

St Peter's CE Primary School Air Topic Overview

Unit Overview:

This topic focuses on the National Curriculum requirement to understand geographical similarities and differences through the study of a region of the United Kingdom and a region of North America. It will link to the Fire and Air unit by revisiting learning about climate zones and weather patterns. This topic will also focus on the distribution of natural resources, by exploring how we harness the power of the wind to make renewable energy.

In Autumn term, pupils will develop their locational knowledge, identifying the position and significance of longitude, latitude, the Equator, Arctic and Antarctic Circle, and the Tropics of Cancer and Capricorn, and linking this to the position of climate zones. Building on prior learning about the UK, pupils will consider seasonal and daily weather patterns, considering how air can be both positive and negative. They will learn about renewable energy in the UK, with a particular focus on wind farms. Then they will learn about how tornadoes are formed.

In Spring term, pupils will use maps, globes, digital mapping, and other sources to learn about the location of the countries of North America then focus on the USA, discovering the most significant human and physical features, then comparing this to the UK. They will then focus on Hurricane Alley, to learn about its location, how the prevalence of tornadoes affects the community and how they prepare for tornadoes.

In Summer terms, pupils will complete a fieldwork unit, exploring how humans harness the power of the wind, completing an in-depth study of the effect wind farms have on communities, and options available to reduce the negative impact which will enable them to learn fieldwork skills on conducting surveys/ questionnaires.

Key Questions:

- 1. Why does weather vary?
- 2. What is renewable energy?
- 3. How are tornadoes formed?
- 4. How do people learn to live with the power of the wind?
- 5. What are the physical and human features of the USA? (Case study)
- 6. Would you like to live near a wind turbine? (Fieldwork)

Objectives covered in this unit:				
Geography	• I can locate places on a map.			
	 I understand about different places 			
	 I can compare different places around the World. 			
(see	 I can ask geographical questions. 			
progression	• I can answer geographical questions.			
in	• I can use a wide range of geographical words in my work.			
expectations	• I can share my geographical knowledge effectively.			
document)	• I can use a wide range of geographical and fieldwork skills - field sketching,			
	measuring, direction, using/drawing maps, scale and distance, photography,			
	recording, questionnaires.			



	Geography definitions				
	Geography - Geography is the study of places and the relationships between people and the natural environment. Geographers explore both the physical properties of Earth's surface and the human societies spread across it.				
	Human geographers study the relationship different people have with the Earth. This includes where they live, what they do and how they use the Earth's resources, as well as understanding the culture and customs of different communities.				
	Physical geographers observe, measure, and describe Earth's surface, climate, and processes. They study how landforms develop and how the Earth is changing.				
Why does	Weather and climate				
weather vary?	Pupils need to understand that there are different weather patterns in different parts of the world and that these climate zones vary at different times of the year.				
	The difference between weather and climate is time. Weather is the short-term, day to day conditions of an area. Climate is the long-term conditions of an area recorded over a longer period of time.				
	<u>Climate zones</u>				
	Generally, the world is divided into five climate zones. Cross referencing the average precipitation and air temperature in different parts of the world, (with mention of seasonal variations), enables you to map the different climate zones. Take care not to confuse climate zones with biomes (which describe the flora and fauna living in a specific area, linked to climate)				
	Image: descent state				
	The climate zones are as follows,				
	• polar climate zone (very cold) - including polar deserts and arctic tundra				

 temperate climate zone (neither very hot nor very cold) - including temperate deciduous and coniferous forest 			
 sub-tropical zone (hot with wet and dry seasons) – including savannah, chaparral and temperate grassland 			
 equatorial or tropical climate zone (very hot, wet) - including tropical rainforest 			
 desert climate zone (very hot, dry) - including hot desert 			
Additional resources for weather and climate around the world <u>Royal</u> <u>Geographical Society - Resources for schools (rgs.org)</u>			
Weather and climate in the UK			
However, pupils should focus of the climate of the UK and specifically how wind affects this. Although the UK is in in a temperate climate zone, weather and climate vary around the UK, due to:			
 proximity to the sea 			
 altitude - higher altitude areas are colder due to lower air pressure. 			
 currents - the UK has a warm climate due to the Gulf Stream - a current of warm water that travels north-east from the Gulf of Mexico, over the Atlantic Ocean, bringing warmer water towards the UK. 			
 winds - these pass heat energy from one area to another. Winds that come from the north, such as polar or Arctic air masses, bring cold, wet weather, such as snow to the UK. If the wind comes from the south, tropical air masses bring warmer, drier weather (see map below) 			
Old winters, stady rain Wild winters, col summers, stady rain NW SE Swarm summers, dry Mild winters, warm summers, dry Mild winters, in Mild winters, in Swarm summers, dry			
KS2 Geography: Weather - BBC Teach			
<u>Weather and climate in the UK KS2 Geography Year 3 and Year 4 - BBC</u> <u>Bitesize</u>			

This unit should not include the water cycle, this is taught in the Water unit.

	What is renewable energy?	Renewables are made from natural resources on our planet, like wind, water, and sunlight. Also known as "clean energy" as they do not pollute the environment. There are five main sources of renewable energy in the world;
		Solar Energy - energy produced directly from sunlight through smart solar panels placed outside of buildings facing the sun. Solar can be used to heat up buildings, water, and be turned into electricity.
		Wind Energy - the blades of large windmills are moved by the power of the wind. These blades spin a turbine inside a generator to produce electricity. There are over 341,000 wind turbines on the planet spread across 83 countries.
		Hydroelectric Power - water from dams and rivers can be used to spin powerful turbines and generate what we call hydroelectricity. Several provinces in Canada produce over 90% of their energy through hydropower and the country is one of the largest global consumers of this energy source along with China and Brazil.
		Geothermal Energy - huge pumps extract the heat and steam from below the Earth - mainly from volcanoes and geysers - and use these to heat up homes and buildings as well as to generate electricity. About 25% of the total electricity of Iceland is produced by geothermal energy, thanks to the country's several hot springs.
		Biomass Energy - this is the oldest source of renewable energy on the planet. With biomass, we refer to all organic matter that has stored energy through the process of photosynthesis. For example, wood, crops, seaweed, and animal waste. This energy is converted to electricity and heat. In the United States, the majority of biomass energy comes from wood.
		Learning about renewable energy should be linked back to the UK (considering which renewable energy could be produced here) and specifically to wind power.
		Wind power (mainly for use in Summer term unit)
		Wind is air in motion. Air moves from areas of higher pressure to lower pressure. However, winds are also influenced by air temperature. The Sun warms air more in some areas than others, causing it to move. Warm air rises up into the atmosphere this leaves room for cool air to flow in. The warm air cools in the atmosphere and is drawn closer to Earth again.
Sco Lev Bite		Scotland - Geography - Weather - Wind - P2, P3, P4 P5, P6, P7 - First and Second Level classroom and home learning for Curriculum for Excellence with BBC Bitesize Scotland - BBC Bitesize
		Winds are named after the direction from which they come, not the direction toward which they blow. For example, wind blowing from west to east is called a westerly. Wind is measured using a device called an anemometer, the speed can be measured in miles per hour/ kilometres per hour or knots, and is then ranked on the Beaufort scale, where 0 is calm (smoke rises vertically) to 12 is hurricane (devastation, air filled with foam and spray).
		Winds greatly affect the weather. They bring cool air into warm areas. They also can bring rain, snow, or even dust and sand. For example, in southern Asia winds known as monsoons bring rain during the summer. This happens because cool, moist air from over the ocean moves in over the warm land.

	Wind power harnesses kinetic energy (the energy of movement) to make						
	electricity.						
	I he wind moves the blades on a shaft gearbox						
	turbine, using the kinetic						
	energy of the wind.						
	• A shaft running from the bladas to a pagebox (nasallo)						
	blades to a gearbox (nacelle)						
	• The genrs use the slow-spin of						
	this shaft to make a second						
	shaft spin much faster.						
	This spins magnets inside a						
	generator.						
	• The magnets spin very fast past coils of copper wire making electricity start to						
	flow through the wire. Kinetic energy is changed to electrical energy.						
How are							
tornadoes							
formed?							
	2						
	1 Tonnadaes begin when the sun heats the sunface of the land As the worm less						
	heavy air begins to rise it meets the colder heavier air above it. Note that						
	neavy air begins to rise, it meets the colder, heavier air above it. Note that wind shears make it even easier to set them off. Wind shear is when two winds						
	at different levels and speeds above the around blow together in a location.						
	2 The fasten-moving air begins to spin and roll over the glower wind Ag it rolls on						
	2. The faster-moving air begins to spin and roll over the slower wind. As it rolls on, it aathers pace and arows in size						
	n gumens pace and grows in size.						
	3. At this stage, it is an invisible, horizontal wind spinning and rolling like a						
	air forces the spinning winds vertically upward causing an updraft						
	an forces the spinning whas ver nearly upward, causing an upara tr.						
	4						
	5						
	6						
	4. With more warm air rising, the spinning air encounters more updraft. The winds						
	spin taster, vertically upwards, and gains more momentum.						
	5. At this stage, the spinning winds create a vortex and the wind has enough						
	energy to fuel itself.						

	6. The tornado is fully formed now and moving in the direction of the thunderstorm winds. When the pointed part of the tornado touched the groun from the cloud, it is often referred to as 'touch down'. As it moves it rips off things along its patch.				
	Royal Geographical Society - Resources for schools (rgs.org)				
	Royal Geographical Society - Resources for schools (rgs.org) - there is a good video on here to explain how tornadoes form.				
How do people	<u>Wind farms</u>				
learn to live with the power of the wind?	Some locations are better for the location of wind farms. Exposed flat areas are better as they produce a strong, steady movement of air. Onshore wind farms tend to be located in hilly areas, or offshore wind farms in less sheltered areas. Wind power has advantages and disadvantages to be consider, including aesthetics, environmental impact, cost effectiveness, and impact on wildlife.				
	KS2 Geography: Coasts and energy - BBC Teach				
	Living with tornadoes				
	Tornado Valley – Located in North America, it incorporates the US states of Oklahoma, Kansas, Nebraska, Missouri, Iowa, South Dakota, and North Dakota States such as Minnesota, Wisconsin, Illinois, Indiana, and Ohio. There are around 268 tornadoes each year in Tornado Valley.				
	On average 60 people die every year because of tornadoes, but in 2011 540 people died.				
	There is a tornado season from March - June, but they can occur at any time.				
	Tornadoes are measured on a Fujita scale, from 0-5				
	There is lots of useful information, videos and maps here <u>Tornadoes</u> - <u>GEOGRAPHY FOR 2023 & BEYOND (geographypods.com)</u>				
What are the	North America				
physical and human features of the USA? (Case study)	There are 23 countries in North America. It is the third largest continent by area and fourth largest by population. The biggest country is Canada which is close to 10 million square kilometres in size - the UK could fit inside it 40 times!				
(cuse study)	The USA				
	The USA (some useful resources for physical and human features of USA here - <u>Royal Geographical Society - Resources for schools (rgs.org)</u>)				
	There are 50 states divided into four regions (similar to our counties and regions); the West, Midwest, Northeast and South. Each state has its own state capital and government (under a governor), with freedom to set its own laws about some matters, but federal laws are set by national government in the country capital (Washington DC - not Washington!). Two states, Alaska and Hawaii, are separate				





Air Vocabulary

Vocabulary				
	renewable	Weather and	Usa	fieldwork
		climate and		
		tornados		
Tier 1	Fossil fuel	Climate	State	Wind farm
	Renewable	Biome	Government	Survey
		Deciduous	Industry	Location
		Tornado	Tourism	
		Thunderstorm	Population	
		Cylinder		
Tier 2	Biomass	Equator	Export	Onshore
	Solar power	Tropic of Cancer	Imports	Offshore
	Wind power	Tropic of	Economy	Turbine
	Geothermal	Capricorn	Rural	Generator
	Hydroelectric		Urban	
Tier 3	Renewable energy	Anemometer	National	
	Turbine	Weather vane	Fujita scale	
	Atmosphere	Updraft	Kinetic energy	
		Hurricane		