary:

Air pressure: The force applied to a surface by the weight of air.
Barometer: A tool that measures air pressure changes.

Equipment:

- 1 Cup, 10 or 12 oz (large enough that the bottle fits snugly in the top but does not touch the bottom)
- 1 Plastic bottle, 20 oz
- Marker
- Water

A. Build a Barometer

Step 1: Fill the cup two-thirds of the way with water.

Step 2: Make sure your plastic bottle is clean and dry. If the plastic bottle has a cap, remove it and dispose of it.

Step 3: Do this step over a sink! Turn the plastic bottle upside down and place it in the cup of water. Push the bottle gently into the cup so that it fits snugly in the cup. The mouth of the bottle should be below the waterline but should not be touching the bottom of the cup.

Step 4: Tilt the cup slightly to allow some water to enter the bottle. Continue to let water into the bottle until you don't see any more air bubbles.

Step 5: Set the cup upright. The mouth of the bottle should be below the level of the water in the cup.

Step 6: Place the barometer in an area that won't be too hot or cold. Keeping the barometer away from windows will help ensure moderate temperatures. Use a marker to draw a line on the cup where you observe the water level. Write the date next to this line.

What's Happening Inside My Barometer?

Air pressure is usually higher when the weather is clear; when air pressure is lower, it usually means stormy weather is on the way. As weather conditions change, the water level in your barometer should rise and fall, too. Higher air pressure will exert more force on the water and cause the water level to rise. Lower air pressure pushes on the water less, and the water level in the cup will fall. As you gather actual weather details over the next five days, compare those data to the measurements from your barometer.

Take-Home Science

Name _____

Date _____

Observing Air Pressure

B. Record

1. One day after setting up your barometer, fill in the first row of the chart below. Record the date, and then take another reading of your barometer. Be sure to mark the water level and write the date on the cup. Record whether the water level is higher, lower, or the same as your initial reading.

2. Use the Internet, a newspaper, or a local newscast to obtain the actual temperature, precipitation, and air pressure data for the day. Record these in the table.

3. Write a description or draw a diagram of what the weather was like.

4. Repeat Steps 1–3 until you have five days of weather data. Then bring the completed chart back to class, and share your data with your classmates.

Date	Water Level in Cup (higher, lower, or the same as the previous day)	Actual Weather Conditions	Diagram or Describe Your Observations of the Weather

Ciencia para llevar a casa

Querida familia:

Nuestra clase está comenzando una unidad de ciencia inquisitiva. La ciencia inquisitiva se trata de preguntas, exploraciones activas, dibujos, redacciones y grabaciones de lo que ven y hacen para crear un mayor entendimiento de la ciencia. Los niños pequeños son científicos naturales. Los científicos cuestionan todo. Cuando los científicos responden una pregunta, pasan sin titubear a la siguiente.

La ciencia para llevar a casa es una parte emocionante de nuestro programa porque es una forma en que podemos conectar mejor la escuela y nuestro hogar. Al trabajar todos juntos, podemos reforzar los conceptos científicos que el alumno explora en el aula. Así funciona la ciencia para llevar a casa.

El alumno llevará a casa una hoja de investigación que explica una actividad relacionada con la unidad de ciencia que la clase está estudiando. La actividad está diseñada para que todos los miembros de la familia (hijos más pequeños y más grandes por igual) puedan trabajar juntos para aprender sobre ciencia.

Una sección de la hoja de investigación explica la terminología científica y las ideas que se explorarán durante la actividad. Esta terminología científica y las ideas no son nuevas para el estudiante, ya que la actividad sigue una clase en la que se exploraron esos mismos conceptos.

Las actividades son simples y se pueden completar en 20 minutos con artículos que se hallan normalmente en una casa. Una sección de la hoja de investigación está dedicada para que el alumno la complete y la lleve a la escuela. En clase, los alumnos tendrán la oportunidad de compartir sus experiencias y resultados con los compañeros.

Las actividades deben ser rápidas, informales y divertidas. ¡A disfrutar!

¡SALGAN A EXPLORAR!

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Ciencia para llevar a casa

Observemos la presin atmosfrica

Vocabulario:

Presión atmosférica: La fuerza que ejerce el peso del aire sobre una superficie.
Barómetro: Herramienta que mide los cambios en la presión atmosférica.

Materiales:

- 1 taza de 10 o 12 onzas (lo suficientemente grande como para que la botella entre perfectamente, pero que no toque el fondo)
- 1 botella de plástico de 20 onzas
- Marcador
- Agua

A. Construyamos un barómetro

Paso 1: Llena dos tercios de la taza con agua.

Paso 2: Asegúrate de que la botella de plástico esté limpia y seca. Si la botella de plástico tiene tapa, quítasela y tírala a la basura.

Paso 3: ¡Debes hacer lo siguiente sobre el fregadero! Da vuelta la botella con el pico hacia abajo y colócala sobre la taza con agua. Empuja la botella con delicadeza para que encaje perfectamente en la taza. El pico de la botella debe estar por debajo de la línea del agua, pero no debe tocar el fondo de la taza.

Paso 4: Inclina levemente la taza para que entre un poco de agua a la botella. Deja que entre agua en la botella hasta que ya no veas burbujas de aire.

Paso 5: Coloca la taza derecha nuevamente. El pico de la botella debe estar por debajo de la línea del agua de la taza.

Paso 6: Coloca el barómetro en un lugar que no sea ni muy caluroso ni muy frío. Para que la temperatura sea moderada, es mejor colocar el barómetro lejos de las ventanas. Usa un marcador para trazar una línea del nivel del agua en la taza. Escribe la fecha junto a esa línea.

¿Qué pasa dentro de mi barómetro?

Por lo general, la presión atmosférica es más alta cuando el cielo está despejado, y cuando se acerca una tormenta, la presión atmosférica es más baja. Cuando varía el estado del tiempo, el nivel de agua en tu barómetro también debe subir y bajar. Si la presión atmosférica es más alta, ejerce más fuerza sobre el agua y el nivel de agua sube. Cuando la presión atmosférica es más baja, ejerce menos presión sobre el agua y el nivel de agua baja. A medida que recolectes datos reales del estado del tiempo durante los próximos cinco días, compara esos datos con las mediciones de tu barómetro.

Ciencia para llevar a casa

Nombre _____

Fecha _____

Observemos la presión atmosférica

B. Anota

1. El día después de construir tu barómetro, llena la primera línea de la siguiente tabla. Anota la fecha y después vuelve a tomar otra lectura de tu barómetro. No te olvides de marcar el nivel del agua y de anotar la fecha en la taza. Anota si el nivel del agua es mayor, menor o igual al de tu primera lectura.

2. Usa Internet, un diario o el noticiero local para obtener datos sobre la temperatura, las precipitaciones y la presión atmosférica de ese día. Anótalos en la tabla.

3. Escribe una descripción o dibuja un diagrama sobre el estado del tiempo.

4. Repite los pasos 1 a 3 hasta que tengas datos del tiempo de cinco días. Luego, lleva la tabla completa a clase y comparte tus datos con tus compañeros.

Fecha	Nivel del agua en la taza (mayor, menor o igual al día anterior)	Condiciones climáticas del día	Diagrama o describe tus observaciones acerca del tiempo

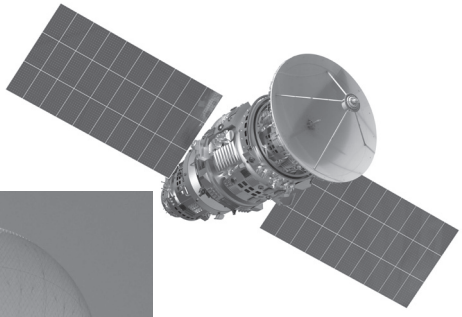
How Can Weather Technology Be Used?

If you have seen a weather report on TV, you have probably seen a meteorologist. Meteorologists report on the weather. They also predict the weather. Meteorologists use many tools to help them predict weather patterns. Knowing weather patterns can help meteorologists warn people when dangerous weather might be nearby.

Meteorologists can use technology to help them get data on weather above the ground. If you look up in the sky at the right time, you might see a weather balloon. When released, weather balloons rise through the atmosphere. The balloons carry weather tools that measure pressure, temperature, and the amount of moisture in the air. This data is sent to weather stations on the ground. The weather stations can also track the signal from the balloon. This information can reveal the wind speed and direction at different heights. Most weather balloons get as high as 20 miles above the ground! Eventually the balloon bursts. A parachute opens and gently returns the weather tools to the ground. If you find a weather balloon, open it! There are instructions inside on how to return it to be reused.

When you watch a weather report, you probably see an image formed by Doppler radar and images from satellites, too. Satellites monitor Earth's weather. There are satellites that orbit around the middle of Earth at the equator and satellites that orbit the poles. These satellites collect data on cloud formations, snow cover, fires, dust storms, and more. Doppler radar is a device that sends out radio waves. When the waves hit objects in the atmosphere, the waves spread out. Some of the waves bounce back to the radar. The bigger the object, the more waves that bounce back. The radar senses the returning waves. This information can help determine where and how hard rain is falling or which way a rainstorm is moving!

The next time you watch the weather, look for data gathered by these tools.



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Questions

1. How might using a weather balloon help a meteorologist forecast the weather?

2. How can a satellite help weather forecasting?

3. Why is data from Doppler radar about the heaviness of rain and its direction of movement helpful to meteorologists?

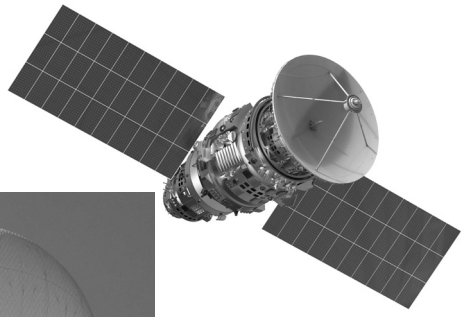
¿Cómo podemos usar la tecnología meteorológica?

Si alguna vez viste un informe sobre el estado del tiempo en la televisión, probablemente hayas visto a un meteorólogo. Los meteorólogos informan el estado del tiempo. También predicen el estado del tiempo. Los meteorólogos usan muchas herramientas que los ayudan a predecir patrones climáticos. Al saber los patrones climáticos, los meteorólogos pueden prevenir a las personas cuando se avecinan condiciones de tiempo peligrosas.

Los meteorólogos pueden usar la tecnología para obtener datos del tiempo encima del suelo. Si miras al cielo en el momento indicado, podrás ver un globo meteorológico. Cuando sueltas un globo meteorológico, asciende a través de la atmósfera. Los globos llevan herramientas climáticas para medir la presión, la temperatura y la cantidad de humedad en el aire. Estos datos llegan a las estaciones meteorológicas en tierra. Las estaciones meteorológicas también pueden realizar un seguimiento de las señales del globo. Esta información puede revelar la velocidad del viento y la dirección a distintas alturas. La mayoría de los globos meteorológicos pueden ascender a más de 20 millas del suelo. En algún momento, el globo se revienta. Entonces, se abre un paracaídas y las herramientas climáticas regresan con cuidado a tierra. Si encuentras un globo climático, ¡ábrelo! Dentro verás las instrucciones para que puedas devolverlo y reutilizarlo.

Cuando ves un informe sobre el estado del tiempo, seguramente ves una imagen formada por un radar Doppler y también imágenes satelitales. Los satélites monitorean el estado del tiempo en la Tierra. Hay satélites que giran alrededor de la mitad de la Tierra, en el ecuador, y satélites que giran alrededor de los polos. Estos satélites recolectan datos acerca de la formación de nubes, capas de nieve, incendios, tormentas de polvo y más. El radar Doppler es un dispositivo que envía ondas de radio. Cuando las ondas chocan contra objetos en la atmósfera, éstas se expanden. Algunas de las ondas rebotan y vuelven al radar. Cuanto más grande es el objeto, más rebotan las ondas. El radar detecta las ondas que retornan. Esta información ayuda a averiguar dónde cae la lluvia y con qué intensidad, o en qué dirección se mueve una tormenta.

La próxima vez que veas el informe del tiempo, busca la información que recolectan estas herramientas.



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Preguntas

1. ¿De qué manera el globo meteorológico puede ayudar a que un meteorólogo pronostique el estado del tiempo?

2. ¿Cómo ayuda un satélite a pronosticar el estado del tiempo?

3. ¿Por qué los datos del radar Doppler acerca de la cantidad de lluvia y la dirección en la que se mueve ayudan a los meteorólogos?

Name _____

Date _____

What Can a Weather Forecast Tell Me?

"This is Rachel Rainstorm, reporting for Channel 4 news from Orlando, Florida. This weekend the weather was extremely wet across the state. Because of unusually high afternoon temperatures and very humid air, summer storms popped up in many areas. Many of these storms were severe and caused a lot of damage.

"Thunderstorms raged across the state on both Saturday and Sunday evenings. These storms lit up the sky with lightning. There were 132 recorded lightning strikes on Sunday night alone. Wind gusts ranged from 40 to 58 mph. Many residents reported damaged roofs and fallen trees because of the high winds.

"Now let's look at the week ahead. We will see a dramatic change in our local weather. Gone are the high daily temperatures. We are looking at several cool, sunny days ahead.

"Expect daily highs to be in the mid-60s and lows to be in the middle 50s. The chance of rain will remain around 20 percent all week. Looks like a great week to get outside and enjoy the wonderful weather! I'm Rachel Rainstorm, giving you your weather roundup for Channel 4 news."

Questions

1. Rachel Rainstorm is forecasting during what season?

2. What led to weekend storms in the state?

3. What is the forecast for the week ahead?

4. Why is it helpful to know about the forecasted weather in your area?

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Nombre _____

Fecha _____

¿Qué es lo que puede informarme el pronóstico del tiempo?

"Mi nombre es Ana Aguacero, informando para el Canal 4 de noticias de Orlando, Florida. Este fin de semana, tuvimos muchísimas lluvias en todo el estado. Como las temperaturas por la tarde fueron inusualmente altas y había mucha humedad en el aire, se formaron tormentas de verano en varias zonas. Muchas de estas tormentas fueron graves y causaron muchos daños."

"Hubo tormentas en todo el estado durante la tarde-noche del sábado y del domingo. Estas tormentas encendieron el cielo con relámpagos. Durante la noche del domingo solamente, se registraron 132 rayos. Hubo ráfagas de viento de 40 a 58 mph. Muchos vecinos informaron de daños en los techos y árboles caídos como resultado de los vientos fuertes."

"Ahora veamos qué pasará durante la semana. Veremos un cambio drástico en el estado del tiempo local. Ya no tendremos altas temperaturas durante el día. Disfrutaremos de varios días de tiempo fresco y soleado."

"Las máximas diarias rondarán los 18 ºC y las mínimas estarán en aproximadamente 13 ºC. La probabilidad de lluvia será de alrededor del 20% durante toda la semana. Parece que será una semana hermosa para salir a pasear y disfrutar del clima hermoso. Mi nombre es Ana Aguacero, informándoles el estado del tiempo desde el canal 4 de noticias."

Preguntas

1. ¿En qué estación está pronosticando el estado del tiempo Ana Aguacero?

2. ¿Qué causó las tormentas durante el fin de semana en el estado?

3. ¿Cuál es el pronóstico del tiempo para la semana entrante?

4. ¿Por qué es útil saber el pronóstico del tiempo en tu área?

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Name _____

Date _____

Where On Earth Are Extreme Climates?

DDo you know what "extreme" means? It means the utmost, the greatest possible, the maximum! Some places on Earth have extreme climates. "Climate" refers to the long-term trends in weather patterns in an area. These trends are influenced by many things. Elevation, ocean currents, winds, and distance to the equator are just a few.

Where would you go to find the coldest temperatures on Earth? If you said Antarctica, you'd be right! Scientists there have recorded temperatures of –129°F! What makes this area's climate so cold? Much of Antarctica is covered with a thick sheet of ice. Antarctica is also the highest continent above sea level. The higher you go, the colder it is. Air also gets thinner as you go higher. The thin atmosphere over Antarctica has few clouds to trap heat. Antarctica is surrounded by water, which also makes it cold.

Now that you are shivering, let's go someplace warmer. Death Valley, California, holds the record for the highest recorded temperature: 134°F. It is also the driest place in North America. One reason for the extreme heat is its elevation. Death Valley has the lowest elevation in North America. It also is surrounded by mountains, which block moisture and keep heat from escaping. This causes the air in the valley to get hotter and hotter.

Need to cool off? How about some fun in the snow? One of the snowiest places on Earth is in Paradise, Washington. It averages 569 inches of snow each year. That's over 47 feet! Why all the snow? Paradise is in the northern part of the United States on the south slope of a mountain. The mountain funnels moisture-rich air down the slope, where it falls as snow.

Maybe you like your precipitation as rain. Mawsynram, India, receives almost 475 inches of rainfall a year. Why so much rain? This town is located where monsoons occur. A monsoon brings high wind and heavy rain. Wet monsoons are caused by winds moving cool, humid air from above the oceans to over hot land. The air warms and rises, and the water in the air falls as rain. The rains last for many months, and can even last for years!

Questions

1. How is climate different from weather?

2. How do mountains affect the climate of an area?

3. The text explains how a wet monsoon forms. Dry monsoons can happen, too. How do you think dry monsoons form?

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Nombre _____

Fecha _____

¿Dónde están los climas extremos?

¿Sabes lo que significa la palabra "extremo"? Significa "excesivo, lo máximo, lo mayor posible." Algunos lugares de la Tierra tienen climas extremos. Cuando hablamos del "clima", nos referimos a tendencias meteorológicas a largo plazo en un lugar determinado. Estas tendencias se ven influidas por muchas cosas. La elevación, las corrientes marinas, los vientos, la distancia al ecuador son sólo algunas.

¿Dónde irías para encontrar las temperaturas más frías de la Tierra? Si tu respuesta es "Antártida", entonces estás en lo cierto. ¡Los científicos han registrado temperaturas de –129 °F! ¿Por qué el clima en este lugar es tan frío? Gran parte de la Antártida está cubierta por una capa de hielo gruesa. Además, la Antártida es el continente con mayor altura sobre el nivel del mar. Cuando más alto estás, más frío hace. Y el aire es más delgado a medida que asciendes más. La atmósfera delgada que cubre la Antártida tiene pocas nubes para atrapar calor. La Antártida está rodeada de agua, que también la hace más fría.

Ahora que te dio frío, mejor vayamos a un lugar un poco más cálido. Death Valley, en California, tiene el récord de la temperatura más alta registrada: 134 °F. Además, es el lugar más seco de América del Norte. Una de las razones por las cuales hace este calor extremo es su elevación. Death Valley tiene la menor elevación de América del Norte. Además, está rodeado de montañas que bloquean la humedad y no permiten que el calor escape. Esto causa que el aire en el valle se caliente más y más.

¿Necesitas refrescarte? ¿Qué te parece algo de diversión en la nieve? Uno de los lugares más nevados de la Tierra es Paradise, Washington. En promedio, tiene 569 pulgadas de nieve por año. ¡Eso es más de 47 pies. ¿Por qué toda esa nieve? Paradise se encuentra en el norte de los Estados Unidos, en la pendiente sur de una montaña. La montaña canaliza el aire húmedo a través de la pendiente, donde cae en forma de nieve.

Quizá te gustan las precipitaciones en forma de lluvia. Mawsynram, India, recibe casi 475 pulgadas de lluvia por año. ¿Por qué tanta lluvia? Este pueblo se encuentra en zona de monzones. Los monzones traen vientos fuertes y lluvias copiosas. Los vientos que mueven aire frío y húmedo a través de los océanos hasta el suelo cálido causan los monzones húmedos. El aire se calienta y asciende, y el agua en el aire cae en forma de lluvia. Las lluvias duran muchos meses, ¡a veces hasta años!

Preguntas

1. ¿En qué se diferencian el clima y el tiempo?

2. ¿Cómo las montañas afectan el clima de un lugar?

3. El texto explica cómo se forma un monzón húmedo. Pero también existen los monzones secos. ¿Cómo crees que se forma un monzón seco?

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Name _____

Date _____

How Can Spinning Air Be Dangerous?

Have you seen the movie "The Wizard of Oz"? Dorothy and her dog are taken to Oz inside a tornado! While the movie is just a story, about 1,200 tornadoes are reported across the United States each year.

Tornadoes are spinning columns of air. They form several thousand feet about the ground inside a severe thunderstorm. When they come down to the ground, they move in a narrow path over land. Most tornadoes have wind speeds around 100 miles per hour (mph). However, the fastest known tornado had wind speeds of around 300 mph! The strong, spinning winds can sweep up dirt, tear roofs of buildings, and pull objects into the tornado. The winds may be strong enough to move large trees, trucks, houses, and even trains.

Tornadoes have been sighted in every state. But some areas have many more tornadoes than others. The Great Plains of the Central U.S. are nicknamed "Tornado Alley." In spring and summer, dry air in the west spreads over moist air moving up from the Gulf of Mexico. Storms moving east from the Rocky Mountains push this boundary eastward. Thunderstorms and tornadoes form along the line.

These same conditions can also cause hurricanes. Hurricanes often include thunderstorms. They also bring warm, moist air that slides under cool air above it. Updrafts in a hurricane can cause the winds to spin, forming tornadoes.

While tornadoes are dangerous, there are ways to stay safe:

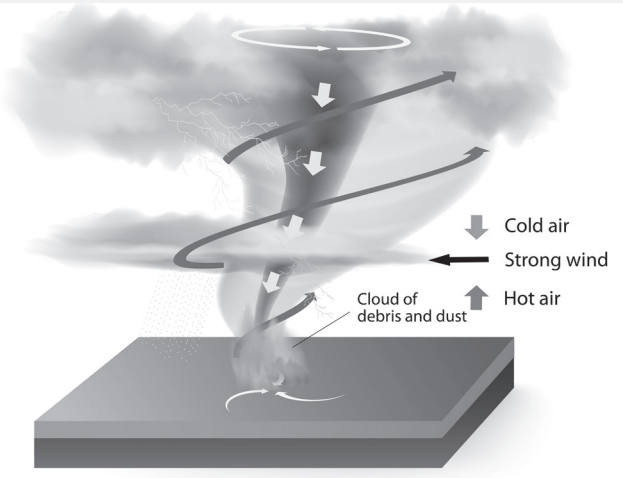
- If you are outside, stay in a ditch or low area. This can help protect you from flying objects.
- If you are inside, stay in a basement or storm cellar. A closet or bathroom will work, too.
- Stay away from windows and doors that lead outside. These can be blown apart by the wind.

Questions:

1. Think about the word "alley." Given what you know about alleys, what do you think the general shape of Tornado Alley might be?

2. How are the weather conditions in the Great Plains and those that cause a hurricane alike?

3. You are at home when a tornado warning is announced. You know you should take shelter. Where is the best place to go?



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Nombre _____

Fecha _____

¿Por qué la rotación del aire puede ser peligrosa?

¿Has visto la película "El mago de Oz"? Dorothy y su perro llegan hasta Oz dentro de un tornado. Si bien la película es sólo una historia, se registran alrededor de 1200 tornados por año en los Estados Unidos.

Los tornados son columnas de aire que giran. Se forman a cientos de metros sobre la tierra, dentro de una tormenta fuerte. Cuando tocan tierra, se mueven por un camino angosto. La mayoría de los tornados tienen vientos a velocidades que rondan los 100 millas por hora (mph). Sin embargo, el tornado registrado como el más rápido tenía vientos de alrededor de 300 mph. Los vientos fuertes y giratorios pueden barrer la tierra, arrancar techos de edificios y atraer objetos hacia el tornado. Es posible que los vientos tengan la fuerza suficiente para mover árboles grandes, camiones, casas y hasta trenes.

Se han visto tornados en todos los estados. Sin embargo, algunas áreas tienen muchos más tornados que otras. Las Grandes Llanuras en el centro de los Estados Unidos reciben el sobrenombre del "Corredor de los Tornados". En primavera y verano, el aire seco del oeste se expande sobre el aire húmedo que asciende desde el Golfo de México. Las tormentas que se mueven al este desde las Montañas Rocosas empujan este límite hacia el este. Sobre esta línea, se forman tormentas y tornados.

Estas son las mismas condiciones que pueden causar huracanes. Los huracanes suelen incluir tormentas. Y también traen aire caliente y húmedo que se desliza por debajo del aire más frío encima. Las corrientes ascendentes de un huracán suelen hacer que los vientos giren y formen tornados.

Si bien los tornados son peligrosos, hay formas de refugiarse:

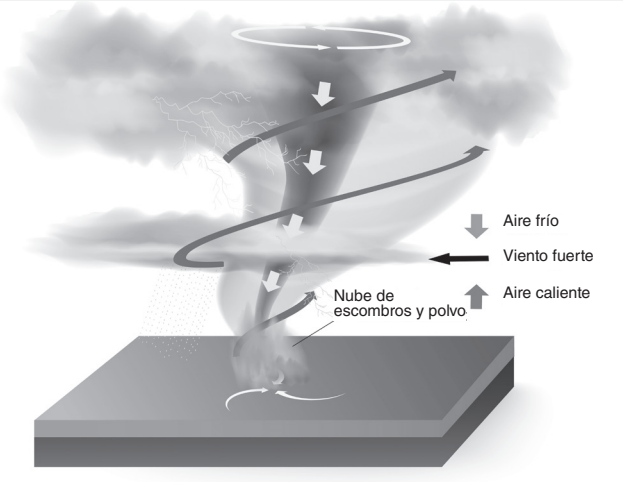
- Si estás al aire libre, quédate en una cuneta o en un área baja. Así podrás protegerte de objetos voladores.
- Si estás bajo techo, quédate en la bodega o en el sótano para tormentas. También sirven un armario o un baño.
- Quédate alejado de ventanas y puertas que lleven al exterior. El viento puede hacerlas volar en pedazos.

Preguntas:

1. Reflexiona acerca de la palabra "corredor". Según lo que sabes acerca de los corredores, ¿a grandes rasgos, qué forma crees que tiene el Corredor de los Tornados?

2. ¿En qué se parecen las condiciones de tiempo en las Grandes Llanuras y las que pueden causar un huracán?

3. Estás en tu hogar y se anuncia una advertencia de tornado. Sabes que debes refugiarte. ¿Cuál es el mejor lugar al que puedes ir?



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Teacher Sheet: Science in the News Article Report

To help students understand a concept, it is often helpful to associate it with an event or phenomenon. Depending on the topic, students may be able to draw connections to recent events in the news or to historical events in your area. Using a literacy tool like an article report is a helpful way to bring in literacy, reading comprehension, and science topics at any grade level.

Science in the News articles can be assigned at any point during a unit to assist students in seeing the "real-world connection" to a particular concept. These articles should be provided by the teacher in lower grades, but students in grades 3–5 may be ready for the challenge of selecting their own articles independently. The following guidelines will help you find appropriate articles. If you ask students to locate their own articles, you may wish to provide some of these guidelines along with the specific requirements for the assignment. Students at all grades are provided with an article report sheet to help them analyze their article and draw connections between it and the unit concepts. For students in grades 3–5, a rubric is provided in this appendix to help them to evaluate an article for bias and credibility.

1. Choose a topic that aligns with content

- Look for an article that will be engaging to students. It might be helpful to use local news sources or current events. Try to find a topic that students will be able to relate to and find interesting. For example, students will find greater interest in relating chemical reactions to cooking than in a laboratory setting.

2. Seek appropriate articles

- Typical news sites contain text that is likely too complex for elementary students. Use a search engine to find websites that provide kid-friendly news. Many of these websites align their content by grade level and cover a variety of topics.

- Though news is more frequently updated on websites, it is also possible to use text sources, such as kid-friendly newspapers or magazines.

3. Determine the credibility of the source

- It is very important to choose an article from a credible source to avoid bias and false news. Use the credibility rubric to assess sources before selecting articles.

4. Read the article

- Once you have chosen an article of interest, read it to determine its connection to the unit content. Take note of any new or unfamiliar terms so they can be reviewed later.

Differentiation Strategy If you are selecting the article, consider editing the text to differentiate instruction.

5. Ask students to read the article and complete an article report sheet. Remind them to:

- Provide information about where the article was found.
- Answer questions about the current event and draw connections to what they have learned during the unit.

Science in the News: **Article Report**

Name: _____

Date: _____

Title of article: _____

Author: _____

Date published: _____

Source: _____

Type of news: ___ Local ___ National ___ International

1. Summarize your article. What happened? When did it happen? Who was involved? Where did it happen? Why did it happen? _____

2. Why is this article important? _____

3. What did you learn from this article? Was anything surprising? _____

Name: _____

Date: _____

Write one question you have after reading the article. _____

_____

_____

_____

How does this article relate to the topics covered in this unit? _____

_____

_____

_____

Science in the News: Article Credibility Rubric

Directions: Use the rubric to determine the credibility of your Science in the News article.

Criteria	3	2	1	Rating
Author	The author's name is easy to find.	Author's name is not easy to find.	The author's name cannot be found.	
Source/ Publisher	The source of the article is well-known and contains many news reports.	The source of the article does not contain many news reports. I have never heard of the publisher.	The source of this article does not have many news reports.	
Update frequency	This event occurred recently.	This event occurred within the past five years.	This event occurred many years ago.	
Opinion/ Bias	The article reports on an event and does not provide opinion.	The article contains facts, but also the author's opinion.	The article contains the author's opinion and presents information that may not be fact.	
Science Impact	Scientific findings and results appear to be accurate and has strong evidence for support.	The scientific findings might be exaggerated and do not have evidence. I do not understand the scientific findings.	The science discussed in the article is incorrect and there is no evidence.	

1. Do you think this news article is credible? Explain why or why not. _____

_____

_____

How Can Weather Technology Be Used?

If you have seen a weather report on TV, you have probably seen a meteorologist. Meteorologists report on the weather. They also predict the weather. Meteorologists use many tools to help them predict weather patterns. Knowing weather patterns can help meteorologists warn people when dangerous weather might be nearby.

Meteorologists can use technology to help them get data on weather above the ground. If you look up in the sky at the right time, you might see a weather balloon. When released, weather balloons rise through the atmosphere. The balloons carry weather tools that measure pressure, temperature, and the amount of moisture in the air. This data is sent to weather stations on the ground. The weather stations can also track the signal from the balloon. This information can reveal the wind speed and direction at different heights. Most weather balloons get as high as 20 miles above the ground! Eventually the balloon bursts. A parachute opens and gently returns the weather tools to the ground. If you find a weather balloon, open it! There are instructions inside on how to return it to be reused.

When you watch a weather report, you probably see an image formed by Doppler radar and images from satellites, too. Satellites monitor Earth's weather. There are satellites that orbit around the middle of Earth at the equator and satellites that orbit the poles. These satellites collect data on cloud formations, snow cover, fires, dust storms, and more. Doppler radar is a device that sends out radio waves. When the waves hit objects in the atmosphere, the waves spread out. Some of the waves bounce back to the radar. The bigger the object, the more waves that bounce back. The radar senses the returning waves. This information can help determine where and how hard rain is falling or which way a rainstorm is moving!

The next time you watch the weather, look for data gathered by these tools.

Questions

1. How might using a weather balloon help a meteorologist forecast the weather? *(Students should recognize that weather balloons carry weather tools that measure pressure, temperature, and moisture in the air. These balloons then send that data to weather stations on the ground. Knowing this information can help a meteorologist forecast when different types of weather will arrive at a given location.)*

2. How can a satellite help weather forecasting? *(A satellite can collect data on clouds, snow, and dust storms to help predict weather.)*

3. Why is data from Doppler radar about the heaviness of rain and its direction of movement helpful to meteorologists? *(This data allows meteorologists to give early alerts about heavy rains that could be dangerous.)*

What Can a Weather Forecast Tell Me?

"This is Rachel Rainstorm, reporting for Channel 4 news from Orlando, Florida. This weekend the weather was extremely wet across the state. Because of unusually high afternoon temperatures and very humid air, summer storms popped up in many areas. Many of these storms were severe and caused a lot of damage.

"Thunderstorms raged across the state on both Saturday and Sunday evenings. These storms lit up the sky with lightning. There were 132 recorded lightning strikes on Sunday night alone. Wind gusts ranged from 40 to 58 mph. Many residents reported damaged roofs and fallen trees because of the high winds.

"Now let's look at the week ahead. We will see a dramatic change in our local weather. Gone are the high daily temperatures. We are looking at several cool, sunny days ahead.

"Expect daily highs to be in the mid-60s and lows to be in the middle 50s. The chance of rain will remain around 20 percent all week. Looks like a great week to get outside and enjoy the wonderful weather! I'm Rachel Rainstorm, giving you your weather roundup for Channel 4 news."

Questions

1. Rachel Rainstorm is forecasting during what season? *(Summer)*

2. What led to weekend storms in the state? *(Unusually high humidity and warmer afternoon temperatures caused the storms.)*

3. What is the forecast for the week ahead? *(Cooler temperatures [50–70˚F] with sun and a 20 percent chance of rain)*

4. Why is it helpful to know about the forecasted weather in your area? *(Knowing the local forecast can help you plan activities, choose what to wear, or prepare for a storm.)*

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Where On Earth Are Extreme Climates?

Do you know what "extreme" means? It means the utmost, the greatest possible, the maximum! Some places on Earth have extreme climates. "Climate" refers to the long-term trends in weather patterns in an area. These trends are influenced by many things. Elevation, ocean currents, winds, and distance to the equator are just a few.

Where would you go to find the coldest temperatures on Earth? If you said Antarctica, you'd be right! Scientists there have recorded temperatures of –129°F! What makes this area's climate so cold? Much of Antarctica is covered with a thick sheet of ice. Antarctica is also the highest continent above sea level. The higher you go, the colder it is. Air also gets thinner as you go higher. The thin atmosphere over Antarctica has few clouds to trap heat. Antarctica is surrounded by water, which also makes it cold.

Now that you are shivering, let's go someplace warmer. Death Valley, California, holds the record for the highest recorded temperature: 134°F. It is also the driest place in North America. One reason for the extreme heat is its elevation. Death Valley has the lowest elevation in North America. It also is surrounded by mountains, which block moisture and keep heat from escaping. This causes the air in the valley to get hotter and hotter.

Need to cool off? How about some fun in the snow? One of the snowiest places on Earth is in Paradise, Washington. It averages 569 inches of snow each year. That's over 47 feet! Why all the snow? Paradise is in the northern part of the United States on the south slope of a mountain. The mountain funnels moisture-rich air down the slope, where it falls as snow.

Maybe you like your precipitation as rain. Mawsynram, India, receives almost 475 inches of rainfall a year. Why so much rain? This town is located where monsoons occur. A monsoon brings high wind and heavy rain. Wet monsoons are caused by winds moving cool, humid air from above the oceans to over hot land. The air warms and rises, and the water in the air falls as rain. The rains last for many months, and can even last for years!

Questions

1. How is climate different from weather? *(Weather changes from day to day. Climate is the average weather pattern in an area over a period of time.)*

2. How do mountains affect the climate of an area? *(Answers will vary. Mountains can trap in heat. They can funnel heat or cold into an area. Areas located on high mountains have colder climates because of height above sea level and lack of cloud cover.)*

3. The text explains how a wet monsoon forms. Dry monsoons can happen, too. How do you think dry monsoons form? *(Answers will vary. Students should infer that since wet monsoons are the result of cool, wet air moving over hot land, dry monsoons might be caused by wind moving hot, dry air from the land to the ocean.)*

How Can Spinning Air Be Dangerous?

Have you seen the movie "The Wizard of Oz"? Dorothy and her dog are taken to Oz inside a tornado! While the movie is just a story, about 1,200 tornadoes are reported across the United States each year.

Tornadoes are spinning columns of air. They form several thousand feet about the ground inside a severe thunderstorm. When they come down to the ground, they move in a narrow path over land. Most tornadoes have wind speeds around 100 miles per hour (mph). However, the fastest known tornado had wind speeds of around 300 mph! The strong, spinning winds can sweep up dirt, tear roofs of buildings, and pull objects into the tornado. The winds may be strong enough to move large trees, trucks, houses, and even trains.

Tornadoes have been sighted in every state. But some areas have many more tornadoes than others. The Great Plains of the Central U.S. are nicknamed "Tornado Alley." In spring and summer, dry air in the west spreads over moist air moving up from the Gulf of Mexico. Storms moving east from the Rocky Mountains push this boundary eastward. Thunderstorms and tornadoes form along the line.

These same conditions can also cause hurricanes. Hurricanes often include thunderstorms. They also bring warm, moist air that slides under cool air above it. Updrafts in a hurricane can cause the winds to spin, forming tornadoes.

While tornadoes are dangerous, there are ways to stay safe:

- If you are outside, stay in a ditch or low area. This can help protect you from flying objects.
- If you are inside, stay in a basement or storm cellar. A closet or bathroom will work, too.
- Stay away from windows and doors that lead outside. These can be blown apart by the wind.

Questions:

1. Think about the word "alley." Given what you know about alleys, what do you think the general shape of Tornado Alley might be? *(Students will probably suggest that Tornado Alley is a long, thin stretch of the country.)*

2. How are the weather conditions in the Great Plains and those that cause a hurricane alike? *(Both have warm, moist air below a layer of cooler air. They both have storms that cause the wind to rotate.)*

3. You are at home when a tornado warning is announced. You know you should take shelter. Where is the best place to go? *(Students may say a basement, storm cellar, or an interior bathroom or closet.)*