

SEASONAL CHANGES: KEY STAGE 1

LINKS TO NATIONAL CURRICULUM

Science

- Observe changes across the four seasons (*Year 1, Seasonal Changes*).
- Observe and describe weather associated with the seasons (*Year 1, Seasonal Changes*).
- Observe and describe how day length varies in different seasons (*Year 1, Seasonal Changes*).
- *Make tables and charts about the weather.*
- *Make displays of what happens in the world around them, including day length, as the seasons change.*

KEY LEARNING OBJECTIVES

- 1. To name and describe the four seasons**
- 2. To observe and describe weather associated with the seasons, and how day length varies**
- 3. To understand ways of measuring the weather**
- 4. To understand that some types of weather can be dangerous**

Note to Teachers

- Activities given are suggestions only. The main purpose of the lesson plans and PowerPoint presentation is to provide key information and visual aids for teachers to adapt to their needs.
- The PowerPoint presentation runs alongside the plans and all slides are referred to in the lesson plans. Please feel free to modify the presentation by adding your own slides or deleting those you don't need.
- **There is a wealth of fact sheets and other downloadable publications on the Better Planet Education website. These will provide additional information if you wish to focus on a particular topic and also enable children to carry out their own research.**

KEY WORDS (in alphabetical order)

Atmosphere – the air and gases surrounding the Earth.

Blizzard – a swirling snowstorm.

Climate - the average of the weather conditions in an area over a long period of time.

Cloud – water vapour that has condensed in the air.

Deciduous trees - lose all of their leaves for part of the year. In cold climates this happens during the autumn, so trees are bare throughout the winter.

Drought - a long period of time with no rainfall.

Flood – when water lies deep on the ground and doesn't soak down or drain away.

Fog – clouds of water vapour that form near the ground.

Hibernate – to sleep all through the winter.

Hurricane - an extremely large, powerful and destructive tropical storm with very strong winds.

Lightning – electricity built up in a cloud that jumps to the ground.

Meteorologist – a scientist who studies the weather.

Rain – water droplets that fall from clouds.

Rain gauge – equipment used to measure rainfall.

Rainbow – the sun shining through droplets of water, which splits the light into its various colour parts.

Seasons - divisions of the year that are often characterised by changing weather patterns. The four seasons (autumn, winter, spring, summer) we experience on our planet are caused by the Earth's tilt as it rotates around the Sun.

Snow – frozen rain in clouds that has formed ice crystals.

Storm – extreme weather featuring strong wind and rain, often includes thunder and lightning.

Sun - the burning star in our solar system that gives Earth its heat and light.

Temperature – how hot or cold the air is

Thermometer – A tool that measures temperature.

Thunder – the noise created when air warms up suddenly after a bolt of lightning.

Weather - the daily state of the atmosphere in any given place.

Weather forecast – predicting what the weather will be like over the next few days.

Weather station – a place where weather measuring equipment is set up.

Wind – movement of air in the atmosphere.

1. What are the four seasons?

By the end of this suite of lessons, children should be able to describe weather types including wind, rain, sun, fog and snow. Children should be able to describe each season and the associated weather conditions.

Despite our weather in the UK being very changeable, it is possible to identify certain characteristics of our four seasons. Spring often has mild temperatures and can have heavy rainfall. In summer temperatures are warmer and rainfall is generally less frequent. In autumn temperatures begin to cool, leading to winter where temperatures are often at their lowest. Winter can sometimes bring snow. Seasons occur due to the tilt of the Earth on its axis, which affects the number of daylight hours we experience.

Throughout this suite of lessons, children will observe weather conditions outdoors.

As part of this sequence of lessons, it might be possible to take photographs of the class outdoors over the different seasons. Doing this alongside a nursery or Reception class can provide relevant photographs for use when those children arrive into Year 1. It's useful to include features such as a deciduous tree.

SUGGESTED STARTER ACTIVITY

Discuss with the children what they understand by the term “seasons”. Complete the 4 seasons sheet (see below) prior to the lessons individually or in groups, to inform assessment throughout the suite of lessons.

TEACHER INPUT

Slide 4: The four **seasons** are spring, summer, autumn and winter. These seasons happen over and over again in the same order. A pattern like this is called a cycle.

Slides 5–10: Autumn comes after summer. The autumn months are September, October and November. In autumn, the air outside starts to get cooler. The **sun** shines for a little less time each day. In the UK, the leaves change colour and fall off certain types of trees in autumn (nb – children learn about **deciduous** trees in the ‘plants’ lessons in Y1 - <http://ypte.org.uk/lesson-plans/plants-year-1-year-2-key-stage-1>).

Children may be familiar with gathering conkers at this time of year. Fruits and nuts ripen on many trees and plants in the Autumn. Farmers harvest their crops and some animals store food for the winter.

Slides 11 – 13: Winter is the coldest season. In some places, **snow** and ice cover the ground during winter time. The winter months are December, January and February. Even in places that don’t have snow and ice, it is still colder in winter than in the other seasons. Some animals, such as squirrels and hedgehogs, sleep during the winter season. This is called **hibernation**. In the winter, the days are shortest. Children may notice that it is dark when they get up for school, or before they go to bed.

Slide 14: Shows children playing in a snowy park. People wrap up warm in the winter because the temperature outside is so cold.

Slides 15 - 18: As winter ends, spring begins. In the spring the sun shines a little longer each day, **temperatures** begin to get warmer and the snow and ice melt. The spring months are March, April and May. Spring can often bring rain. New leaves begin to grow from the trees and new plants grow up from the earth. Flowers begin to bloom again. Many baby animals are born during the spring, too.

Slides 19-22: After spring comes summer. Summer is the hottest season of the year in the UK. The summer months are June, July and August. It is the season in which plants are full of leaves, flowers, and fruit. The days have the longest amount of sunshine during the summer. Children may notice that they have to go to bed long before it gets dark!

Slide 23: When it is warm in the summer, people might go to the beach or play outside. They wear clothes that keep them cool, or swimsuits at the beach. The sun's rays can burn, so people wear sun cream.

Slide 24: Why do we experience seasons? NOT TO SCALE!

Earth's axis is an imaginary pole going right through the centre of the Earth from "top" to "bottom." Earth spins around this pole, making one complete turn each day. This is why we have day and night.

Earth has seasons because this axis is tilted sideways. So, when the North Pole tilts toward the Sun, the Northern Hemisphere (where the UK is) gets more daylight hours each day and it is Summer. When the South Pole tilts toward the Sun, it's winter in the Northern Hemisphere and there are fewer hours of sunlight each day.

Many people believe that Earth is closer to the sun in the summer and that is why it is hotter. And, likewise, they think Earth is farthest from the sun in the winter. But this is not true, at least, not for us in the Northern Hemisphere.

In reality, the Earth's orbit is not a perfect circle, it is a bit lop-sided. During part of the year, Earth is closer to the sun than at other times. The earth is actually closest to the sun in January, which is when countries in the Southern Hemisphere have their summer. However, in the Northern Hemisphere, we are having winter when Earth is closest to the sun and summer when it is farthest away!

SUGGESTED ACTIVITIES

Dressing up for the seasons

Provide a dressing up box with clothes suited to the different seasons. Include props such as empty sun-cream bottle, sunglasses, an umbrella, or a sledge. Call out a season and children can race to the box and choose items to put on, giving reasons for their choices.

Seasons spinner

Using 4 paper plates, or discs of paper, children decorate each to represent a season. Fold each disc down the middle and glue the halves back to back, so that the seasons follow on from one another to reinforce the idea of the cycle.

Seasons collage

The children could work in groups or as a class to make a collage of the different seasons for display. This could then be added to and referred back to during further lessons.

Acting out the seasons

Using a globe to represent the earth and a child with a bright torch or lamp to represent the sun, send the 'Earth' orbiting around the sun, spinning it round to represent each night and day and leaning sideways, to demonstrate the tilted axis.

What are the four seasons?

Write or draw what you know about the seasons in the spaces on the sheet.

Autumn	Winter
Spring	Summer

2. What are the different types of weather?

The term '**weather**' describes the state of the atmosphere at a given time. This is different from the term '**climate**', which describes average weather conditions over a longer period of time.

Weather is caused by interactions amongst various atmospheric factors including heat energy, moisture, air pressure and wind. Temperature, humidity, precipitation (any form of water that falls from the clouds: hail, sleet, snow) and wind direction are all determined by what is happening in the **atmosphere** at a given time.

In Britain we have a temperate maritime climate which means the weather we experience is influenced by the sea, in our case the Atlantic Ocean. Our northern latitude and the Gulf Stream (a warm current in the Atlantic) also influence our weather.

SUGGESTED STARTER ACTIVITY

What is the weather like today?

Observe the weather outside. Is it cloudy? Sunny? Has it been raining?

How can we tell? Ask children to note what they wore to school today. Did they bring a coat or hat? Did they wear boots or bring an umbrella?

If you have a class weather chart, invite children to come and select the correct symbols to represent that day's weather.

Safety Note

When observing the weather, pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses

TEACHER INPUT

Slide 25: When we talk about the weather, we are thinking about whether it is cloudy or sunny, dry or raining. We are also thinking about whether the air is warm or cold and whether it is windy or calm.

Slide 26: Wind is air that is moving. As the sun warms the Earth's surface, the atmosphere warms too. Some parts of the Earth receive direct rays from the sun all year and are always warm. Other places receive indirect rays, so the climate is colder. Warm air, which weighs less than cold air, rises. Then cool air moves in and replaces the rising warm air. This movement of air is what makes the wind blow.

Slides 27 - 28 It can be windy when it is sunny and when it is raining. A warm, windy day is useful for drying washing or flying a kite. People might have a wind vane to show which way the wind is blowing. Wind blowing from a cooler part of the world will be colder. Wind blowing from a hot place will be warmer.

Slides 29 - 31: Rain comes from the clouds. **Clouds** are made of tiny droplets of water that float in the air. Dark clouds are carrying more water. Clouds can carry water from place to place. When the rain falls from the clouds, it makes the ground wet and forms puddles. This is good for plants, which need water to grow.

Slides 32 -34: When it is very cold, the water droplets in the clouds can freeze. This forms crystals of ice, which are called snowflakes. Sometimes the flakes are quite wet, which is known as sleet . Sleet doesn't settle on the ground. Sometimes, snow does settle on the ground in thick layers and we can play in it.

Slide 35: The sun is a burning ball of gas called a star. Our sun provides the heat and light energy that all living things on Earth need to survive.

Sides 36- 37: A sunny day is when the sun's rays are not blocked by clouds. When the sun shines directly on us, the air is warmer. The sun's rays can burn and looking at the sun can damage our eyes.

Slides 38 - 40: There are different types of **fog**, which form under different conditions, but are all, essentially when a cloud forms at ground level. The droplets of water in the air make it hard to see. It's a foggy day if the cloud means you can see less than 1000 metres ahead.

Slide 41: A **rainbow** is a multi-coloured arc that forms in the sky. Rainbows are created by the bending of light in water droplets in the atmosphere when sunlight shines through rain. This results in a spectrum of light appearing. A rainbow is actually a full circle of light. However, due to most people viewing a rainbow on the ground we only see a semi-circle or arc of the rainbow.

Slides 42 - 43: When we have very extreme wind or rain, we call this a **storm**. Thunderstorms develop when the atmosphere is unstable. This is when warm air exists underneath much colder air. If the warm air rises very quickly, the circulating air causes electrical discharges which we see as **lightning**. The rapid expansion and heating of air caused by lightning, creates the loud clap of **thunder** as hot air moves into cooler air, creating a vibrating wave.

SUGGESTED ACTIVITIES







Class weather tracker

Take time each day during this sequence of lessons to go outside and note down the weather. Try to do this at the same time of day. Keep a record of your findings over at least a week, making a chart of your findings. It is especially useful to carry this activity out in each of the different seasons, noting any differences between them. Findings can be saved, so that children can look back to find out what the weather was like in previous years, on the same date.

Weather activities chart

Using the sheet provided (below), children complete the sections with drawing or notes, to show what they might wear or do during different types of weather.

Weather activities grid

Weather	What I can wear	What activities I can do	What to be careful of
 rain			
 sunshine			
 fog			
 snow			
 storm			
 wind			

3. How can we measure the weather?

SUGGESTED STARTER ACTIVITY

Making a simple rain gauge

You will need:

A recycled 2 litre plastic bottle for each group of children.

Scissors

A ruler

Modelling clay

Masking or gaffer tape

A permanent marker

Measuring cylinders

1. Support each group to cut a section approximately 15cm from the top of their plastic bottle, being careful as the edges of the plastic can be sharp.



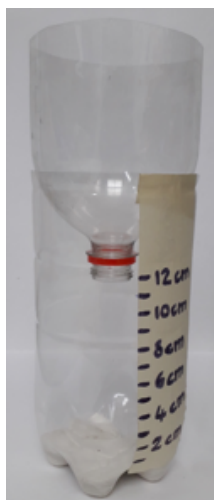
2. Use modelling clay to fill in the indentations in the bottom of the bottle, to give some stability and also to make the measurements more accurate.



3. Invert the top of the bottle inside the bottom, to create a funnel.
You may want to tape or clip this in place with paper clips.



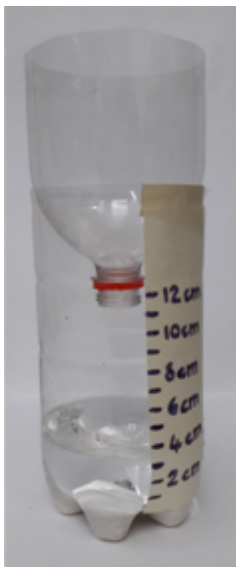
4. Cut a piece of tape to the length of the bottle.
5. Using the ruler, mark off a scale along the tape. (You may want to invite suggestions for these intervals. As the bottom of the bottle is unlikely to be even modelling clay will take up varying amounts of space in the bottles, the measurements made in this way are likely to be inaccurate and more a point for observation and discussion)
6. Stick the length of tape from the rim to the bottom of the remaining bottle, with the lowest number at the foot of the bottle. Ask the children why it is important that the tape is stuck on the right way round.



7. Place the bottle outside, somewhere where it will not be disturbed.



8. At the end of each day, or week, either use the scale along the side of the bottle to take a reading, or pour the resulting water into a measuring cylinder and record your results. These can then be mapped onto a graph (see below), or you could use linking cubes to build towers matching the amounts of rainfall.



TEACHER INPUT

Slide 44: There are lots of different tools that people can use to measure the weather.

Slide 45: Scientists who study the weather are called **meteorologists**.

Slide 46: They use special tools such as the ones at this **weather station**, to measure different types of weather.

Slide 47: A **wind vane** shows which way the wind is blowing and is often positioned on the highest point of a building. Traditionally, a cockerel is used on a wind vane with arrows pointing north, south, east and west. If the wind is blowing from the south east, we call this a 'south easterly' wind.

Slide 48: A **rain gauge** is a simple tool that collects rainfall over a set period of time. Early records show that the Ancient Greeks recorded rainfall as early as 500 BC.

Slide 49: A **thermometer** helps us to measure **temperature**, which is a word for how hot or cold something is. [It can be helpful to allow children to feel the difference between two cups of water: one warm, and one iced. Which is warm? Which is cooler? The temperature could also be checked with a thermometer]. A thermometer works by using a substance that expands as temperature increases. In the past thermometers often contained mercury; however, for safety reasons, alcohol with red dye is usually used instead.

Slide 50: Scientists study the weather and use computers to make forecasts. **Weather forecasts** help people to be prepared for different kinds of weather. Ask children what they think a weather forecast tells us. Discuss their ideas and highlight the link between the word *forecast* and the word *before*. A forecast tells us what the weather might be like in the future.

Slide 51: Satellites help scientists to gather information about the weather, by monitoring cloud formations.

Slides 52 - 54: Pictures, or 'symbols' of different types of weather are used to help show what the weather will be like. What do you think these weather symbols represent?

SUGGESTED ACTIVITIES

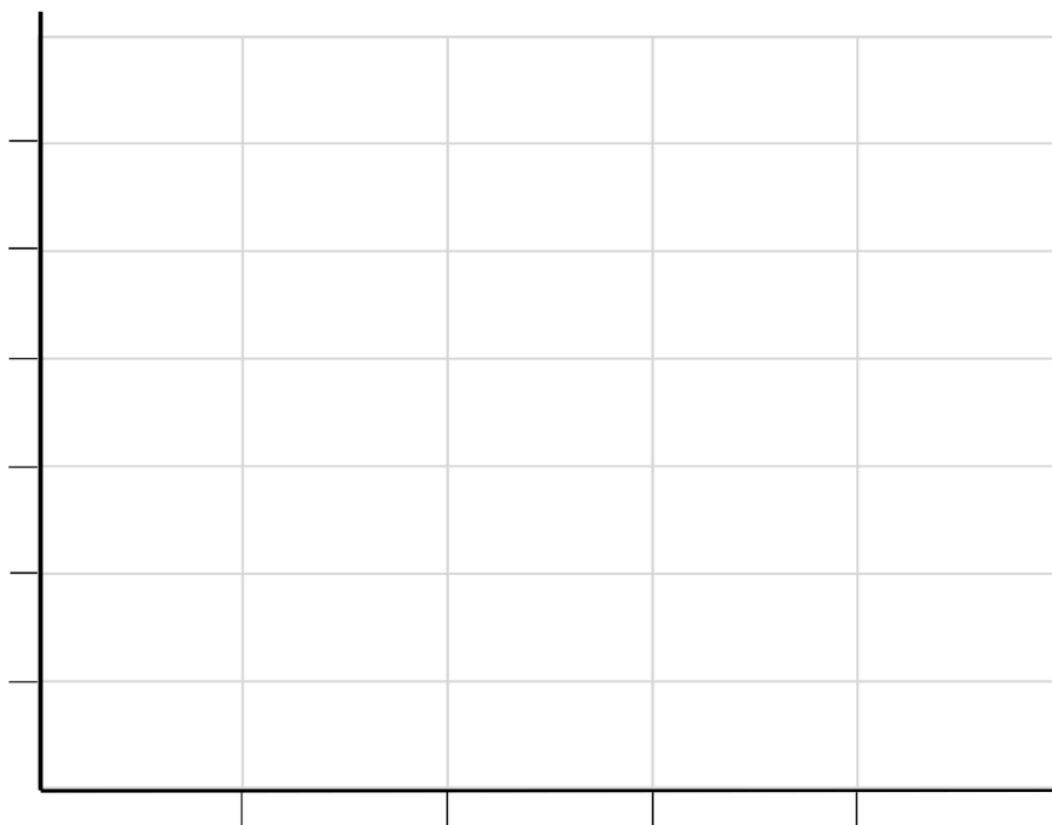
Weather forecast videos

Watch a weather forecast and ask children to look for the symbols used. Discuss the weather symbols that are needed for a forecast, perhaps linked to their own weather observations. Using the symbols from the slides, children practise making up their own weather forecasts, which could be filmed for the rest of the class to watch.

Measuring the weather

Use the children's rain gauges from the starter activity and thermometers to keep recordings of the weather over a period of time. The resulting information is then perfect for use in maths lessons on data handling.

This is a graph to show _____



day	rainfall
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

When is the weather dangerous?

SUGGESTED STARTER ACTIVITY

Ask children what the worst weather they have ever experienced is. What happened? Did they have to take any steps to protect their home? Some children may have experienced flooding or wind damage. Have the children ever heard of serious weather events from around the world? What happened?

You may want to show footage from recent weather events in the news. Find these locations on a map or globe.

TEACHER INPUT

Slide 55: Extreme weather can sometimes be very dangerous. It is especially useful to be able to predict very extreme weather, so that people can take steps to protect themselves and their homes. Some areas of the world experience extreme weather conditions due to their position. In the UK, we do see some forms of dangerous weather, but others affect us less than other places in the world.

Slide 56: Very heavy rainfall can cause a **flood**, when water is unable to drain away from the ground's surface quickly. Flooding is worse near rivers where the water level rises quickly, or near the coast when there is a bad storm, a tornado or a hurricane. Flooding can damage homes and businesses and can leave people and animals stranded.

Slide 57: A **blizzard** is categorised as a snowstorm lasting at least 3 hours, where the blowing snow causes visibility of a quarter of a mile or less. Blizzards can cause power outages, dangerous driving conditions and very deep snowdrifts.

Slide 58: A prolonged period with unusually low rain fall can cause a **drought**. This is worsened by extremely hot weather, which causes any water vapour to evaporate quickly. Plants need water to grow and animals need it to drink, so a long period of drought is a serious natural disaster.

Slide 59: A **hurricane** begins as a type of storm called a tropical cyclone that starts over tropical water. It spins round faster and faster, becoming a hurricane once it reaches speeds of 74 miles per hour. A category 5

hurricane has sustained winds of over 156 mph. Hurricanes travel across the sea and can move inland, with very fast gusts of winds that can destroy buildings, lift vehicles and cause serious flooding. Hurricanes are given names to help people know which storms are being talked about and to make them easier to remember. This helps when weather forecasters are giving weather warnings.

SUGGESTED ACTIVITIES

Emergency weather kit

Discuss with children what might be useful items to pack in an emergency kit ahead of extreme weather. Would this be different for different types of weather? Children could design different emergency kits for people to use in different situations.

Safer home design

People who live in areas at risk of hurricanes often have safety features built into their homes. For example, they may use plastic in their windows instead of glass, they may have special straps or clips to help secure their roof, or they may have hurricane shutters to cover doors and windows. Children could design their own safety features for people whose homes are at risk of different types of extreme weather.

We value your feedback!

Let us know what you thought of this lesson plan by completing this feedback form <https://e.mail-2schools.org.uk/form/BPE-Lesson-Plan>.
Thank you!