

WEATHER

Calendar Connections Cards

Target Level: grades 3-6

The facts are created at a more advanced level but can easily be used for the entire homeschool family!
Young children will soak up the information their older siblings are taught while all together.

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Calendar Connections Cards

In this file you will find a one page set of mini cards. These can either be cut up for a mini pocket chart calendar, or leave the page whole and add to a [calendar notebook!](#)

You will also find the larger image cards and fact cards – these do NOT print front to back. Print the image cards for your calendar {laminare if possible} and keep the information cards separate on a metal ring or behind the image cards in the calendar. [See the calendar we use here.](#)



Calendar Connections Supplies





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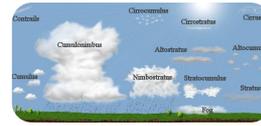
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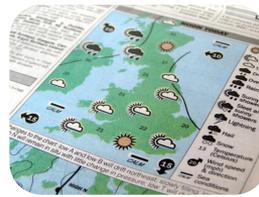
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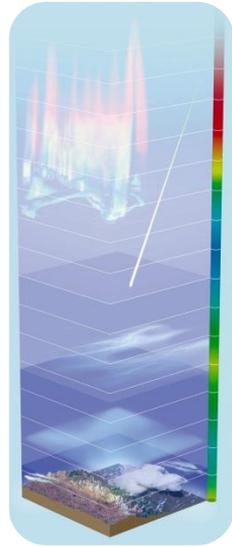
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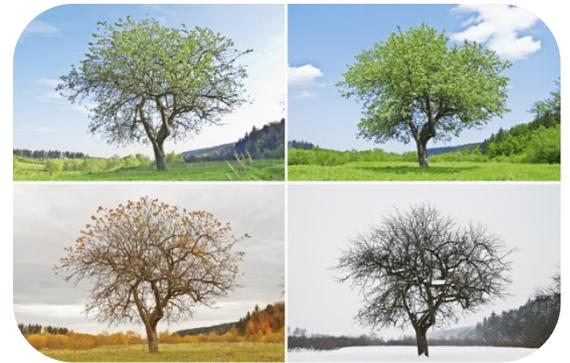
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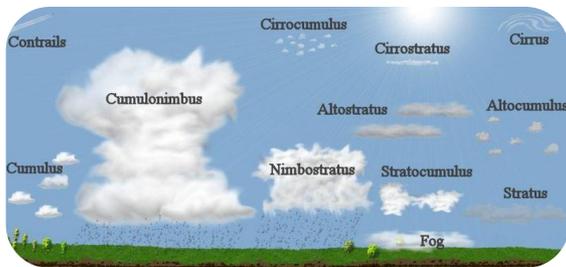
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<p>1 What is weather?</p> <p>Before we start this theme take a moment to look out your window. What did you see? Did you see it raining or snowing? Was it sunny or cloudy? Did you feel cold or hot? You were noticing the weather!</p> <p>"Weather" is what the air and sky outside are like – sunny, cloudy, windy, or snowy. Weather is determined by the energy of the Sun and the moisture in the air. There are many different kinds of weather in our world and many different ways it affects our lives! There are many different activities you can do during this month long study – graph the weather/temperature, build some of the weather instruments, create art! But most of all – have fun!</p>	<p>2 Troposphere</p> <p>Surrounding the Earth is a wide band of air which we call the atmosphere. There are several different layers: the troposphere, stratosphere, mesosphere, and the thermosphere. Weather only occurs below the cloud tops, in the area known as the troposphere. The average depth of this layer of the atmosphere is 11 miles. The word troposphere originates from the Greek. <i>Tropos</i> means "mixing" or "turning" suggesting the turbulent behavior of this layer.</p>	<p>3 Seasons</p> <p>The Earth is a sphere that is tilted on an axis. This tilt causes one half of the Earth to get more sunlight than the other at any one time, making it sunnier! The sunny half is experiencing summer, while the other part is encountering winter! As the Earth spins around the Sun the seasons change. There are four seasons – summer, fall, winter and spring. Each season has a different tilt towards, or away from the Sun that determines its temperature, weather, and length of daylight. Places near the equator, the imaginary ring around the center of the Earth, are always sunny so the temperature is warm all year!</p>
<p>4 What's the Sun got to do with the weather?</p> <p>Well, everything! The heat from the Sun turns the moisture from leafy plants and trees, as well as from lakes and oceans, into invisible water vapor in the air. This process is called evaporation. This water vapor collects in the sky to form clouds. When the clouds get too full of water droplets, they fall to the ground as raindrops. If the air is cold enough the drops turn into snowflakes. This precipitation falls back into the trees, ground, and bodies of water and the process starts all over again! The Sun also produces wind. The rays of the Sun warm pockets of air which causes them to rise. Cool air rushes in to fill the empty space. We call that movement of air wind!</p>	<p>5 Clouds</p> <p>Clouds are formed from drops of water. There are three main types of clouds – stratus, cumulus, and cirrus and many combinations of these. The type of cloud is determined by the amount of water in each cloud, its height in the sky and the air temperature. Clouds that have "nimbus" or "nimbo" in their name are rain clouds. The majority of clouds form in the troposphere, though there are times when they form in the stratosphere and mesosphere.</p>	<p>6 Stratus</p> <p>Of the three main types of clouds we will discuss, stratus clouds are the lowest in the sky. In Latin, stratus means "layer", though the layers are not always defined. Stratus clouds are flat, featureless clouds that often just make the sky look gray. These are the clouds that block the sun on a cloudy day. Stratus clouds usually produce minor precipitation such as a light drizzle or snow.</p>



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Cirrus

A second type of cloud is the cirrus cloud. These clouds are characterized by high, thin, wispy, feathery strands giving them their name from the Latin word *cirrus* meaning "ringlet" or "curling lock of hair". Only cold air is present at the height in the sky in which these clouds appear. These clouds are actually made from ice crystals rather than water drops. Sometimes strong winds blow these clouds into long strands or "mare's tails" because they look like horse's tails.

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Cumulus

The third and final type of cloud is the cumulus cloud. *Cumulus* means "heap" or "pile" in Latin. These clouds resemble cotton balls – they are plump and fluffy. They generally appear on clear sunny days but are often the forerunner of other inclement weather clouds. Cumulus clouds can grow into big, black clouds called cumulonimbus which may produce rain, snow, hail or even tornadoes.

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Fog/ Mist

Have you ever walked outside and felt you were walking in a cloud? Well, you really were! Fog is a type of stratus cloud that is sitting on the ground rather than floating in the air. When the ground loses heat and gets very cold, it cools the air above it making water vapor condense into fine drops. As the Sun warms the air, the moisture evaporates and the fog disappears. Fog reduces the distance at which you can see – or your visibility. In ordinary fog you can see about 1,100 yards ahead of you. In thick fog you can only see 55-220 yards. In dense fog you can see less than 55 yards in front of you.

There is only one characteristic that distinguishes fog from mist – it's density. Mist is finer and lighter than fog.

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Rain, Rain Go Away!

As we discussed a few days ago, clouds are made up of tiny droplets of water. When a cloud takes on more water, the tiny droplets grow bigger. In time, they get so heavy that they fall to the ground as drops. Small drops are called drizzle and large, heavy ones are called rain. Drizzle falls more slowly than rain since it is much finer. It takes about 700 drizzle drops to make one raindrop. Rain clouds are so dense and heavy with water that light can not penetrate – this is why they look so dark and scary! The bigger and blacker the cloud, the heavier the rainfall will be! Every area of the world has what is known as an average yearly rainfall. Arica, Chile in South America averages 0.03 inches a year! While Kauai, Hawaii averages 460 inches a year! What is your average yearly rainfall?

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Snow

When the air temperature hits 32* F, or freezing, the moisture in the clouds freezes into ice crystals without turning into rain first. These crystals stick together and float to the ground as snowflakes. Most snowflakes have six points and look like little stars. It is thought that there are no two snowflakes that look exactly alike! Why is snow white? Because it reflects nearly all the light that hits it. The heaviest snows fall in areas where the temperature is just below freezing. Very, very cold places rarely ever get any snow.

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Blizzard

Is there a difference between a snowstorm and a blizzard? Yes! The strength of the wind. To be a blizzard, the winds have frequent gusts or sustained speeds of at least 35 mph. There must also be drifting snow and reduced visibility to a quarter mile or less for a prolonged period of time – three hours or more. Sometimes, even when it has stopped snowing, the wind whips the snow from the ground around giving the illusion that it is still snowing! Blizzards are dangerous, especially to regions that are use to little snowfall. Iran, which has an average precipitation of 12 inches a year, had a blizzard in 1972. It killed more than 4,000 people.



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13**Hail**

When solid white balls of ice fall from the sky we call it hail. Hailstones can vary in size, from tiny pea size to the size of a plum. Hail starts out as tiny ice crystals. These ice crystals get caught up in the strong freezing winds whirling around in the clouds. They rise up high into the clouds then fall, collecting moisture on the way. Then it gets pulled back up, freezing in the cold air at the top of the cloud.

Each trip up and down the cloud adds another layer of ice. When the ball of ice gets too heavy it falls out of the sky. The largest hailstone ever recorded measured 17 inches across!

14**Dew/ Frost**

Have you ever woken up on a cool summer morning and caught sight of a sparkling web wet with little droplets of water? It almost looks like tiny diamonds sparkling in the sun! This is dew. On cool nights, moisture in the air turns into water and drops to the ground covering everything with dew. On freezing cold days, dew hardens into frost. When we see the world all sparkling white and the windows covered in lacy ice crystals people often say Jack Frost was at work!

15**Wind**

What is something you can't see but you know it is present? The wind!!!

The air on Earth is always moving. When it moves quickly enough for you to feel it on your skin we call it wind. The Sun's heat and the way the Earth turns create wind patterns. Near the equator winds blow in an easterly direction. Farther away and they change to a westerly direction. Bands of high winds called jet streams go around the Earth from west to east. They are so strong that pilots can take hours off their flight time if they travel with the current! A light wind is called a breeze. The strongest winds are called gales. Winds are measured in terms of force. A Force 0 is calm while a Force 12 is a hurricane.

16**Lightning**

Do flashes in the sky during a storm send you running under your covers? Lightning! What is it exactly? Lightning bolts are created when the ice and water inside storm clouds rub together creating huge electrical charges. These electrical charges travel at a speed of 23,000 miles per second! Some bolts can be up to 4 miles in length. Lightning chooses many different paths to travel. It can flash inside a cloud, between a cloud and the air nearby, between two clouds, and between a cloud and the ground below. When it does flash the air around it is heated five times hotter than the Sun's surface! Never find shelter under a tree if caught in a lightning storm as lightning is attracted to anything that stands high above the ground.

17**Tornadoes**

Tornadoes are large horrifying funnel clouds of spinning air. They begin as warm air drawn into the base of huge storm clouds. Since warm air is lighter than cool air it rises quickly. The warm air then starts filtering down in a spinning motion. If it spins fast enough it touches the ground and forms a lethal funnel cloud. The winds at the center of a funnel can reach speeds of 250 mph! Central United States has more tornadoes than any other place on Earth, hence the nickname "Tornado Alley". In April of 1974, 148 twisters hit this area in a matter of 16 hours.

18**Hurricanes**

The most violent and destructive storms on Earth are hurricanes. They start out as small storms, then build into swirling clouds of wind and rain. These small storms usually begin in tropical areas where they gather their power from the heat of the sea and are actually aided by the fact that the Earth turns faster near the equator! At the center of each hurricane is the eye of the storm – a calm patch within the storm. The deadliest winds spin around the eye of the storm. Hurricanes are graded from 1 to 5 with 5 being the worst. Since the 1940's hurricanes have been given human names – first just girls' names, until the 1970's when they started alternating boys' names one year and girls' names the next.



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Tsunami

A tsunami (soo-nah-mee) is a series of water waves caused by the dislocation of a large portion of water (usually the ocean) due to an underwater explosion (Earthquake or volcanic eruption). These waves are not the same as those seen at the beach. They are much taller and longer and resemble a rapidly rising tide which is also why they are known as "tidal waves". It is not only the force at which the wave crashes into an area that is dangerous, but the massive amount of water draining back into the ocean carrying everything with it. Tsunamis generally consist of a series of waves with periods ranging from minutes to hours, arriving in a so-called "wave train".

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Drought

We all love bright, beautiful sunny days! But too many sunny days in a row can cause a drought. A drought is when there is an extended period of time (at least 14 days) when an area experiences below average precipitation. Droughts can occur all over the world. Statistics indicate that every 22 years a major drought affects the United States, usually the Midwestern states. The drought of 1933-35 which affected the Great Plains became known as the Dust Bowl. Though we can't predict droughts we can do things to help alleviate them including building reservoirs to hold emergency water supplies and avoid over cropping (planting too much using up all the nutrients in the soil) and overgrazing.

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Rainbows

Light is made up of seven colors: red, orange, yellow, green, blue, indigo, and violet. When the Sun shines through raindrops, its light bends and reflects off the water. The different colors bend at different angles, though. This separates them into the layered bands of light we call a rainbow. Rainbow colors always appear in the same order with red at the top and violet at the bottom.

22 Weather Forecasting

When you woke up this morning did you look outside your window to see what the weather was like? Did you decide what to wear based on what you saw or felt? We all depend on weather forecasts – weather predictions based on scientific observations - to help us plan our activities. Should we go to the beach or the museum this weekend? Meteorologists, people who study weather, use many different instruments to help them forecast the weather. Over the next few days we'll look at some of them.

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Anemometer

Can you guess what this strange instrument is used to measure? If you guessed wind speed you would be correct! Air flows past the cups in a horizontal direction, causing the cups to turn. Counting each full rotation of the cups over a set period of time produces the average wind speed. The wind speed is measured by the number of revolutions per minute (RPM). An anemometer was first designed with four cups, but in 1935 it was discovered that three cups lead to a more accurate wind speed reading and also responded faster to wind gusts.

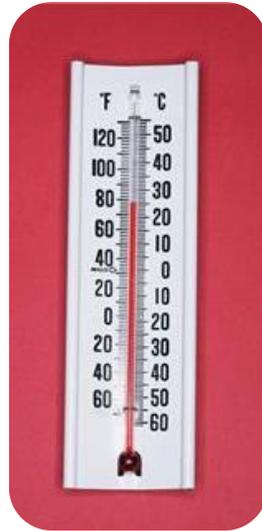
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Barometer

A barometer is an instrument used to measure atmospheric pressure. When used in combination of other observations, such as wind, it can help predict short-term weather forecasts. High atmospheric pressure readings suggests nice weather as the pressure blocks inclement weather systems. Low atmospheric pressure readings point to clouds and potential precipitation. The larger the pressure change, the larger the change in weather.



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25 Rain Gauge

This tool does exactly what its name indicates – it gauges, or measures, rainfall over a set period of time. A standard rain gauge consists of a funnel attached to a graduate cylinder about 2 cm in diameter. This container is then fitted into a larger container (20 cm in diameter and 50 cm tall) to catch any overflow from the smaller cylinder within. A rain gauge must be placed in an open area (away from trees, buildings, etc.) to achieve an accurate reading. The gauge has a few limitations. During a hurricane strong winds prevent rain from entering the funnel making it nearly impossible to get an accurate reading. Also, if the temperature is near freezing the rain could freeze on the funnel and stop rain from entering the gauge.

26 Thermometer

Thermometer is a word from the Greek – *thermos* meaning “warm” and *meter* meaning “to measure”. As its name indicates it measures the warmth or temperature of something. Thermometers have two scales of measurement – Fahrenheit and Celsius. Most countries use Celsius as the official scale. Fahrenheit, however, is the official scale of the United States, Cayman Islands, and Belize. On a Fahrenheit scale 32* is freezing and 212* is boiling. On a Celsius scale, however, 0* is freezing and 100* is boiling.

27 Weather Balloons

Large balloons, filled with hydrogen or helium gas, are slowly sent 25 feet into the air at which point the balloon bursts due to the enormous air pressure. Attached to the balloon are instruments that measure temperature, wind, and moisture and radio the results back to Earth. Scientists at weather stations around the world gather this information and pass it along to other scientists in other countries so that they can forecast their weather.

28 Capturing the Weather

Weather isn't something we can control, but scientists are learning how to capture its power and convert it into energy. Electricity generated by water (waterfalls, waves, etc.) is known as hydroelectric power. Huge mirrored panels collect the Sun's rays and is known as solar energy. Large areas of land covered with wind turbines (modern windmills) called wind farms create energy. The last two forms of energy produce only a small amount for now, but scientists are continuing to work on this technology.

29 Wild Weather

Do you ever think about the weather out at sea? It works the same way as it does on land, but the end results are often very different. Since there are no obstacles to block the wind they are more powerful and can push seawater into waves 98 feet high! When whirlwinds and tornados form out at sea they are called waterspouts. Hundreds of years ago sailors believed these were caused by sea monsters.

Did you know when seawater freezes into ice all the salt is left behind in the surrounding water? It's not salty anymore!

30 Golden Glow

Did you know that those beautiful sunsets and sunrises you see are actually caused by dust? The dust particles float up into the atmosphere and are reflected by the Sun's rays as they slip down below or rise above the horizon. Sailors made up rhymes that suggested the meaning behind fiery sunsets and sunrises –

Red sky at night, sailors' delight;
Red sky in the morning, sailors take warning.



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31 “I have swept away your offenses like a cloud, your sins like the morning mist. Return to me, for I have redeemed you.”

Isaiah 44:22