

Year 7 GEOGRAPHY

WEATHER & CLIMATE

Independent Study Booklet

You can either type on the document, print it out, or write on separate paper.



Name: _____ Form: _____

Section 1 – The difference between weather and climate

Use BBC Bitesize for KS3: <https://www.bbc.co.uk/bitesize/guides/zw9qtfr/revision/1>

1. Read about the difference between weather and climate.

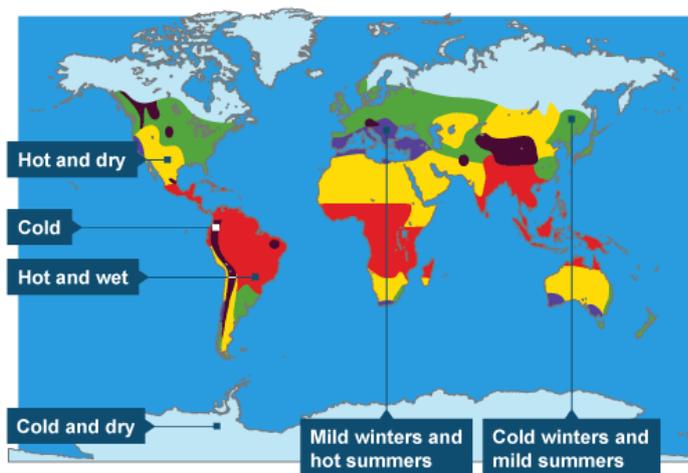
Task 1: Weather or Climate?

-----	The day to day condition of the air around us (the atmosphere).
-----	What the weather is usually like at a place or at a particular time of year.

Task 2: Tick whether these statements are about the weather or about climate?

Statement	Weather?	Climate?
Yesterday it rained all day long and was quite windy.		
June, July and August are usually the warmest months of the year in the UK.		
The rainforest is a tropical environment, where rain is expected every single day.		
January is always a good time to head to Florida to catch some winter sunshine.		
Last Tuesday it was very foggy on the motorway.		
Tomorrow it will be cold and frosty in the morning.		
In Spain it is usually very hot in the summer months.		

2. Study the map below – use the internet to name a **country or place** which has one of the climate zones listed.



Key	
 Polar	 Tropical
 Temperate	 Mediterranean
 Arid	 Mountains

1. Polar: _____
2. Temperate: _____
3. Arid (Hot desert): _____
4. Tropical (rainforest): _____
5. Mediterranean: _____
6. Mountains: _____

Section 2 - Measuring the weather

1. Read the information on BBC Bitesize about Measuring the weather:
<https://www.bbc.co.uk/bitesize/guides/zw9qtfr/revision/2>
2. What is the name for someone who **measures** weather conditions in different places and uses this information to **report** and **make forecasts** about **future weather** conditions? _____

Observing and Recording the Weather

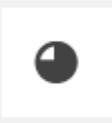
<u>Weather Term</u>	<u>Means</u>	<u>Usually given in</u> (what units are used)	<u>Measured using</u> (what equipment?)
	Exactly how hot or cold it is		
	How strong the wind is (how fast)	The _____ gives us an estimate (rated 0-12), but we can use 'mph' or 'kph' accurately.	Anemometer (for accuracy) <u>or</u> Beaufort Scale (for estimate of force)
	The amount of sky covered by cloud		Oktas , which we estimate using our eyes
	Describing the weather in words	Words like rainy, snowy, showery, foggy, misty, fair, sunny etc	We don't measure this!
	The distance that can be seen	Measured in _____	Our _____ (how far we see, or don't see if it is foggy or misty!)
	The direction the wind blows from		A weather vane (or _____)
	Water falling to the ground from the air as rain, sleet, hail or snow		A rain gauge
	The shape of the clouds in the sky		We look at the _____ and height

3. Task: Copy or paste in these missing words or phrases to complete the table:

Weather Terms: Cloud Type, General Weather, Precipitation, Visibility, Wind Direction, Cloud Cover, Wind Speed, Temperature

Usually given in: Names of clouds e.g. Cirrus, Eighths (which look like pie charts), Beaufort Scale, Compass Directions, Degrees Celsius, Metres, Millimetres

Measured using: Thermometer, Shape, Eyes, Wind Vane

Symbol	Cloud cover
	Clear sky
	One okta
	Two oktas
	Three oktas
	Four oktas
	Five oktas
	Six oktas
	Seven oktas
	Eight oktas
	Sky obscured

Section 3 – Weather Observation Challenge

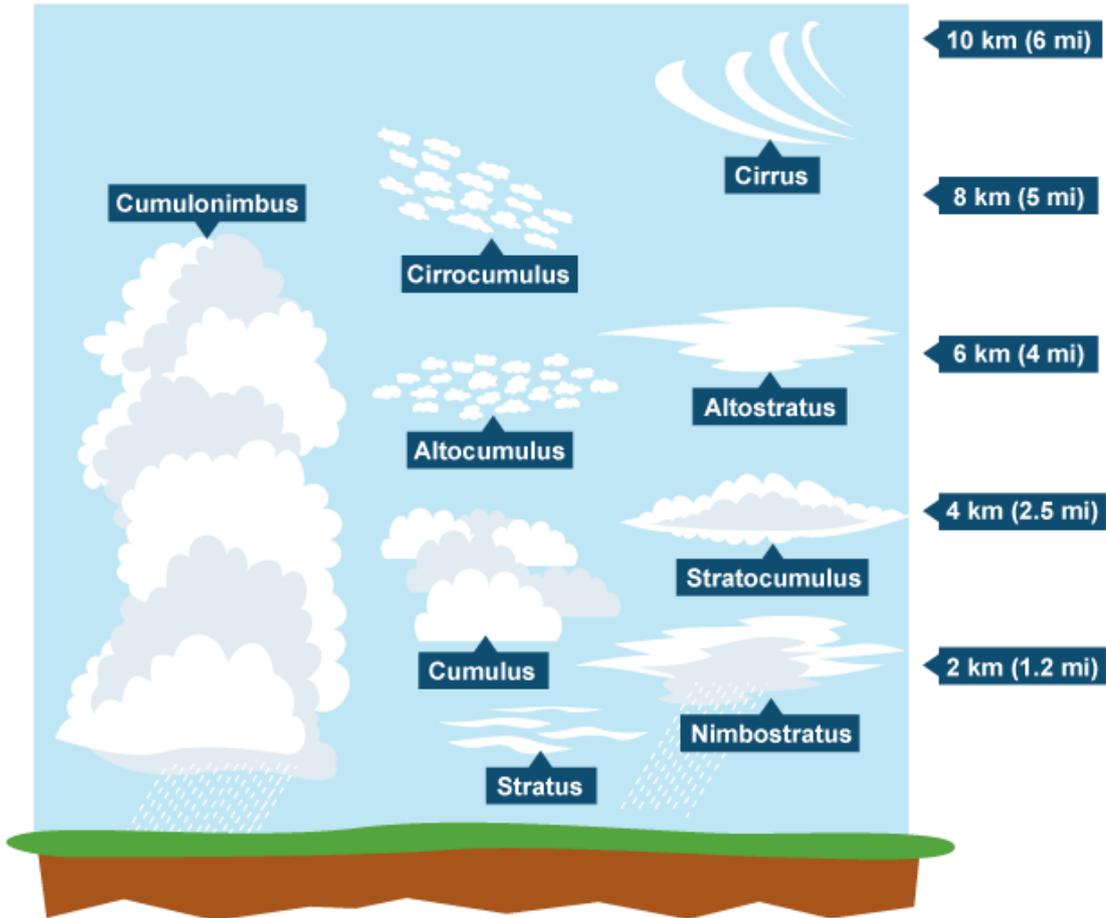
1. Read the information to the left on how cloud cover is recorded using Oktas. Oktas are when we decide how many eighths of the sky are covered by cloud when we look around. The symbols looks a little bit like pie charts (see left image)

2. Read the information below on how wind speed can be estimated using The Beaufort Scale.

The Beaufort Scale - for estimating wind speed by using observations. There are 12 'Force' levels, which indicate average wind speeds in kilometres per hour.

Beaufort Scale	Force Name	Effects	Speed (kph)
0	Calm	Smoke rises vertically	0
1	Light Air	Smoke drifts	1-5
2	Light Breeze	Wind felt on face, leaves rustle	6-11
3	Gentle Breeze	Leaves and small twigs move	12-20
4	Moderate Breeze	Small branches move	21-30
5	Fresh Breeze	Small trees sway	31-40
6	Strong Breeze	Large branches sway, umbrella used with difficulty	41-50
7	Near Gale	Whole trees sway	51-60
8	Gale	Twigs break off trees, hard to walk into wind	61-74
9	Strong Gale	Chimney pots and slates blow off	75-87
10	Storm	Trees uprooted	85-100
11	Violent Storm	Rarely occurs inland	101-115
12	Hurricane	Disastrous, widespread damage	115+

3. Read the information on cloud types (different shapes and heights have different Latin names!)



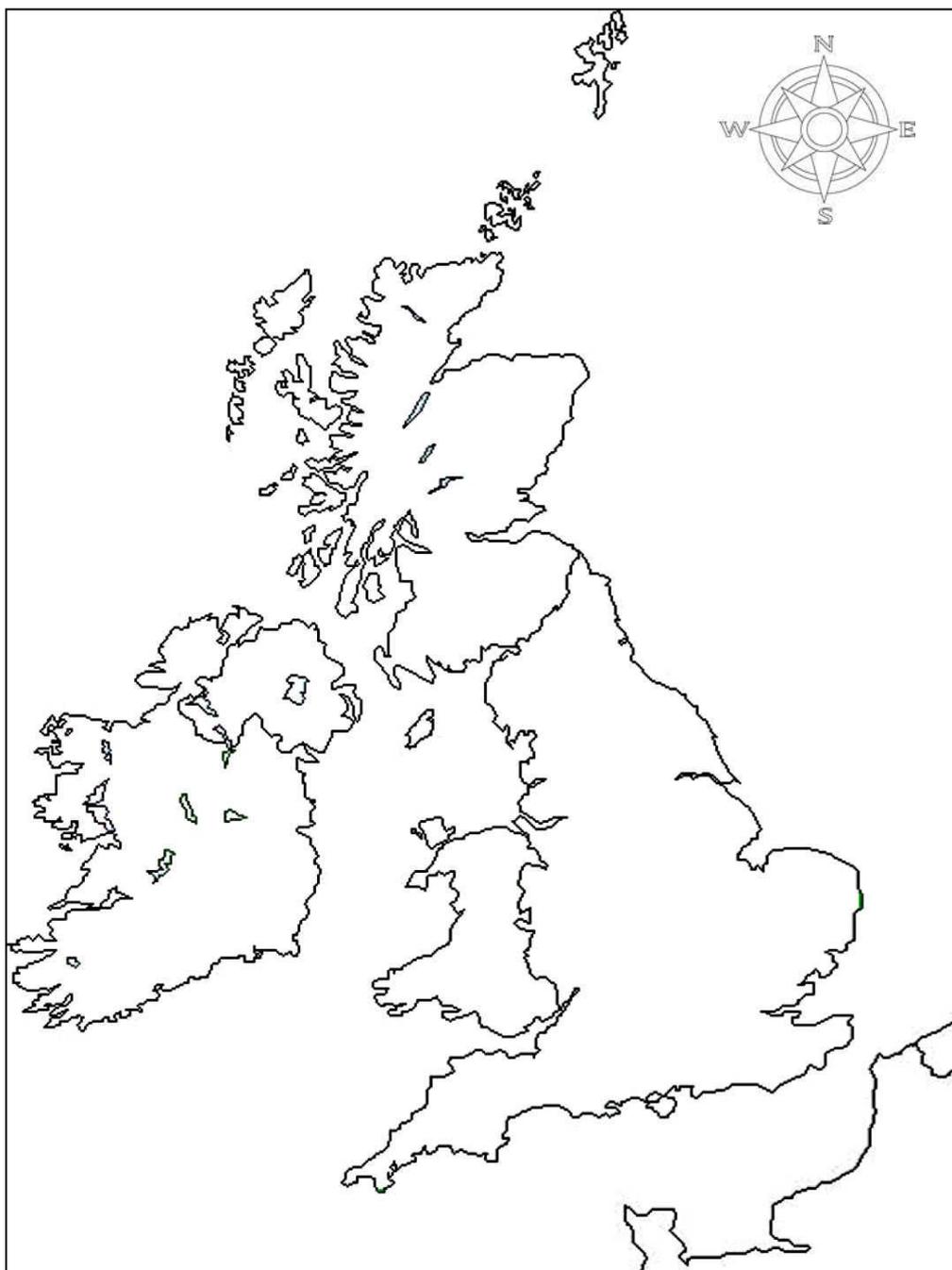
4. Which cloud types do you think you can see in these two images?



5. Challenge: For 5 days complete a weather diary in the table below:

Day, Date and Time of day	Description of today's weather in words (what does the temperature 'feel' like e.g. 'warm' and is it raining or dry?)	Cloud Cover in Oktas (use the symbol or write how many eighths are covered)	Wind speed on the Beaufort Scale (force number from 1-12)	Cloud Types observed in the sky (name them!)

Section 4 – Weather Forecast Mapping



Tasks:

1. Label the nations of the UK by writing their names onto the map in the correct locations:

Northern Ireland, England, Wales, Scotland.

2. Draw the appropriate weather symbols in the correct locations by reading this weather forecast:

“Today’s weather will be mostly cloudy in Wales and Southern England. The temperature in these locations will be 10°C. In Northern England there will be sunny spells and temperatures of 12°C. The best of the weather will be in Northern Scotland and Northern Ireland, where it will be sunny and 14°C. The winds will be South Westerly off the coast of Wales, North West England and North West Scotland”.

Useful Symbols:



Cloudy:



Sunny Spells:



Sunny:

Temperatures can be written in a circle e.g.:

13

Wind direction is the direction the wind blows from e.g. a “Westerly” wind comes from the West and blows towards the East. It can be shown as an arrow.



Section 5 – Rainfall in Britain

Rain (precipitation) happens because air is forced to rise, then it cools, water vapour then condenses and it becomes cloud and rain (or sleet/snow/hail). There are three different reasons why air rises and these are therefore the three different causes and types of rainfall we experience.

Look at <https://www.bbc.co.uk/bitesize/guides/zjk7hyc/revision/3>

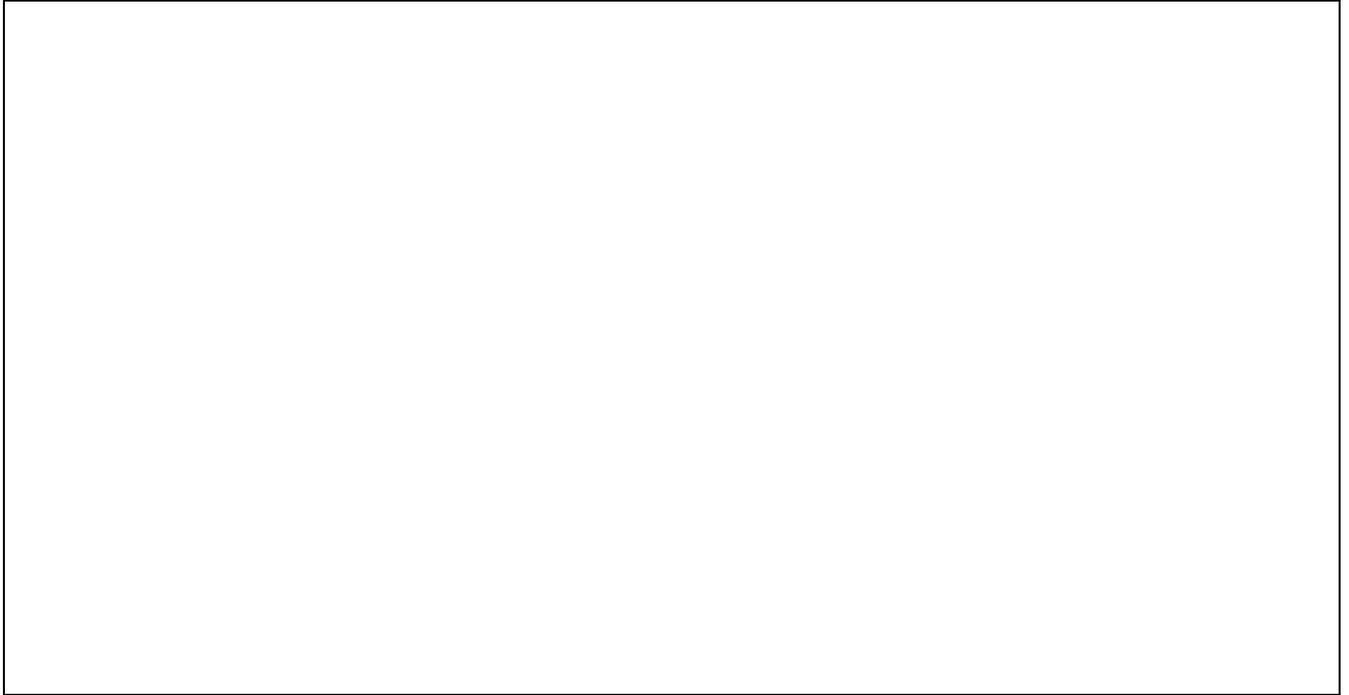
1. Relief Rainfall happens because...

Draw or paste in a picture:



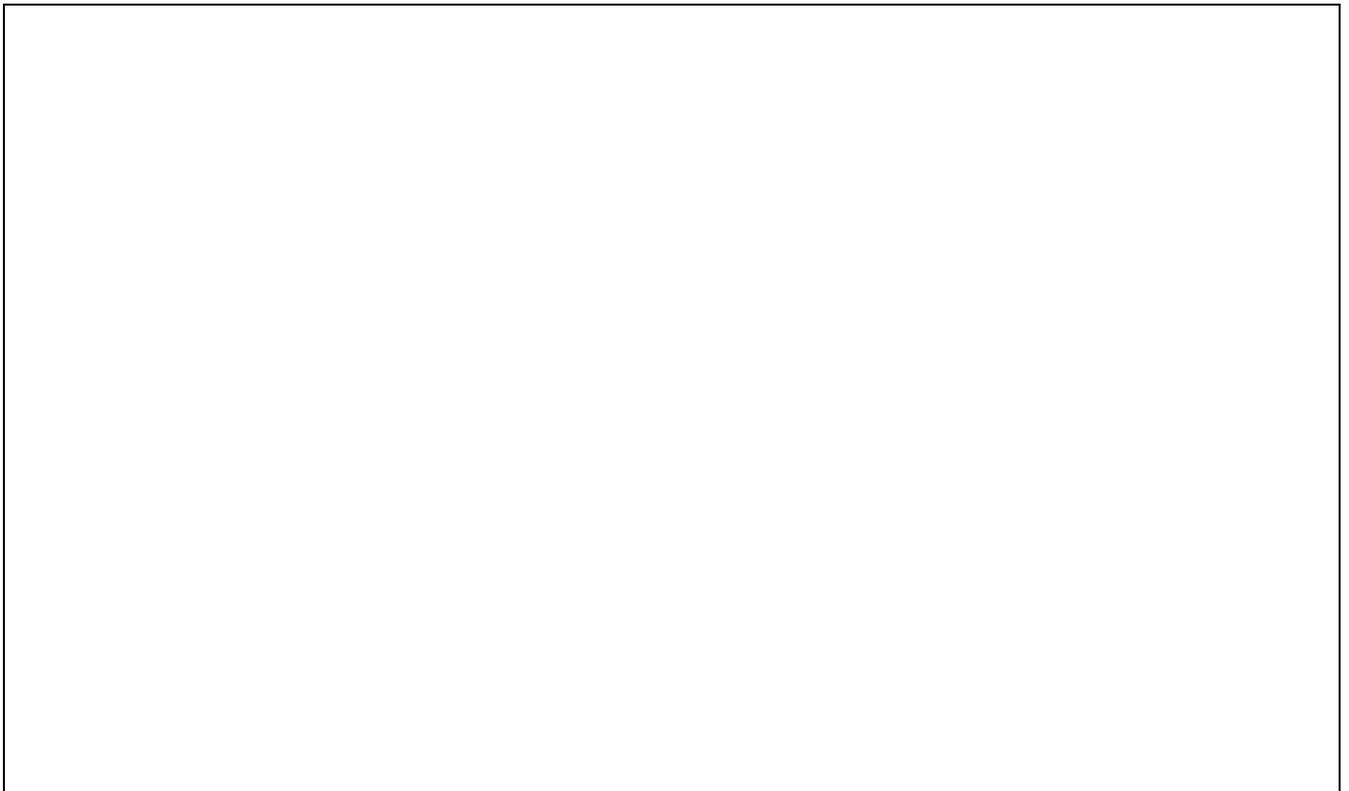
2. Frontal Rainfall happens because...

Draw or paste in a picture:



3. Convictional Rainfall happens because...

Draw or paste in a picture:



Section 6 – Wicked Weather: Tornadoes

How are tornadoes formed?

<http://www.bbc.co.uk/learningzone/clips/how-tornadoes-are-formed/13529.html>

1. What is a tornado?

2. What weather conditions cause them?

3. What types of weather happens in a tornado?

The Oklahoma Tornadoes of 2013

Tornado Alley:

<http://www.bbc.co.uk/news/world-us-canada-22612496>

How did the Oklahoma tornado form?

<https://www.bbc.co.uk/news/av/world-us-canada-22606454/how-oklahoma-tornado-was-formed>

Tornadoes Fact Sheet: 2013 Oklahoma Tornado: Research task. Use the internet to find out!

- When did it happen?

- Where was affected?

- A Picture of one of the tornadoes.

- What happened to the land?

- What happened to people?

- What has been done to rescue people / make it safer to live there in the future?

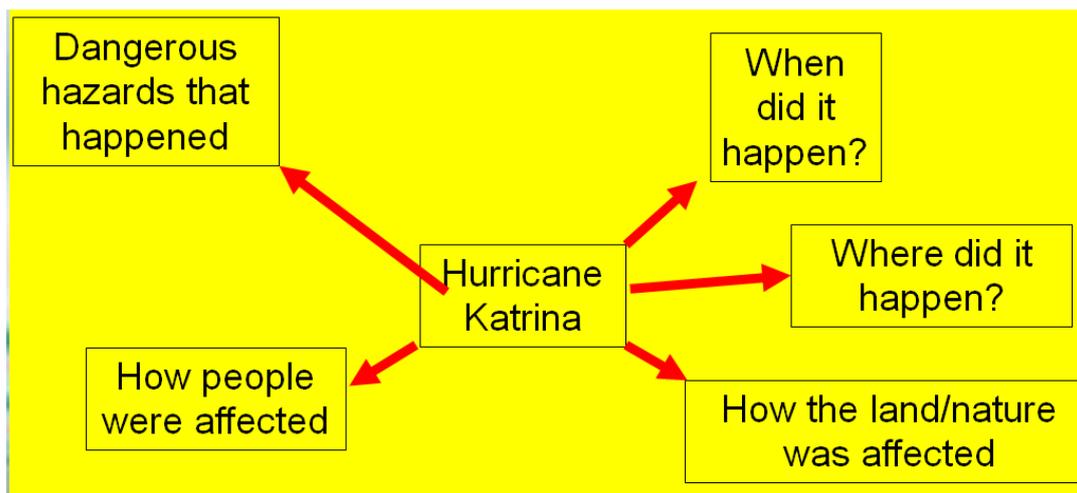
Section 7 – Wicked Weather: Hurricanes

Hurricanes are large rotating storms, centred around 'low pressure' areas – they can bring 200kph winds, heavy rainfall and high stormy waves at sea. Hurricanes form between 5° and 15° of latitude, over tropical seas with a minimum sea surface temperature of 27°C

Example: Hurricane Katrina 2006

Watch this video: <https://www.youtube.com/watch?v=WQYMku1RjqU>

Make a mind map



Section 8 – Microclimates

A **microclimate** is when the climatic conditions vary over a small distance e.g. around a school or home.

Write a sentence to describe an **outdoor place** at **School** which is **usually**:

- a) Sunny on a hot day

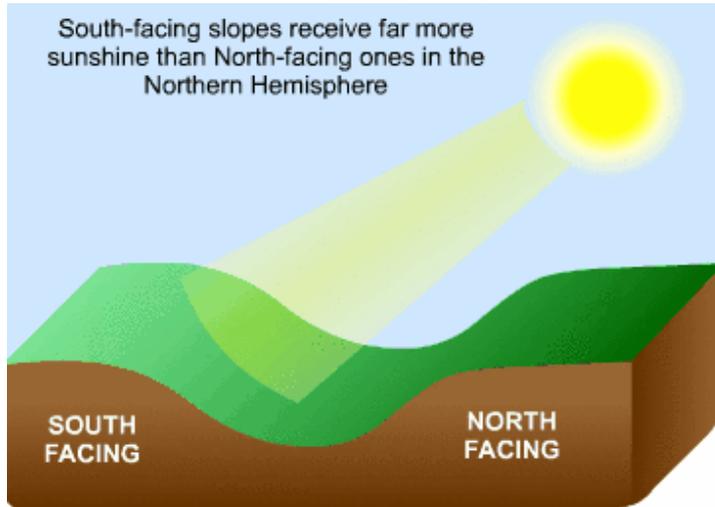
- b) Shaded on a hot day

- c) Sheltered on a windy day

Extension: Try to explain why it is like that there.

Things which affect temperature are:

1. **Aspect** – the direction a place faces – s_____ facing places warmer. E_____ facing are warm in the morning (sunrise), w_____ facing are warmer in the evening (sunset).



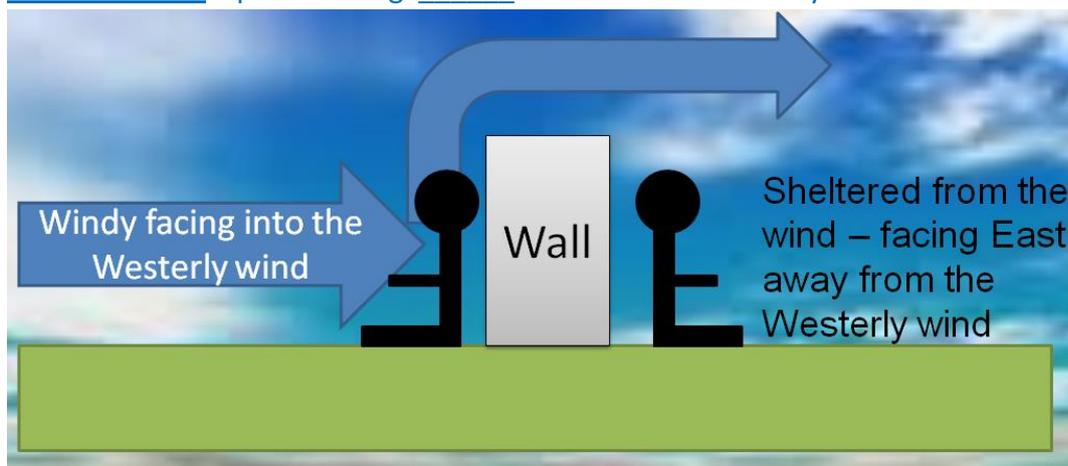
2. **Surface colour** – d_____ colours like black tarmac absorb heat more.
3. **Buildings** - can create shade and make it feel c_____ or give off heat in cities.



Buildings store heat and give it out in the afternoon. Buildings close together can break up winds. It would be warmer, especially in the afternoon

Things which affect wind speed are:

1. **Wind direction** – places facing i _____ the wind = more windy!

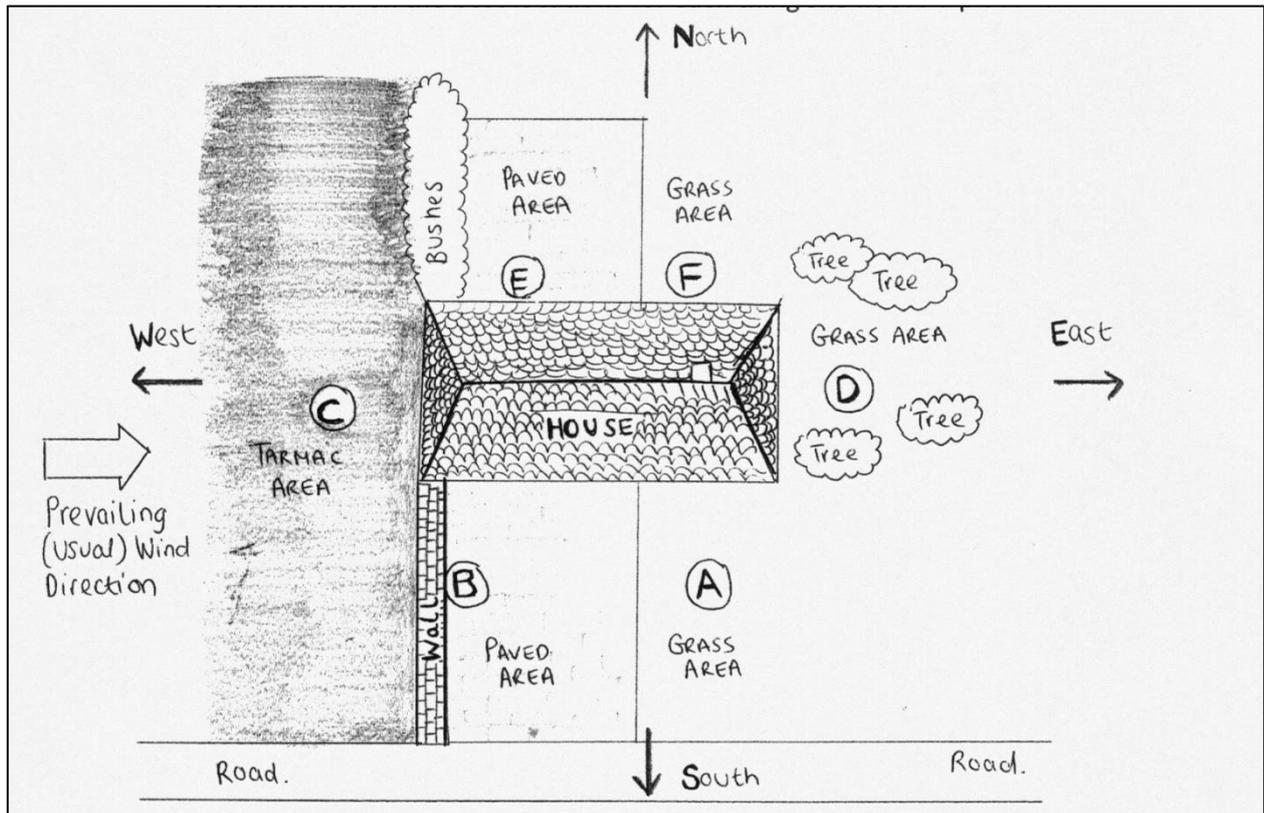


2. **Shelter** e.g. buildings – buildings may s _____ the wind from reaching a place because they block it, or they can even funnel it q _____ through gaps in the buildings, making some places windier.

Summary:

Factors affecting Wind Speed		Factors affecting Temperature	
Windy?	Calm?	Warmer?	Cooler?
On the side of a wall facing into the wind	On the side of a wall sheltered from the wind	Dark surfaces such as tarmac (absorbs heat)	Light surfaces such as grass
Near lakes .		Places in Britain which face South	Places in Britain which face North
On hilltops .		Built-up urban areas with lots of buildings with heating systems.	Rural areas with lots of open countryside and few buildings to give off heat.
		Open countryside with no trees for shade.	Trees provide shade .

Task: Microclimate of a house:



Which location (A to F) should the owner of the new house **choose** for each of these things?

Write your answer and an explanation of your reasons using the microclimate words such as aspect, surface colour, buildings / shade (from sun), wind direction and shelter (from wind).

1. Her patio furniture which she would like to sunbathe on?

2. Her washing line which needs lots of wind and sunshine to dry the clothes?

3. Her children's rabbit hutch? Flopsy gets grumpy if she is too hot!

4. Her young boy's swing? He is pale and burns easily in the sun but loves to play outside.

5. A pond? It will grow algae (which kills the fish) if it gets too much sunshine.

Section 8 – Research project on extreme weather in the UK

Task: Research one 21st century extreme weather event which affected the UK.

For example:

- Storm Desmond (UK Floods 2015)
- Storm Ciara (2020)
- UK Extreme Cold and Snowfall event (2010) or Beast from the East (2018)
- UK Heatwave/Drought 2018.

Main task: Write a newspaper article to describe the event (it can be written by hand, completed on the work sheet/booklet or made into a power point).

You must include:

- Headline for article (make it catchy!)
- Key facts e.g. dates, location(s)
- Causes - explain what made the weather event happen
- Effects (include specific facts about the damage done to people, property and the environment)
- Responses (short term and long term, include specific facts about how people coped and tried to make things better/safer)
- Can you include how it affected your own local/surrounding area?
- Pictures of the event.

Section 9 – Building a weather instrument



Make a Weather Instrument

When planning and building you need to think about;

1. Decide which element of the weather you are going to measure.

Make sure your instrument is **suitable and appropriate** to measure the element of the weather you have chosen.

2. Which resources are you going to use?

Are the materials suitable for the instrument? Do they need to be **lightweight**? **Heavy** for support? **Flexible**? Is it **strong enough** to withstand the elements? Think about what you can use in your recycling.

3. Does your instrument actually work?

Take your instrument outside and use it to measure the weather, **does it work?** Can you **make it better** if it doesn't?

