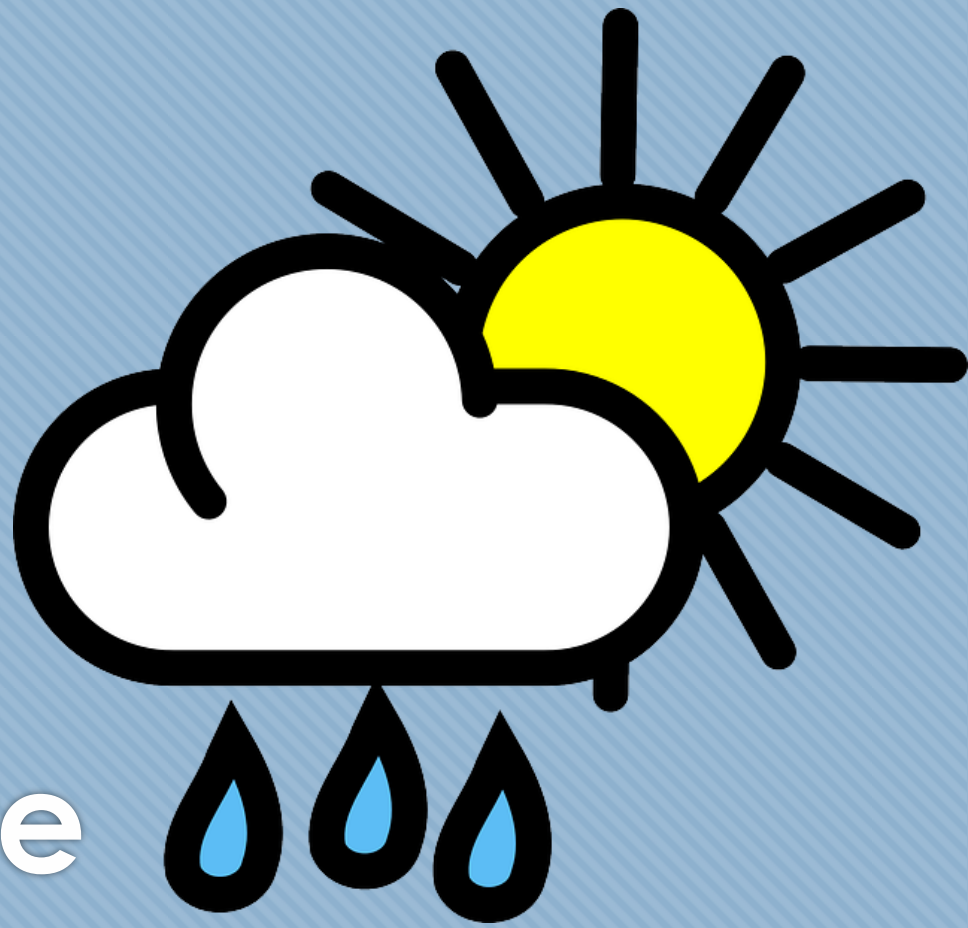
Weather and Climate



WEATHER

VS

CLIMATE

Weather *or* Climate?

temperature
mediterranean
dry
type of vegetation
rainfall
wind speed
average temperature
sunny

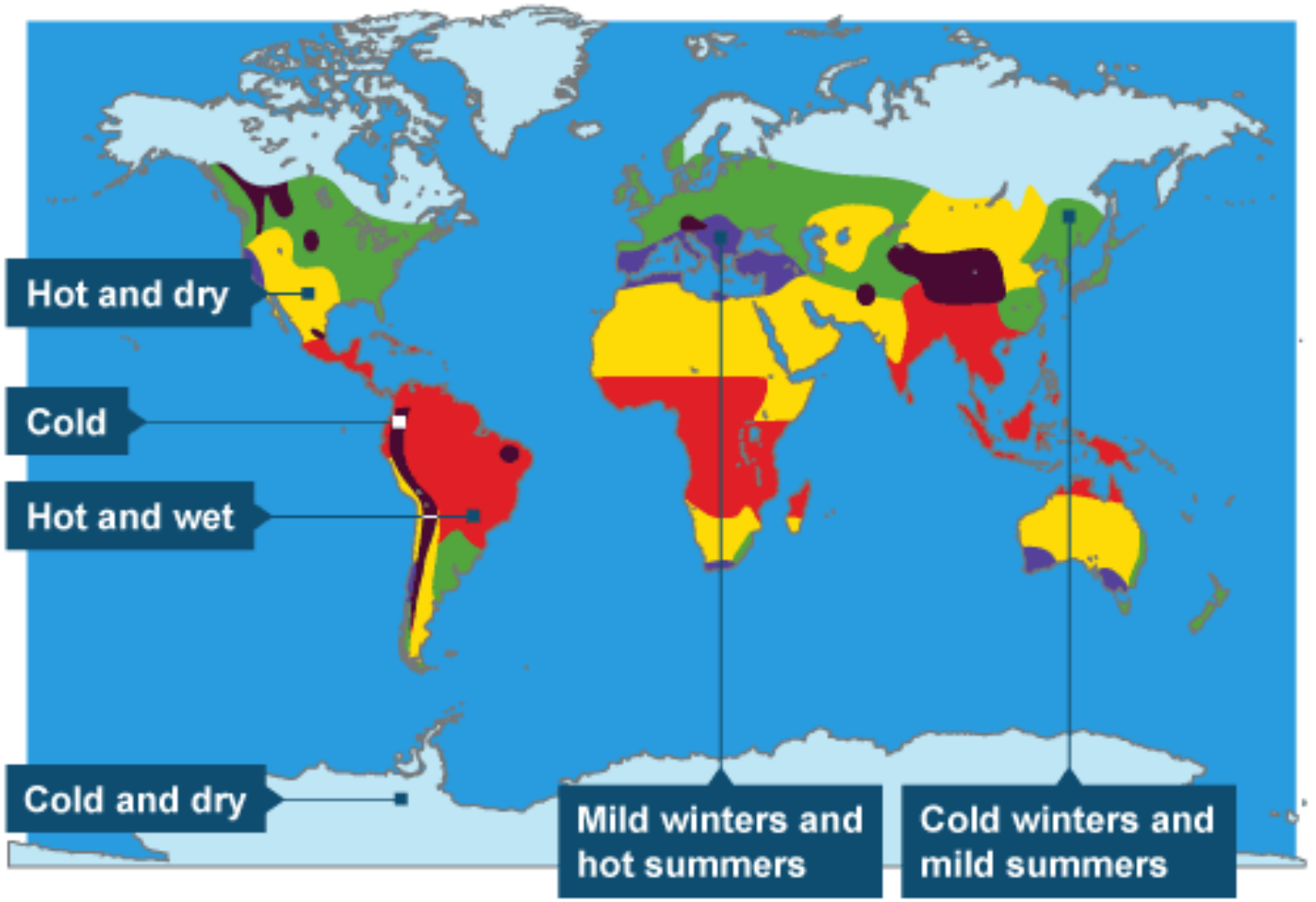
Weather VS. Climate

- **Climate** describes average weather conditions over longer periods and over large areas.Ex : Mediterranean climate (hot dry summer, cool wet winters)

- **Weather** describes the day-to-day conditions of the atmosphere. Weather can change quickly - one day it can be dry and sunny and the next day it may rain.Ex : Temperature(18^{0}C), Wind(NW), Sea(calm)

7 Day

Day	Monday 03/08/15
Weather	Sunny
Temperature Real-Feel	38-27°C 43-29°C
Sea temp	27°C
Wind	N force 3
Humidity	45-95%
Chance of Rain	0%
Chance of Thunder	0%
U.V	10



Key

- Polar
- Tropical
- Temperate
- Mediterranean
- Arid
- Mountains

Rain

Page

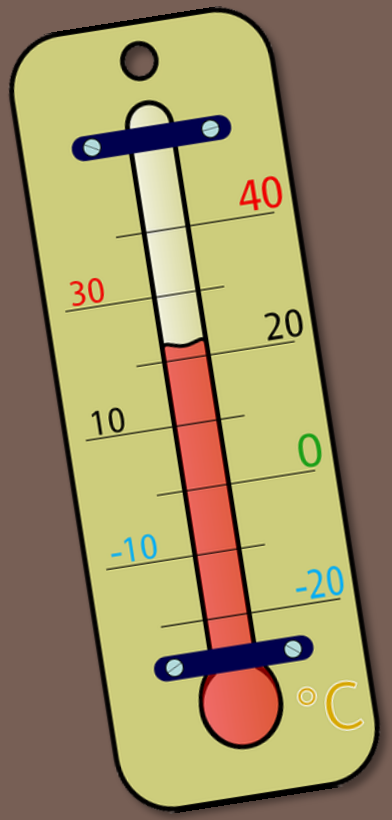
Measuring weather

Weather affects us in many ways. It affects what we do and what we wear, how we travel and even our moods. Meteorologists measure weather conditions in different places and use this information to report and make forecasts about future weather conditions. This is useful because people can be warned about hazardous weather conditions such as storms and floods.

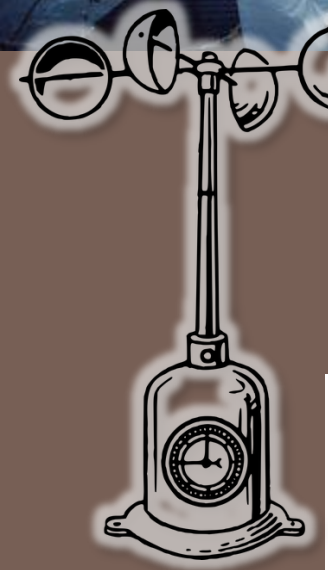
What do we measure?

- **Temperature**
- **Precipitation, eg rainfall**
- **Wind speed and direction**
- **Cloud cover and visibility**
- **Air pressure**
- **Humidity (amount of water vapour in the air)**
- **Sunshine**

- **Temperature** is measured **in degrees celsius (°C)** using a **thermometer**. The thermometer must be shaded from direct sunlight and should have air circulating around it. The thermometers can be placed in a **Stevenson Screen**. This is a wooden box with slatted sides, a sloping roof and legs to keep the screen off the ground. It is painted white to reflect the sun.



- **Precipitation** is measured using **a rain gauge**. This is a funnel inside a graduated container. The depth of the rain in **millimetres** can be read from the side of the container.



- Man uses **anemometer** to measure the **strength of the wind** at sea. **Wind direction** is reported by the direction it is blowing from, according to the **compass**. Wind blowing from the west is travelling eastwards so is called a westerly wind, not an easterly wind.

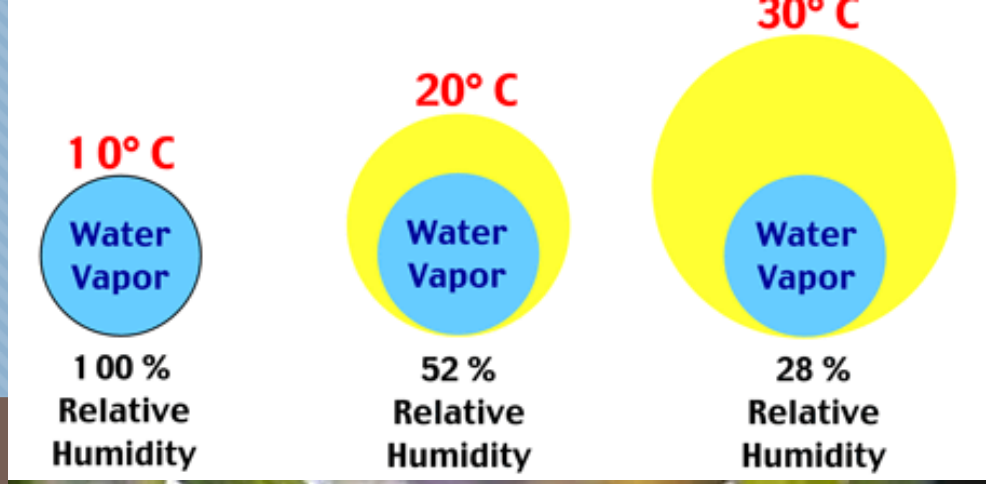
- **Wind speed** can be measured using an anemometer. The strength of the wind is measured on the Beaufort scale.

- **Cloud cover** is measured in units called **oktas**. Each okta represents one eighth of the sky covered by cloud.

- **Air pressure**. Air is light but because there is so much of it above us, it exerts a pressure on us. Air pressure is measured by a **barometer**. The units used are millibars. The greater the reading, the higher the pressure.

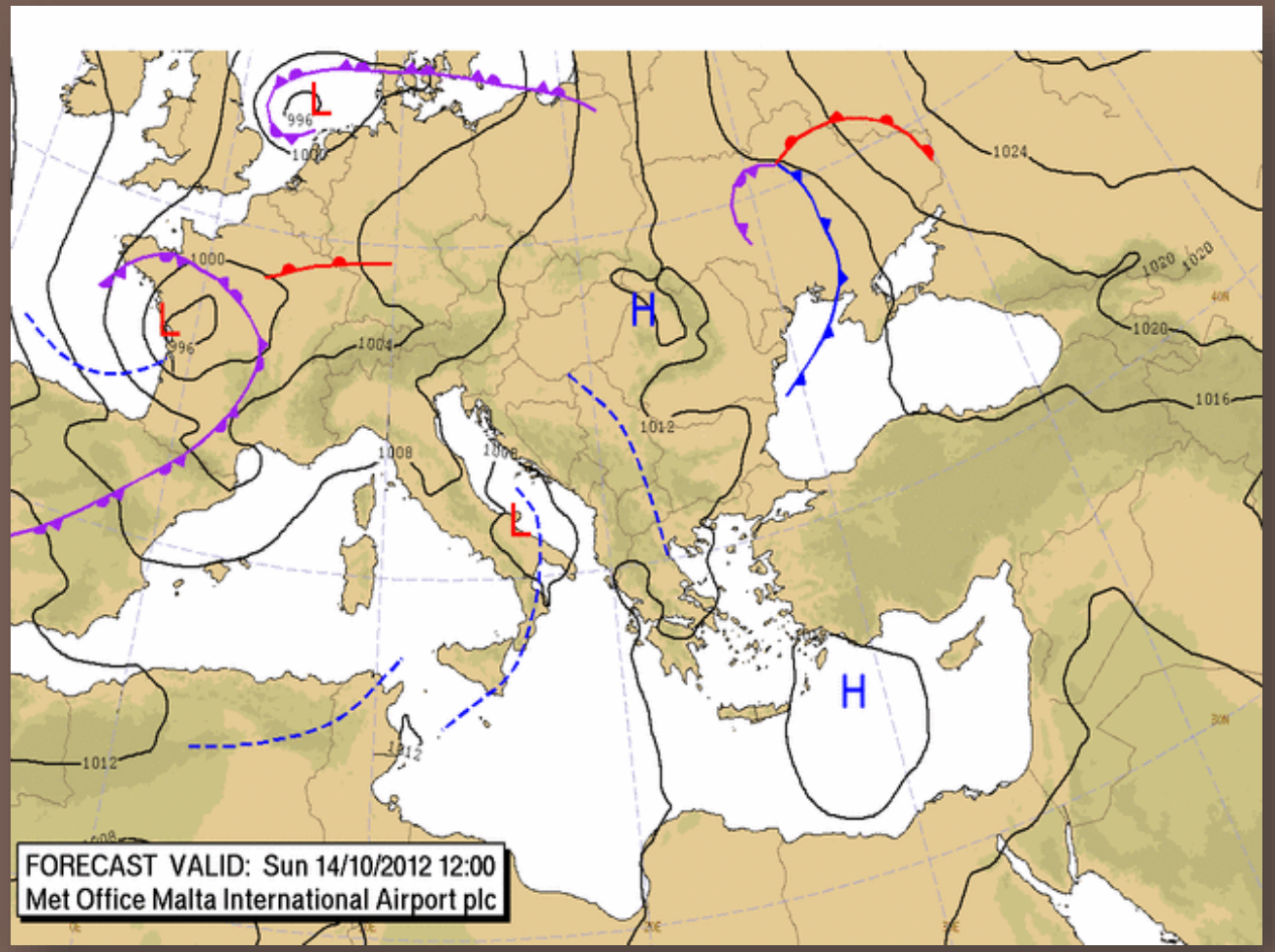
Humidity and dew point

- **Absolute humidity** (the amount of water vapour present in the air).
- **Relative humidity** (the amout of vapour in the air according to its temperature).
- **Dew point** (when water vapour forms when there is a drop in temperature).



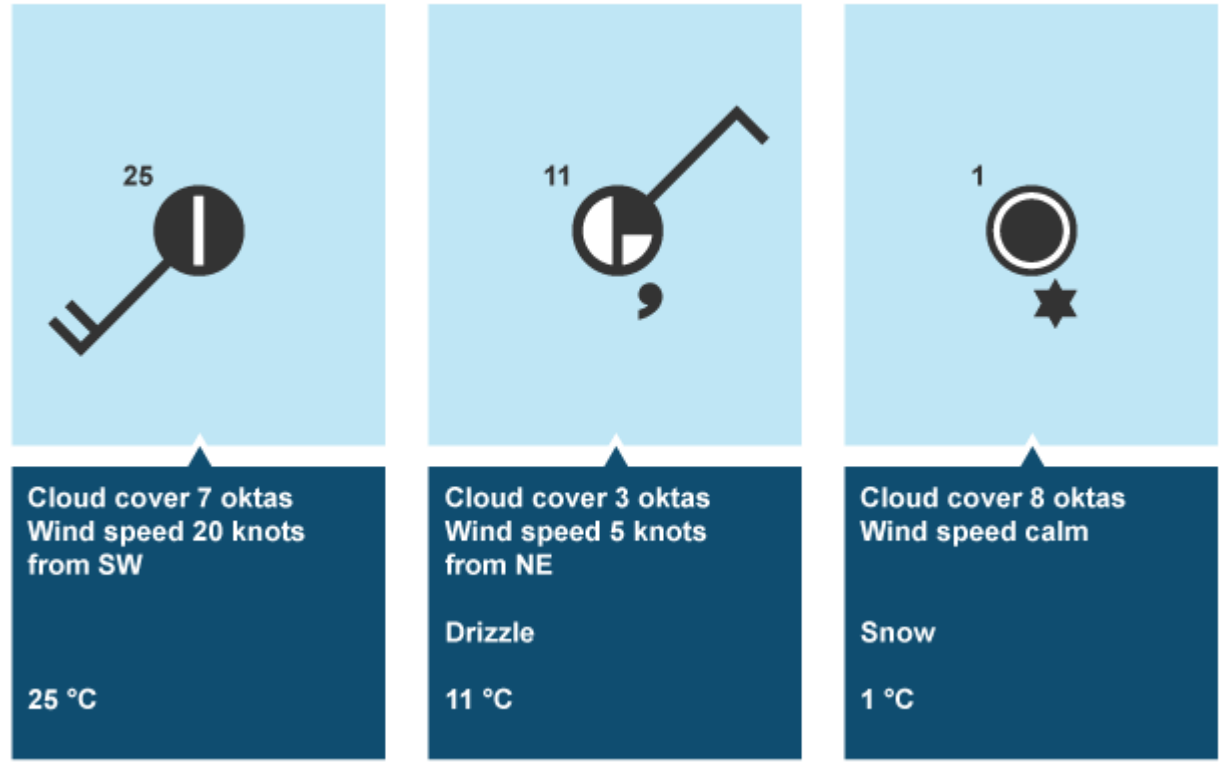
Synoptic charts and symbols

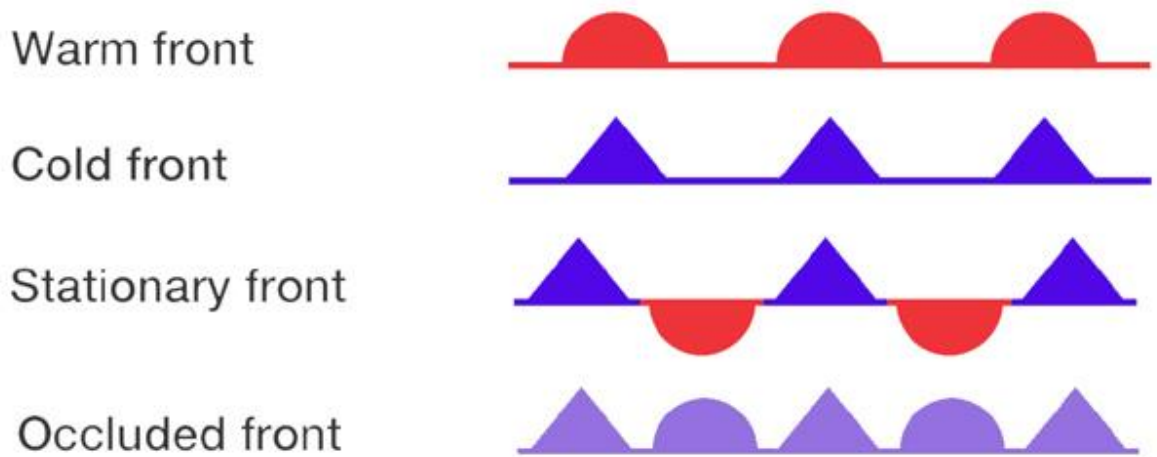
- A **synoptic chart** is any map that summarises atmospheric conditions over a wide area at a given time. It displays information on temperature, precipitation, wind speed and direction, atmospheric pressure and cloud coverage, all observed from many different weather stations, aeroplanes, balloons and satellites.
- **Isobars** (curved lines which join areas with the same pressure). When isobars are very close to each other it means that the wind is very strong.

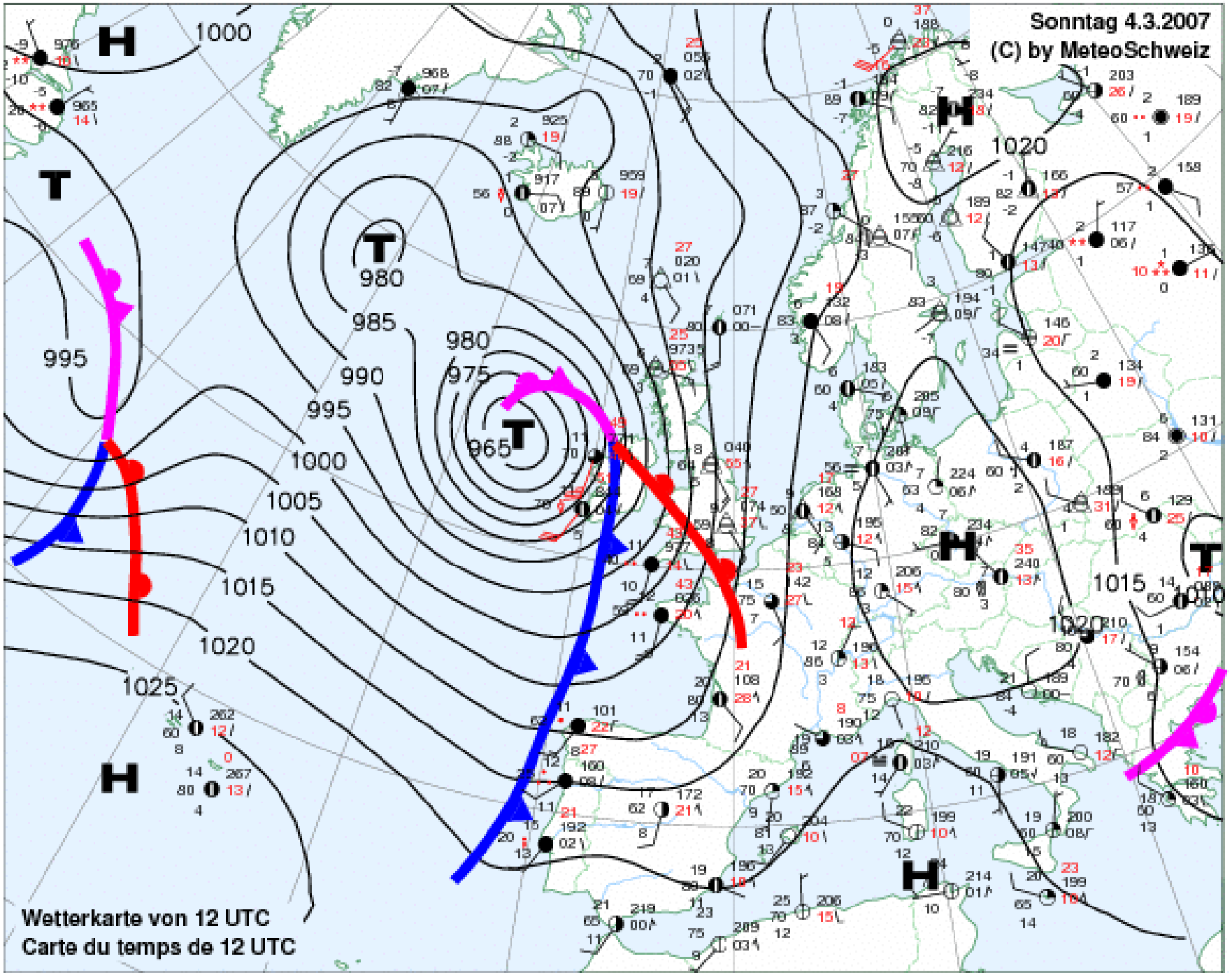


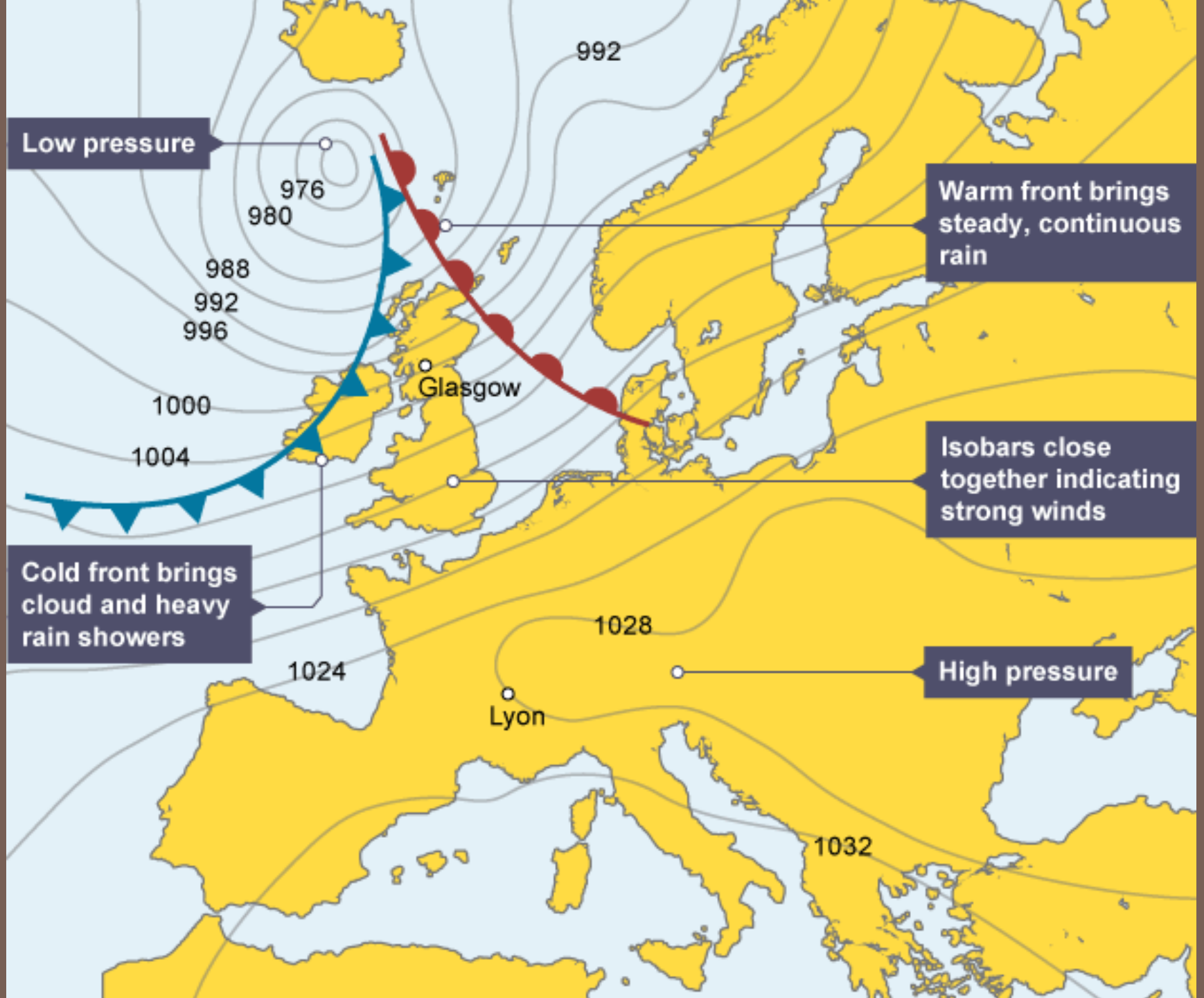
Symbol	Precipitation	Symbol	Cloud cover	Symbol	Wind speed
	Drizzle		Clear sky		Calm
	Rain		One okta		1-2 knots
	Heavy rain		Two oktas		5 knots
	Snow		Three oktas		10 knots
	Mist		Four oktas		15 knots
	Fog		Five oktas		20 knots
	Thunderstorm		Six oktas		50 knots or more
			Seven oktas		
			Eight oktas		
			Sky obscured		

Combining synoptic chart symbols





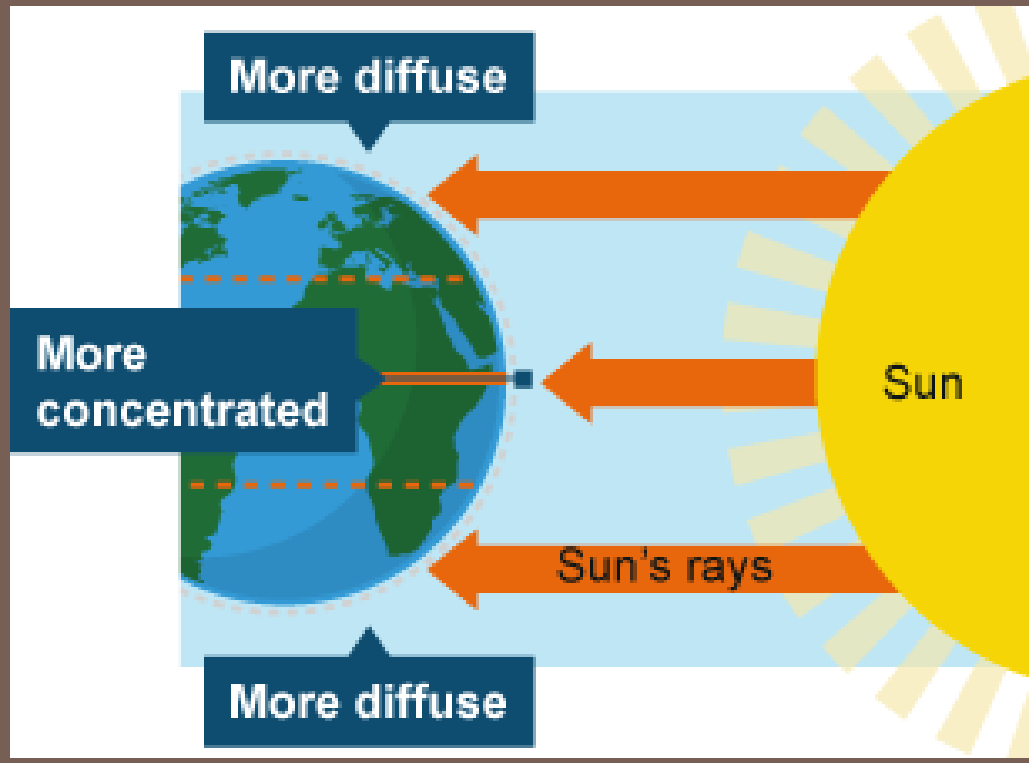

Sonntag 4.3.2007
(C) by MeteoSchweiz
Wetterkarte von 12 UTC
Carte du temps de 12 UTC

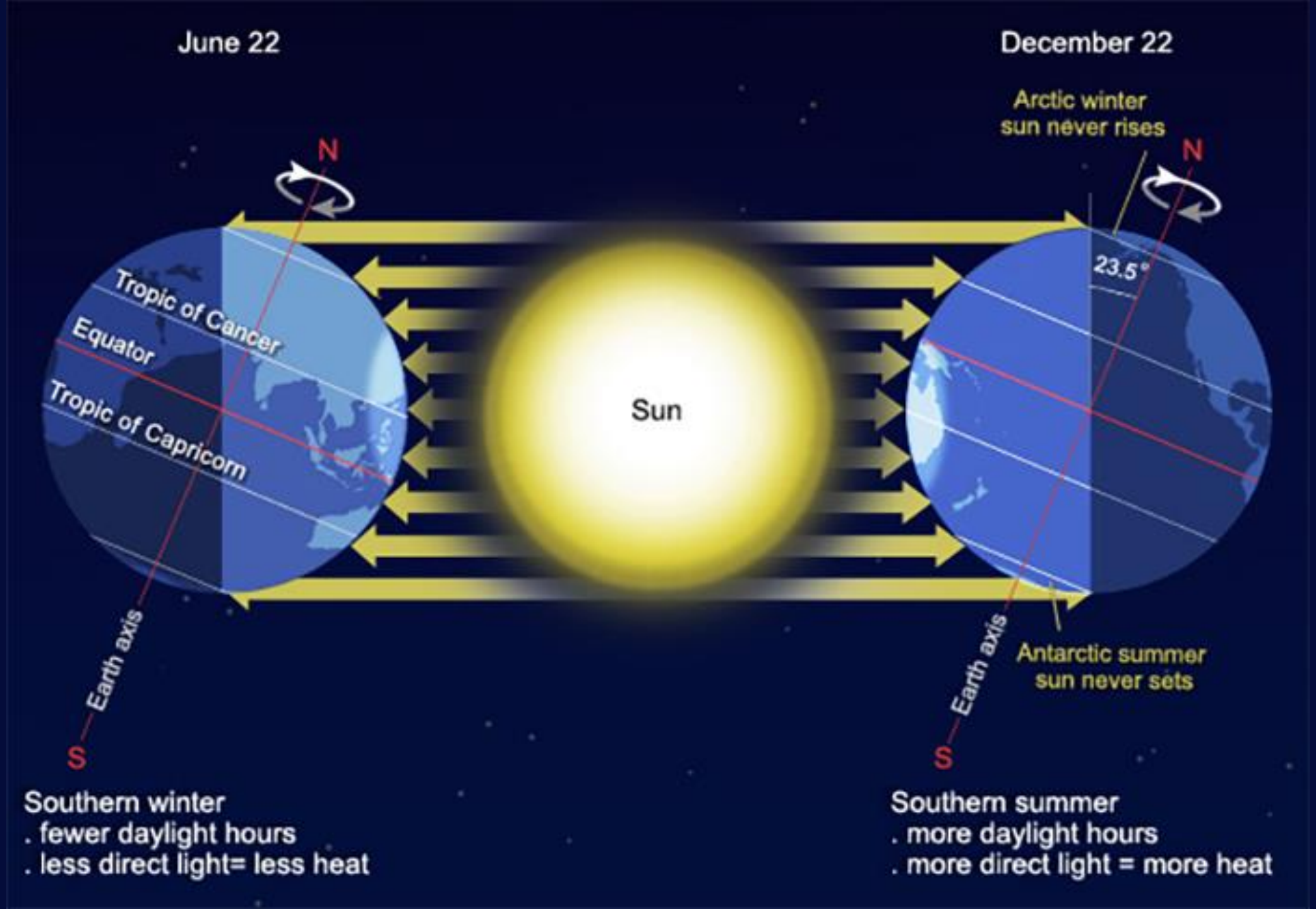

992
Low pressure
976
980
988
992
996
Warm front brings steady, continuous rain
Glasgow
1000
1004
Isobars close together indicating strong winds
Cold front brings cloud and heavy rain showers
1028
1024
High pressure
Lyon
1032

Which factors affect temperature?

LATITUDE

- The sun's heat is **more focused at the centre of the earth so it is colder at the north and south poles**.
- Locations that are further north receive less concentrated energy from the Sun.
- The equator lies directly underneath the Sun and so countries that fall on the equator receive the strongest solar energy. This means that in the Northern Hemisphere, the Sun's energy becomes less concentrated and therefore the temperatures become cooler as you travel north.



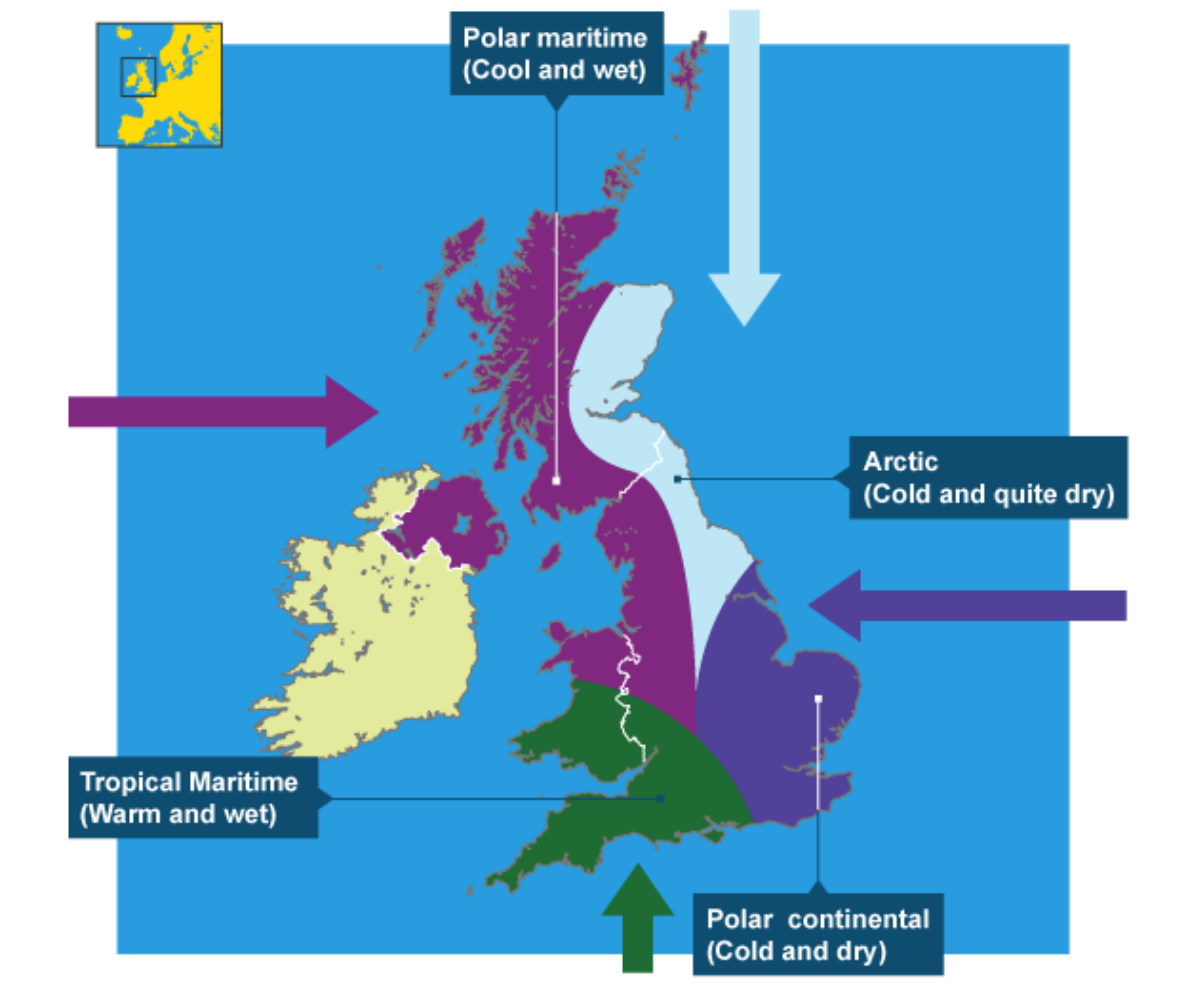

June 22
December 22
Arctic winter
sun never rises
N
N
Tropic of Cancer
Equator
Tropic of Capricorn
Sun
23.5°
Earth axis
Earth axis
S
S
Antarctic summer
sun never sets
Southern winter
. fewer daylight hours
. less direct light= less heat
Southern summer
. more daylight hours
. more direct light = more heat

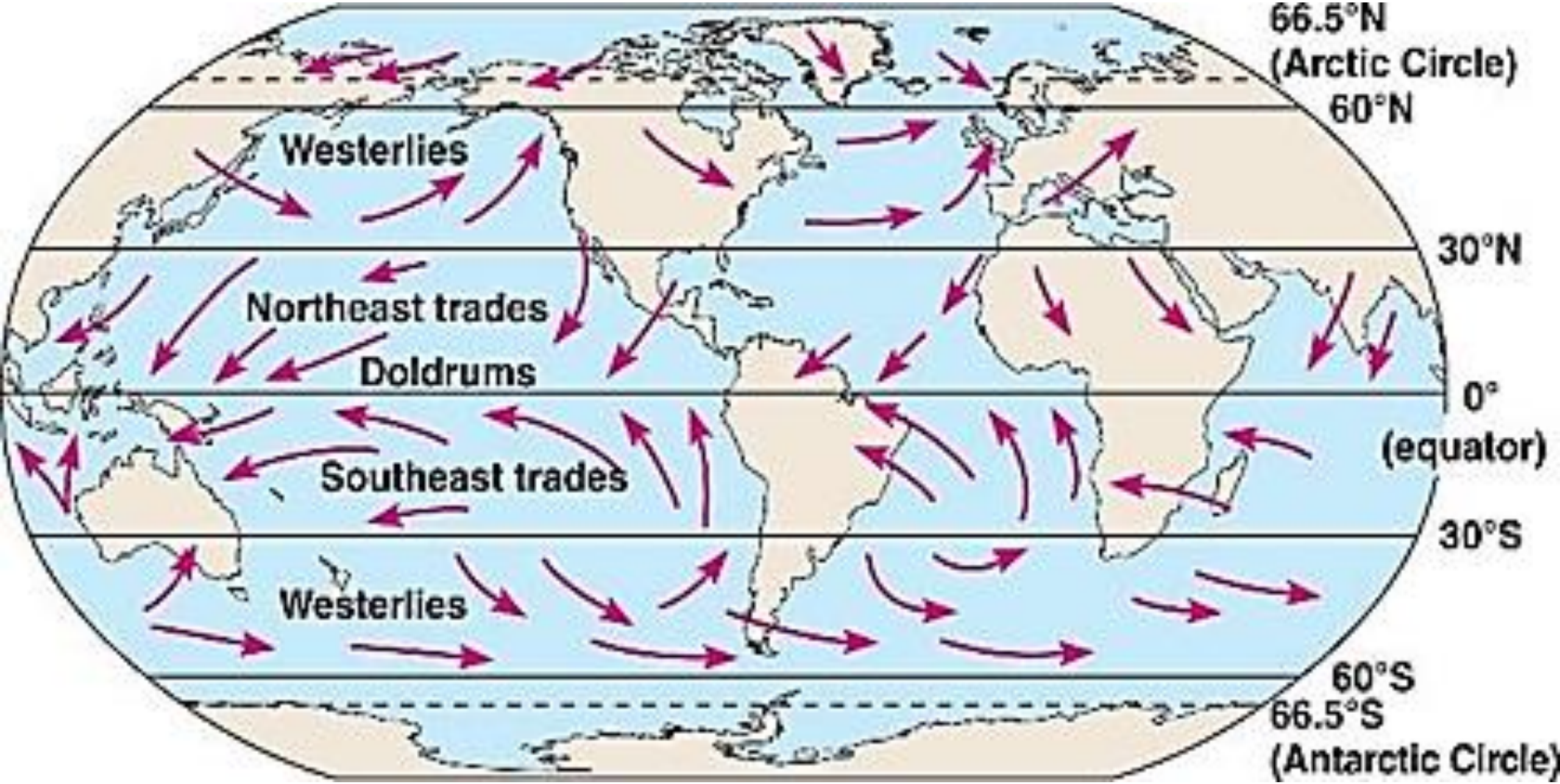
Which factors affect temperature?

PREVAILING WINDS

- Prevailing winds are **the dominant wind direction in an area**. The temperature of the wind and the amount of rainfall partly depend on **where the air has come from**.

Looking at where the air has come from helps to explain the characteristics of the weather. A large body of air with similar characteristics is called an **air mass.**

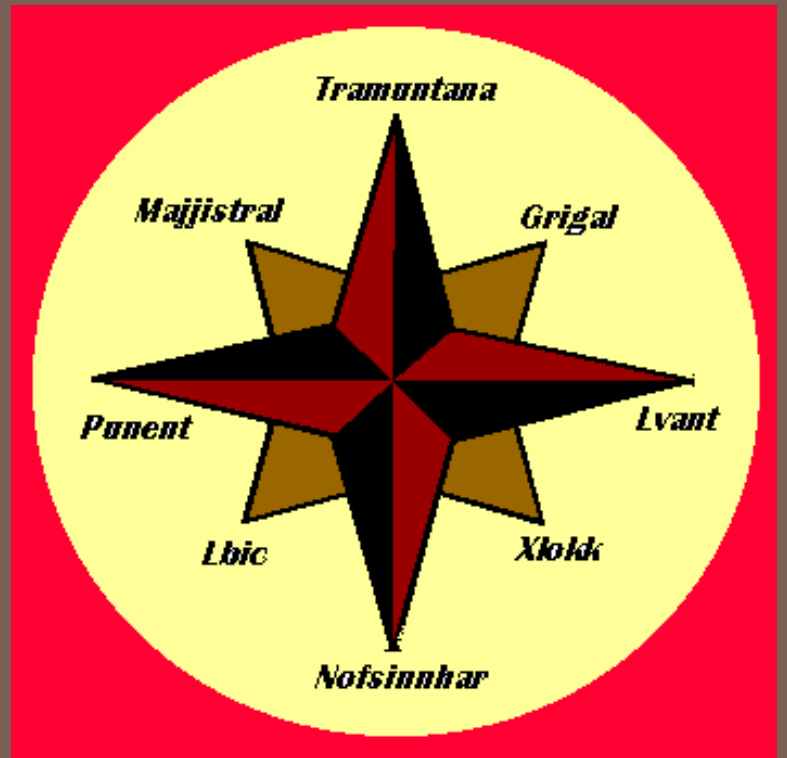



66.5°N
(Arctic Circle)
60°N
Westerlies
30°N
Northeast trades
Doldrums
0°
(equator)
Southeast trades
30°S
Westerlies
60°S
66.5°S
(Antarctic Circle)

Prevailing winds in the maltese islands

The Maltese islands are characterized by the strength and frequency of its winds. The days when no wind blows are very few and on average they are only about 7% of the days(25days) in a year.

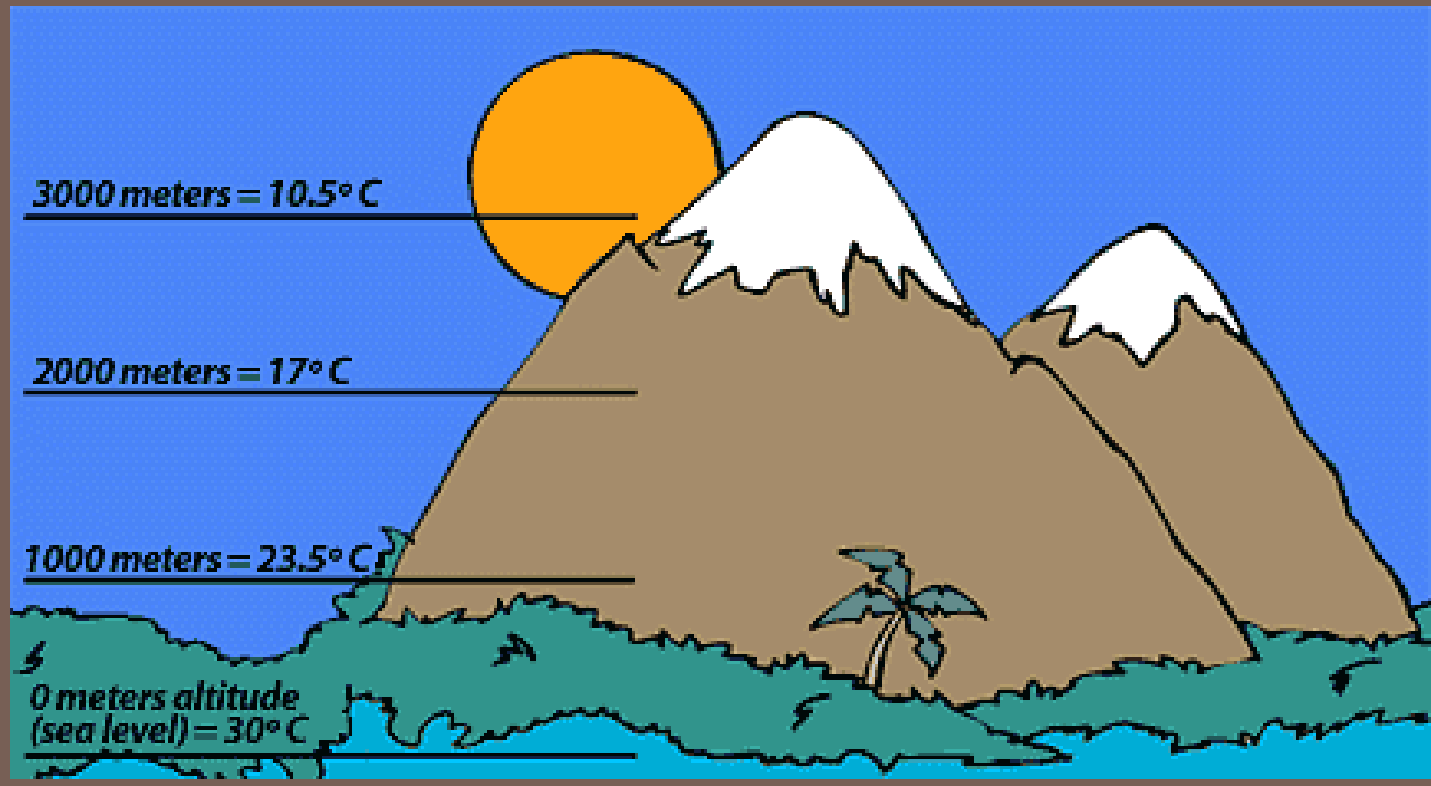
- North Westerly/Majjistral(cold)
- North Easterly/Grigal(violent storms)
- North Wind/Tramuntana(coldest, "riħ fuq")
- South/Nofsinhar(humid, hot, "riħ isfel)
- South East/Xlokk(dust, "xita tal-ħamrija")
- South West/Lbiċ(blowing from Libya, hot, humid)



Which factors affect temperature?

ALTITUDE

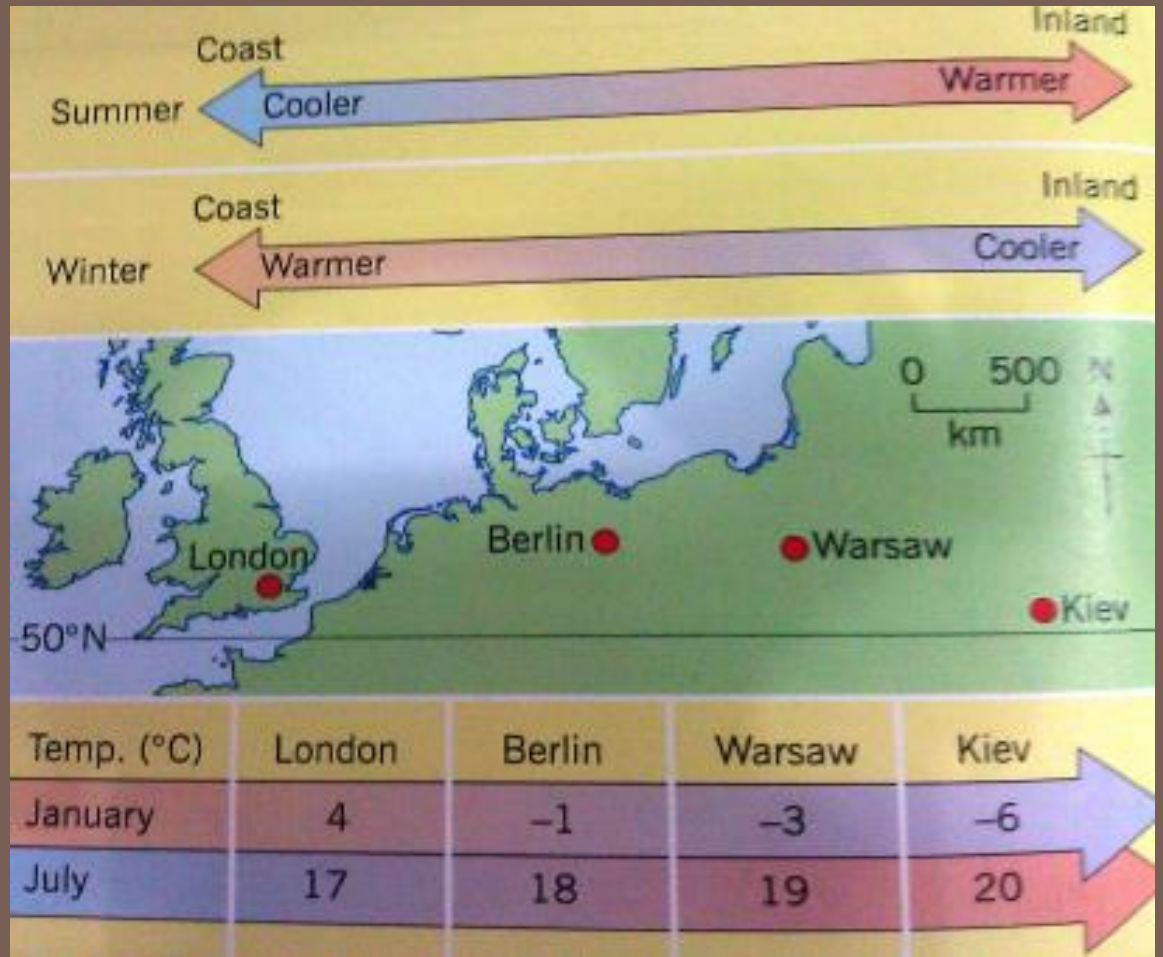
- Temperatures **decrease with altitude**. There is a **1°C drop in temperature for every increase of 100 m** in height. This is because the **air is less dense in higher altitudes**.



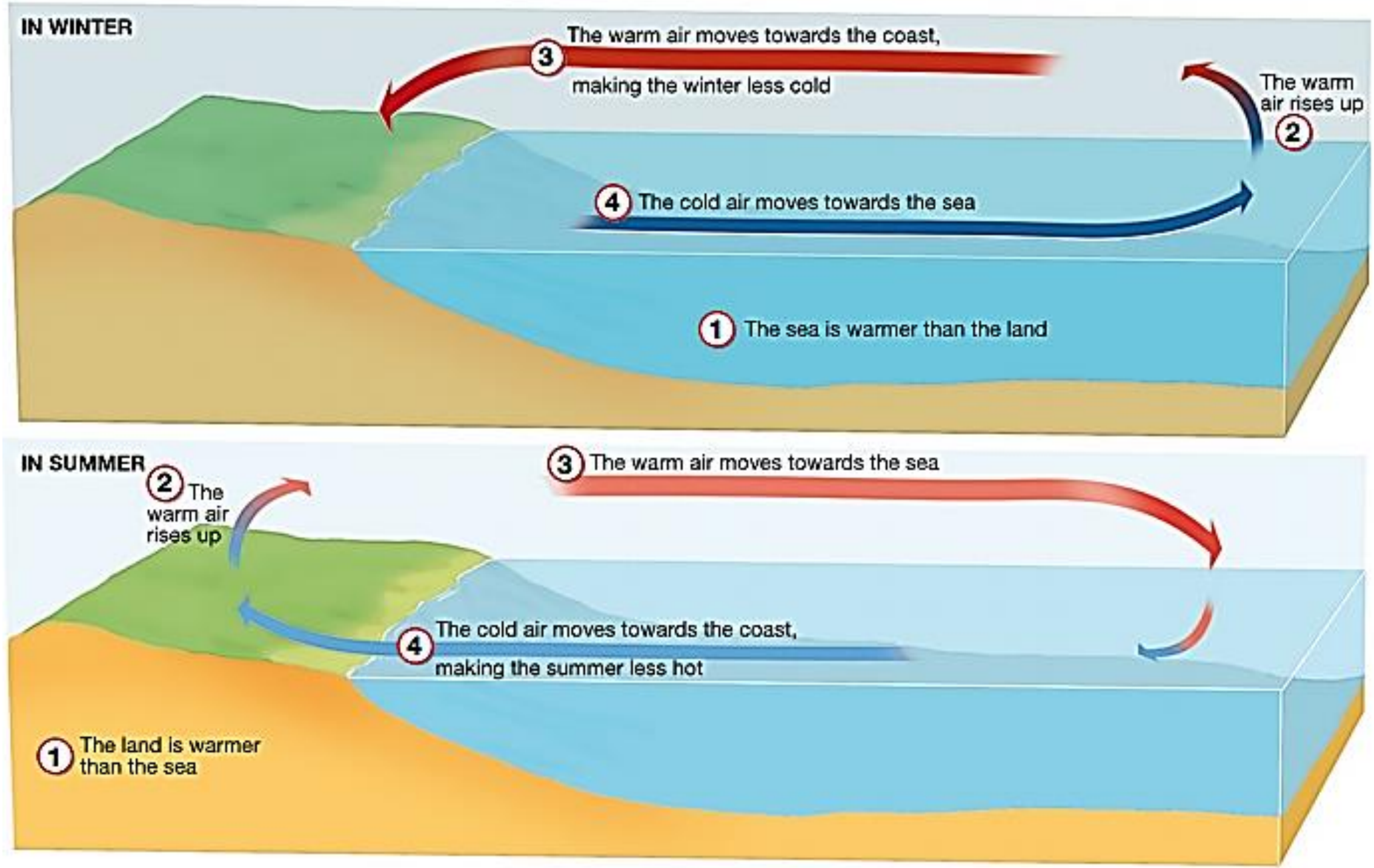
Which factors affect temperature?

DISTANCE FROM THE SEA

- Coastal areas are most affected by the sea. The sea takes longer to heat up and cool down than land. So in the winter the sea keeps coastal areas warm and in summer, it cools them down.



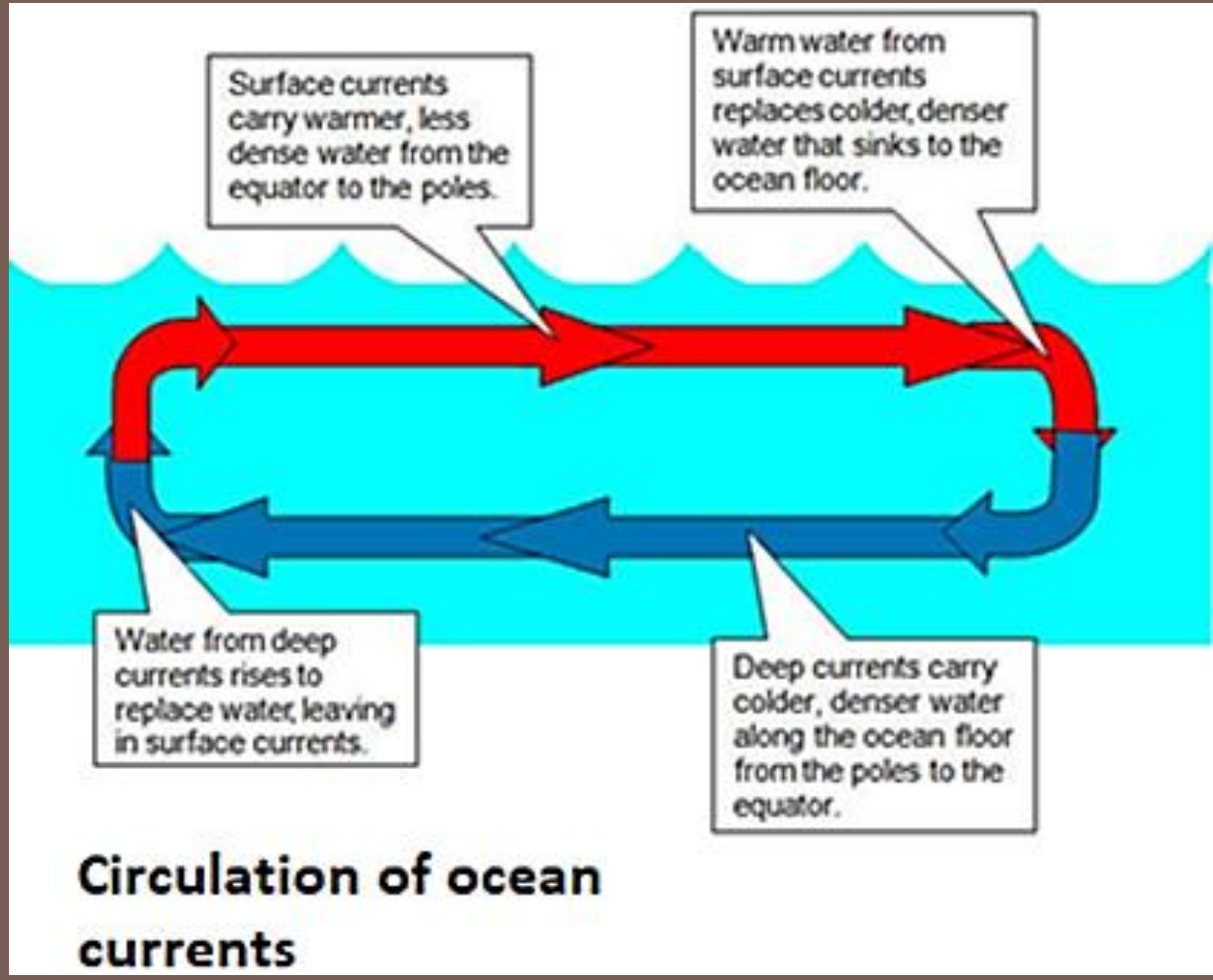
Temp. (°C)	London	Berlin	Warsaw	Kiev
January	4	–1	–3	–6
July	17	18	19	20


IN WINTER
3 The warm air moves towards the coast,
making the winter less cold
The warm air rises up
2
4 The cold air moves towards the sea
1 The sea is warmer than the land
IN SUMMER
2 The warm air rises up
3 The warm air moves towards the sea
4 The cold air moves towards the coast,
making the summer less hot
1 The land is warmer than the sea

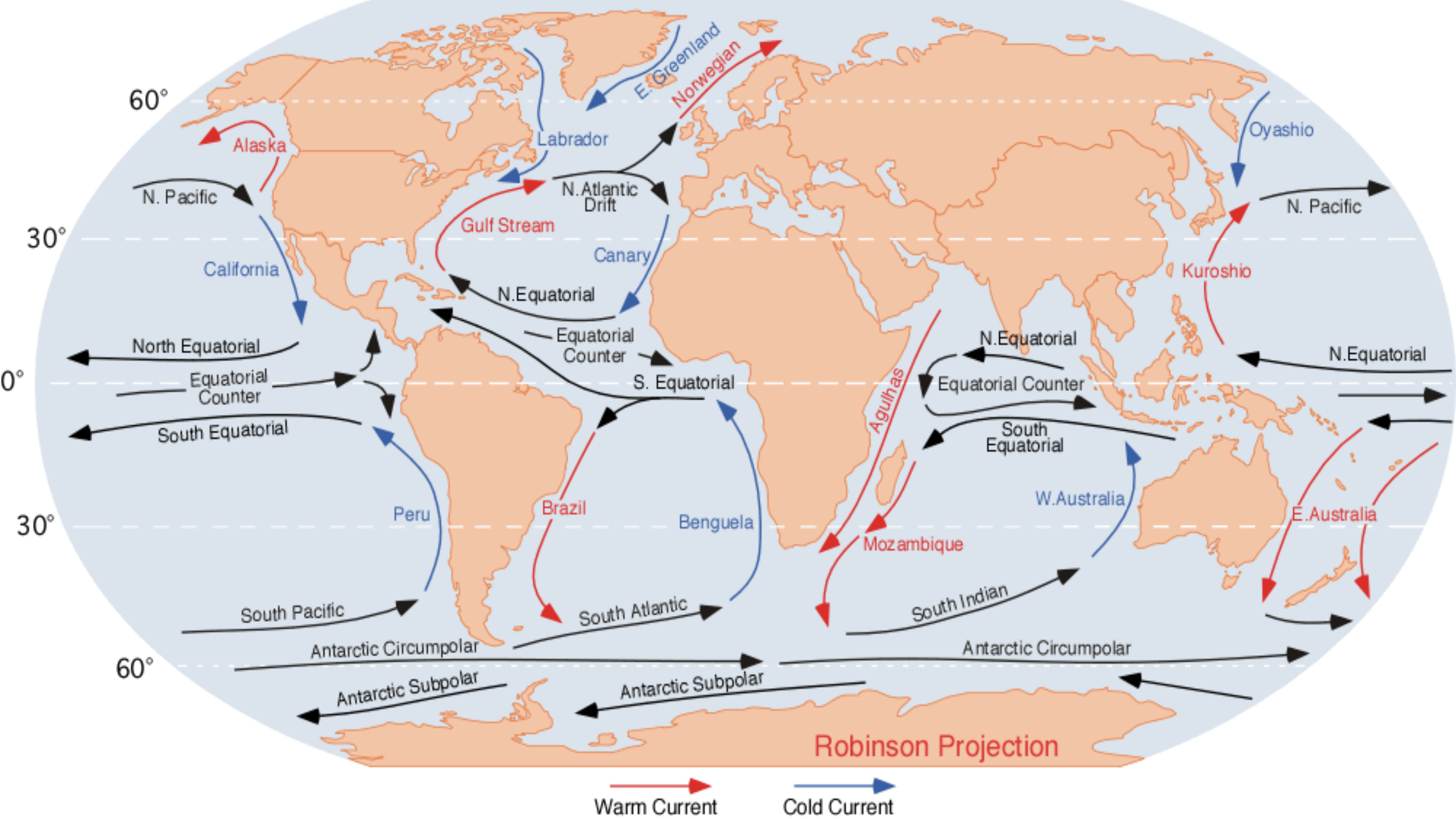
Which factors affect temperature?

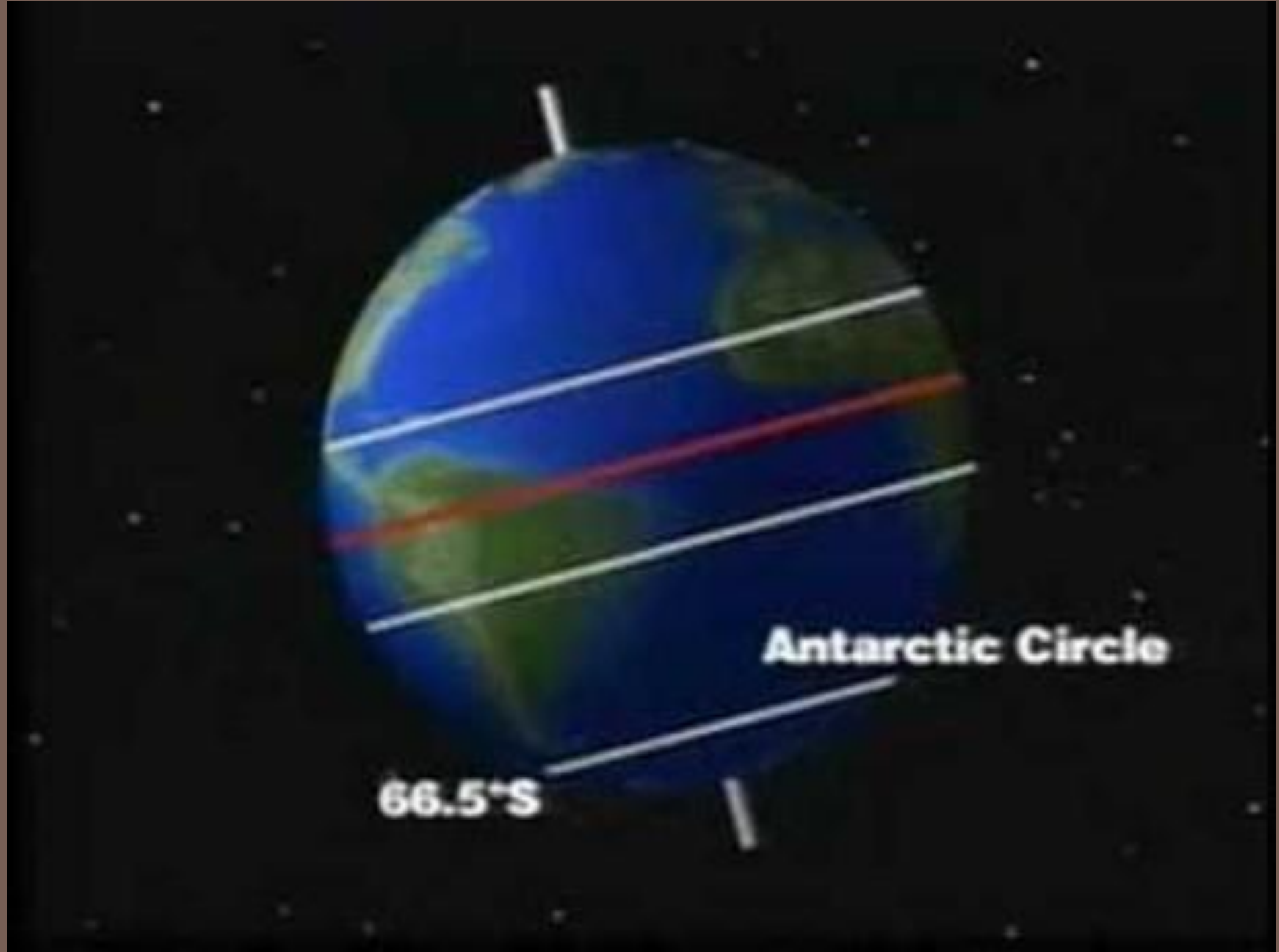
OCEAN CURRENTS

- The effect that ocean currents have on the temperature depends on whether the ocean current is hot or cold. Britain is on the same latitude as Siberia and parts of Russia, yet it does not suffer the same long, harsh winters. Britain's mild climate is partly due to the Gulf Stream, a large Atlantic Ocean current of warm water from the Gulf of Mexico.



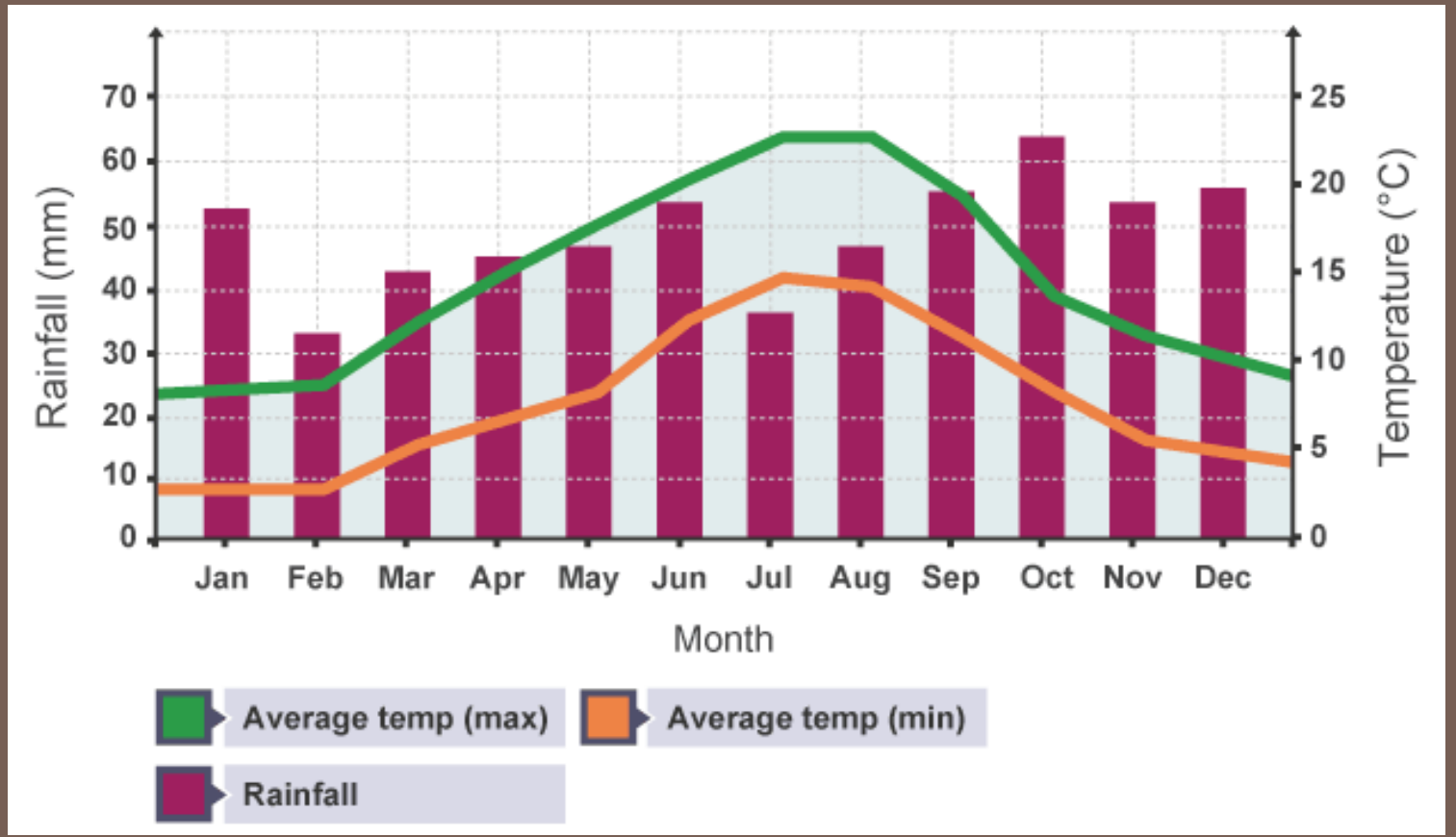
Circulation of ocean currents


60°
30°
0°
30°
60°
Alaska
N. Pacific
California
Labrador
E. Greenland
Norwegian
N.Atlantic Drift
Gulf Stream
Canary
N.Equatorial
North Equatorial
Equatorial Counter
South Equatorial
Equatorial Counter
S. Equatorial
Peru
Brazil
Benguela
South Pacific
South Atlantic
Antarctic Circumpolar
Antarctic Subpolar
Antarctic Subpolar
Oyashio
N. Pacific
Kuroshio
N.Equatorial
N.Equatorial
Equatorial Counter
South Equatorial
Aguilhas
W.Australia
E.Australia
Mozambique
South Indian
Antarctic Circumpolar
Robinson Projection
Warm Current
Cold Current


Antarctic Circle
66.5°S

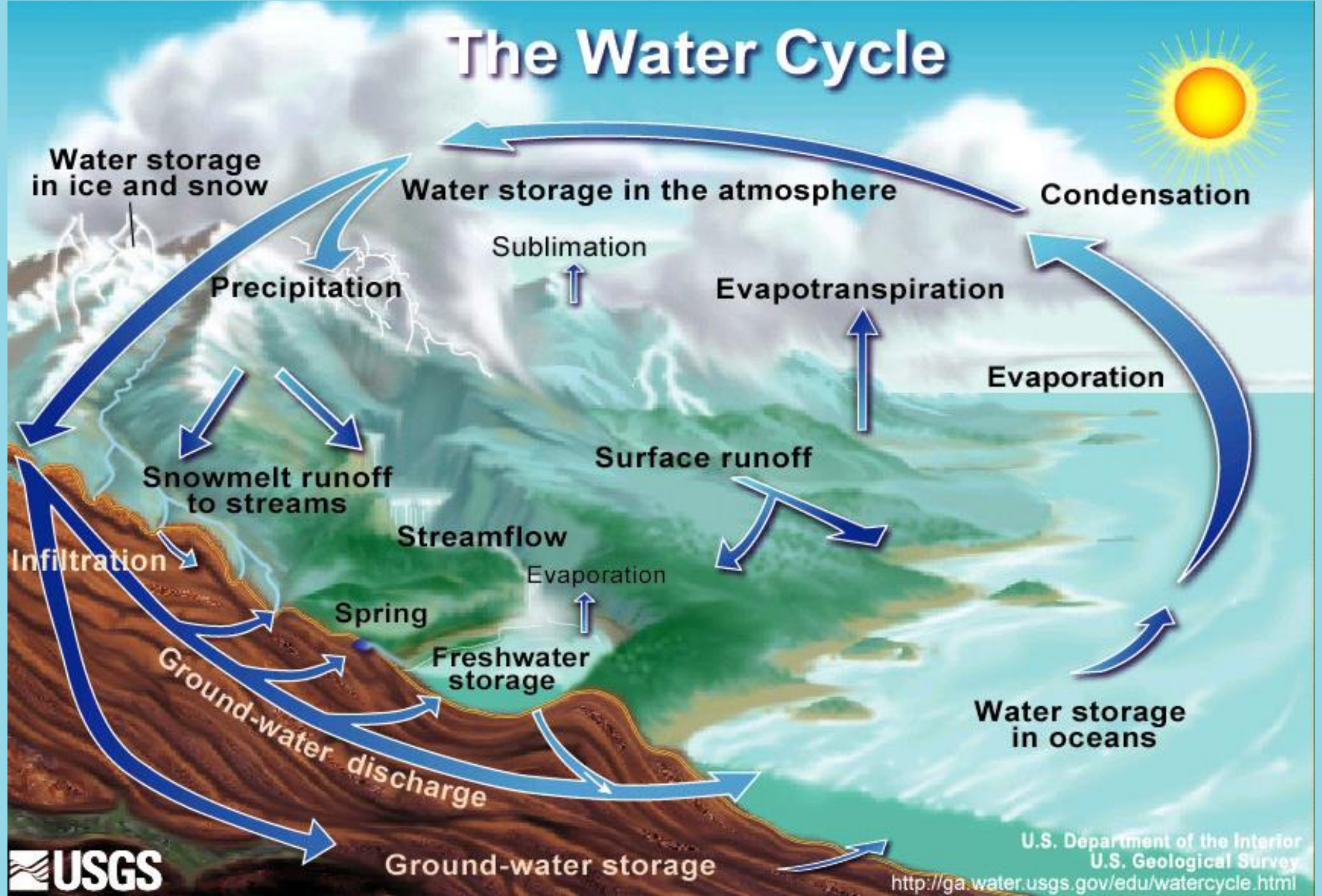
Climate graphs

- **Climate graphs** are a combination of a **bar graph and a line graph**. **Temperature is shown on a line graph**, with the figures being shown on the right side of the graph. **Rainfall is shown by a bar graph**, with the figures being shown down the left side of the graph.



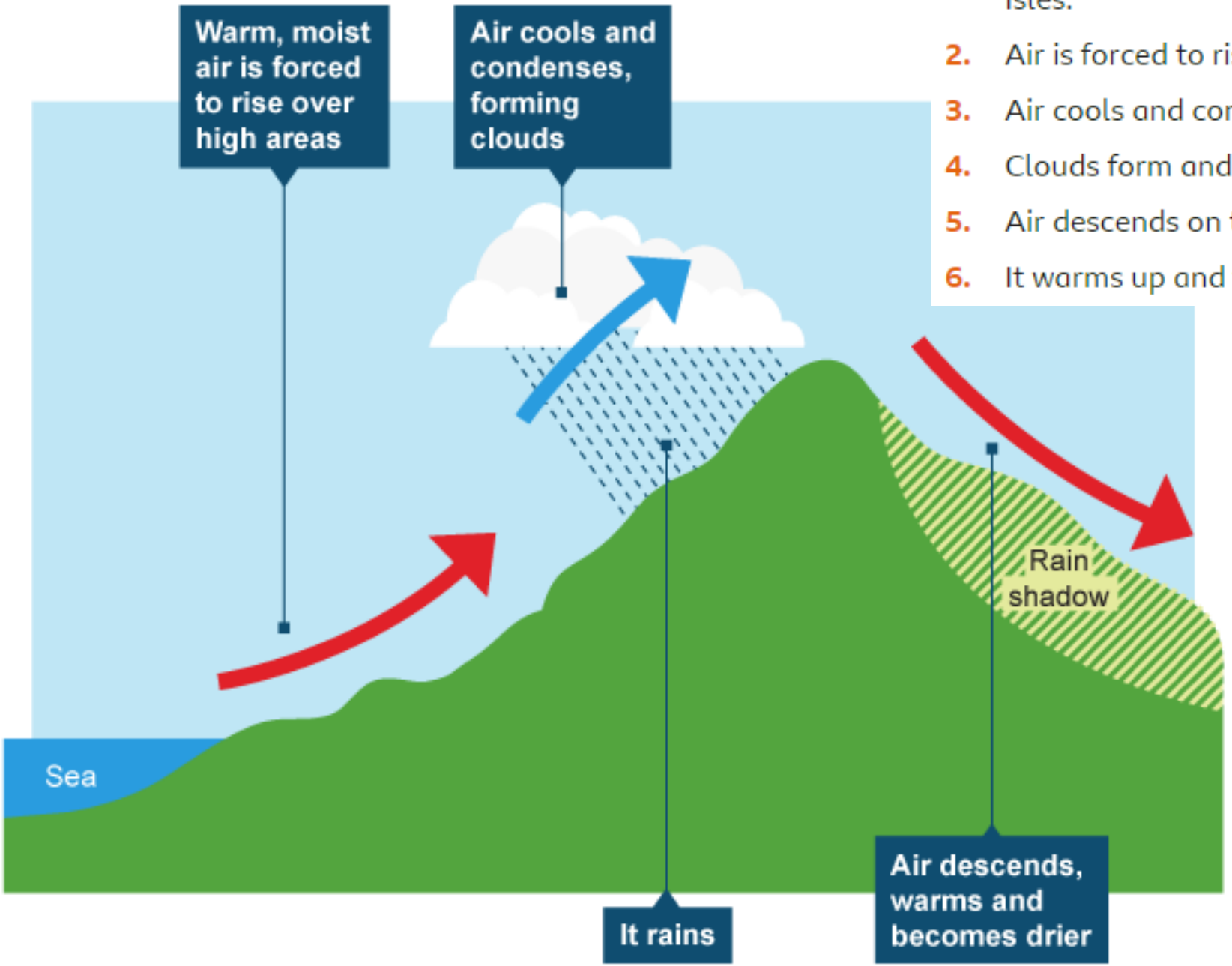
Calculating mean temperatures

- When weather people talk about temperature, they are talking about a **mean daily temperature**. That's an average of a bunch of different measurements. You are usually told an average temperature for a day. That value is the average of all the measurements made at each moment during the day. There is also a **temperature range**. That range is the difference between the hottest and coldest temperatures in a specific amount of time.
- Calculate the **mean monthly temperature** by adding up the daily mean temperatures for each day of a month and then dividing that sum by the number of days in the month. For example, for the month of January, add up the 31 mean daily temperatures, then divide by 31.
- To calculate the **mean annual temperature**, add the mean monthly temperatures for the months of the calendar year, January to December, together, and then divide by 12. This will be the mean annual temperature.

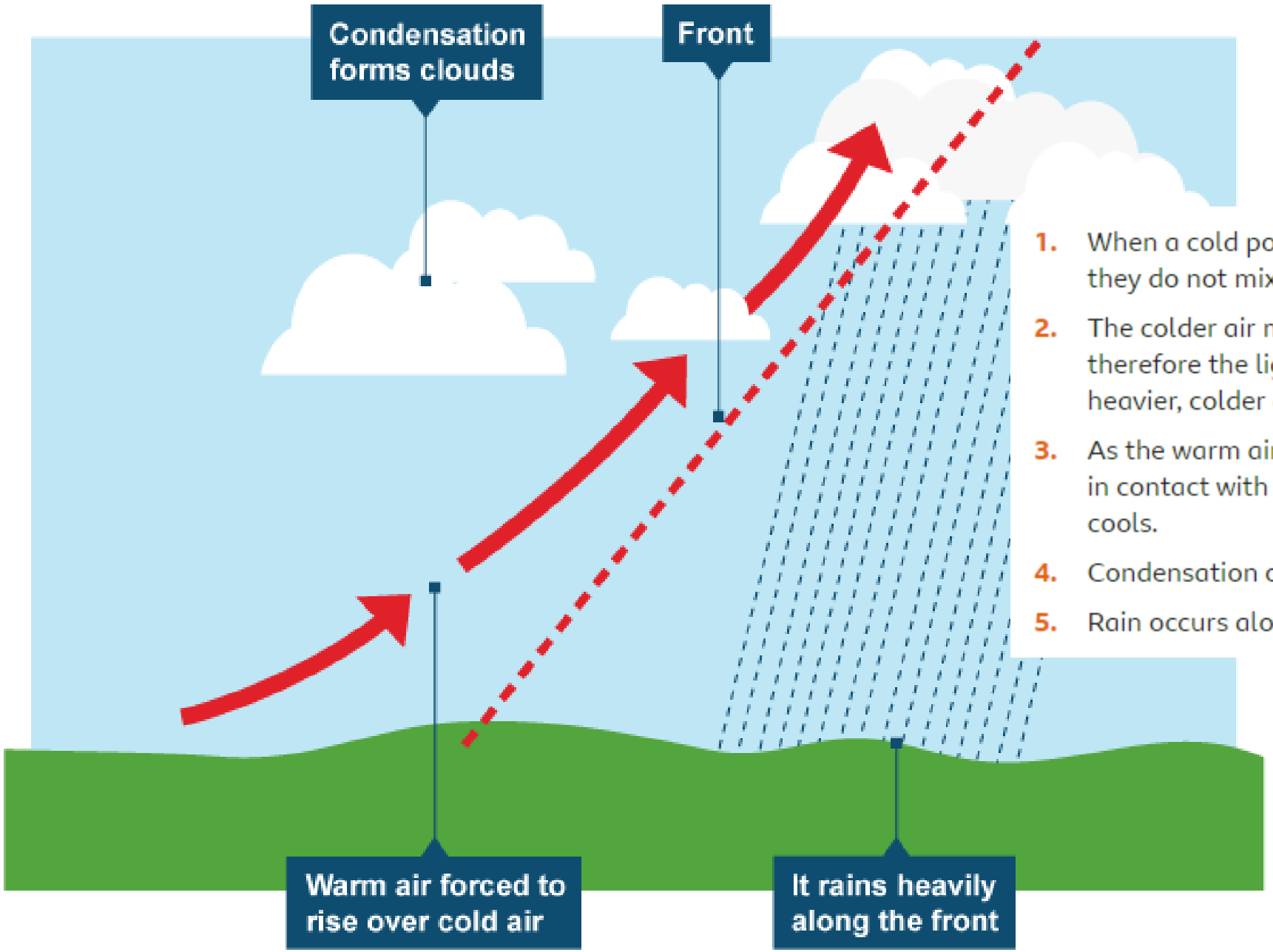

The Water Cycle
Water storage in ice and snow
Water storage in the atmosphere
Condensation
Sublimation
Precipitation
Evapotranspiration
Evaporation
Surface runoff
Snowmelt runoff to streams
Streamflow
Infiltration
Evaporation
Spring
Freshwater storage
Ground-water discharge
Water storage in oceans
Ground-water storage
USGS
U.S. Department of the Interior
U.S. Geological Survey
http://ga.water.usgs.gov/edu/watercycle.html

Relief rainfall

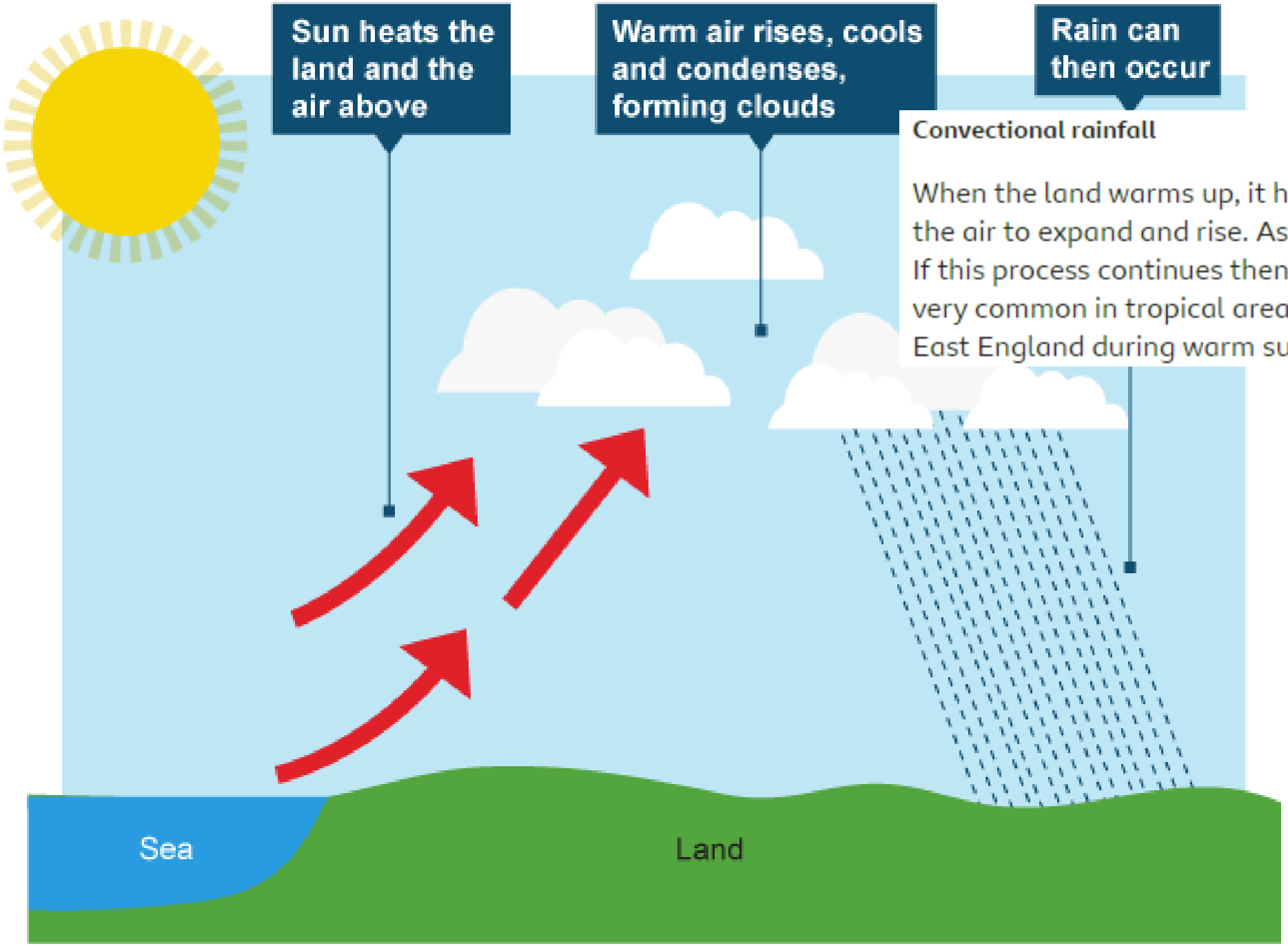
1. Prevailing winds bring warm, moist air to the western British Isles.
2. Air is forced to rise over high areas.
3. Air cools and condenses.
4. Clouds form and it rains.
5. Air descends on the other side of the mountains.
6. It warms up and therefore becomes drier.



Frontal rainfall



1. When a cold polar air mass meets a warm tropical air mass they do not mix - they form fronts.
2. The colder air mass is heavier than the warmer air mass, therefore the lighter, warmer air rises over the top of the heavier, colder air.
3. As the warm air is forced to rise it cools. Also, the warm air is in contact with the cold air along the fronts, and this also cools.
4. Condensation occurs and clouds form.
5. Rain occurs along the front.

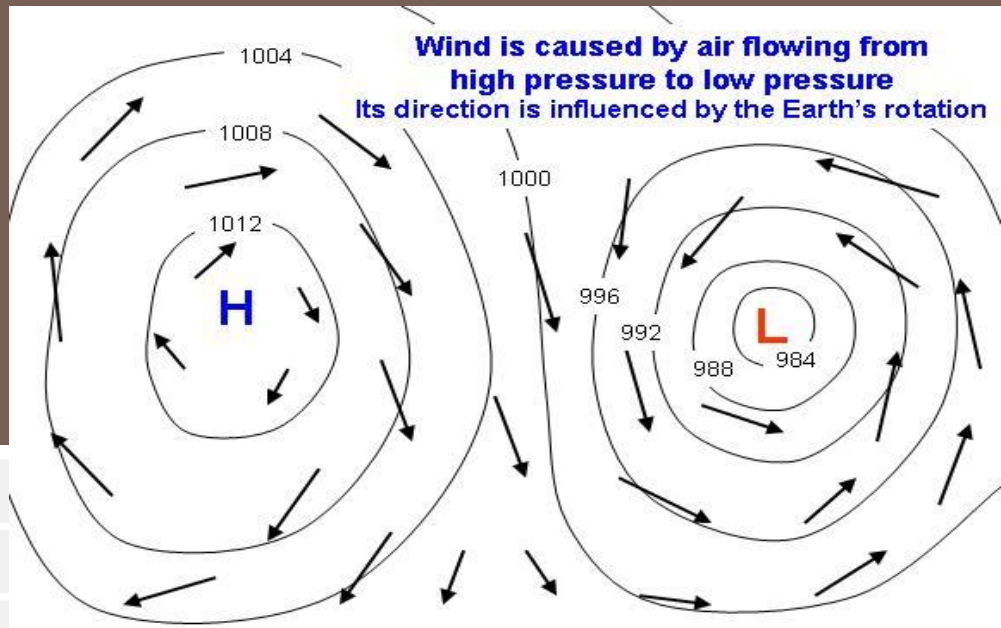


Convectional rainfall

When the land warms up, it heats the air above it. This causes the air to expand and rise. As the air rises it cools and condenses. If this process continues then rain will fall. This type of rainfall is very common in tropical areas but also in areas such as South East England during warm sunny spells.

Wind and air masses

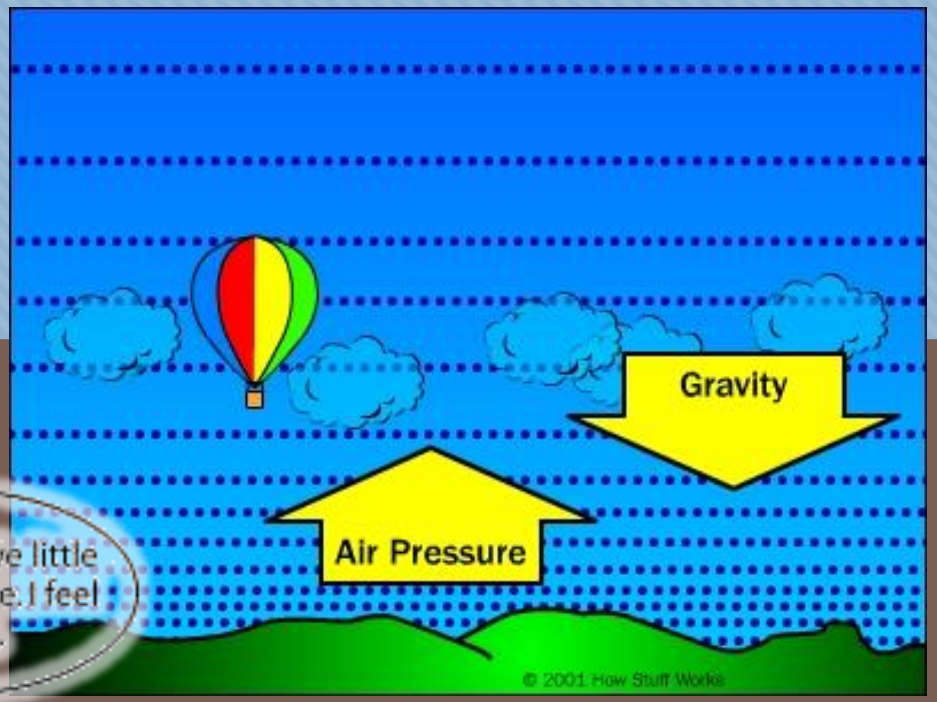
- Wind results due to a change in pressure and blows from an area of high pressure to an area of low pressure. It may be invisible but we can feel it and its effects. Wind direction is always given as the direction from which the wind has come.
- An air mass is a large volume of air which travels from one area to another. The weather an air mass brings is determined by the region it has come from and the type of surface it has moved over.



Source area	Characteristics
Land	Dry
Oceans	Wet
Tropics	Warm
Arctic	Cold

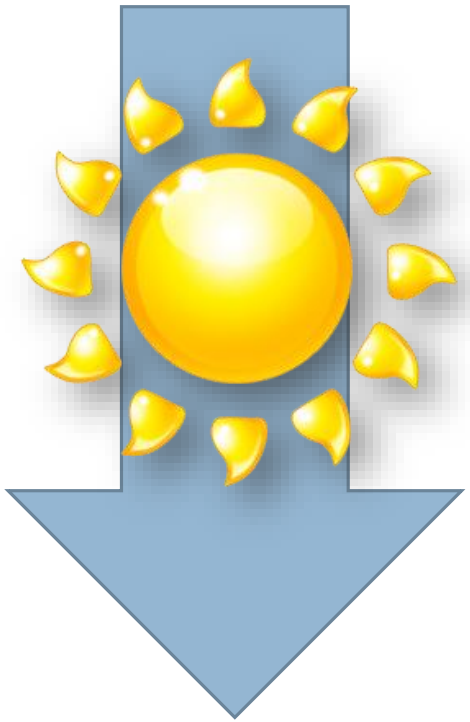
Atmospheric pressure

- Pressure is **the weight of air pressing down on the earth's surface**. Pressure varies from place to place and results in pressure systems.



Rising and sinking air ...

cold air sinks



warm air rises

HIGH PRESSURE = nice weather

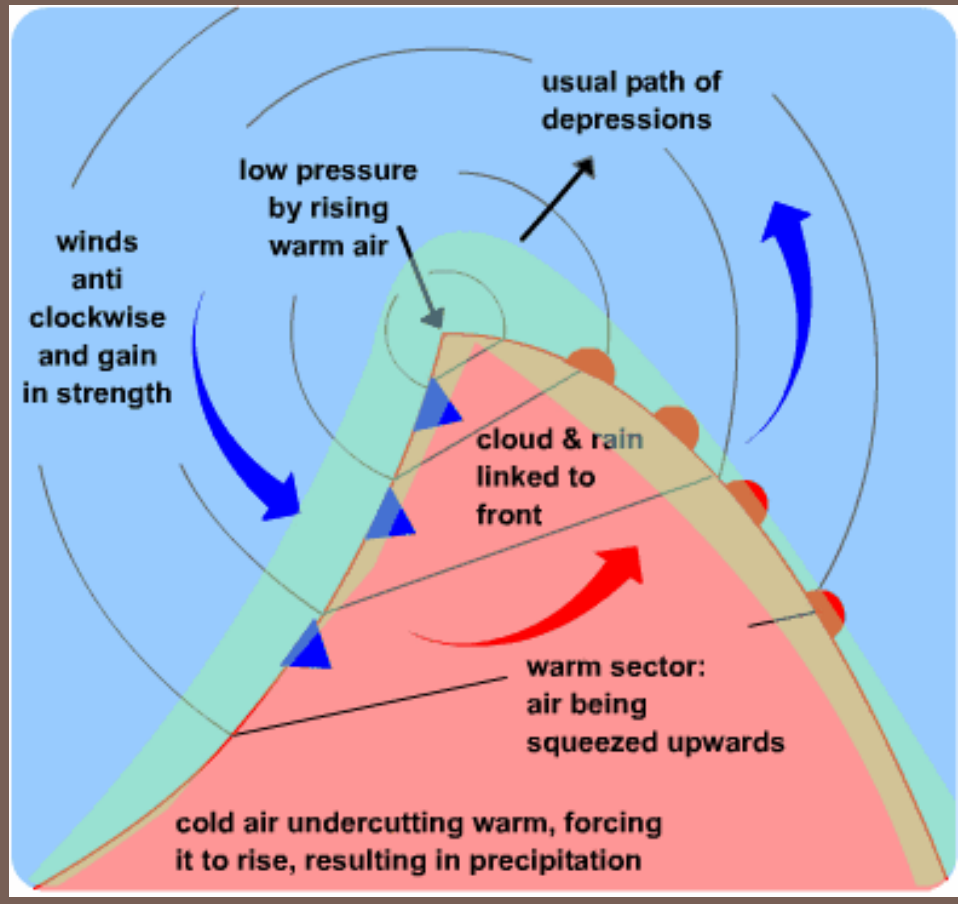
ANTICYCLONE

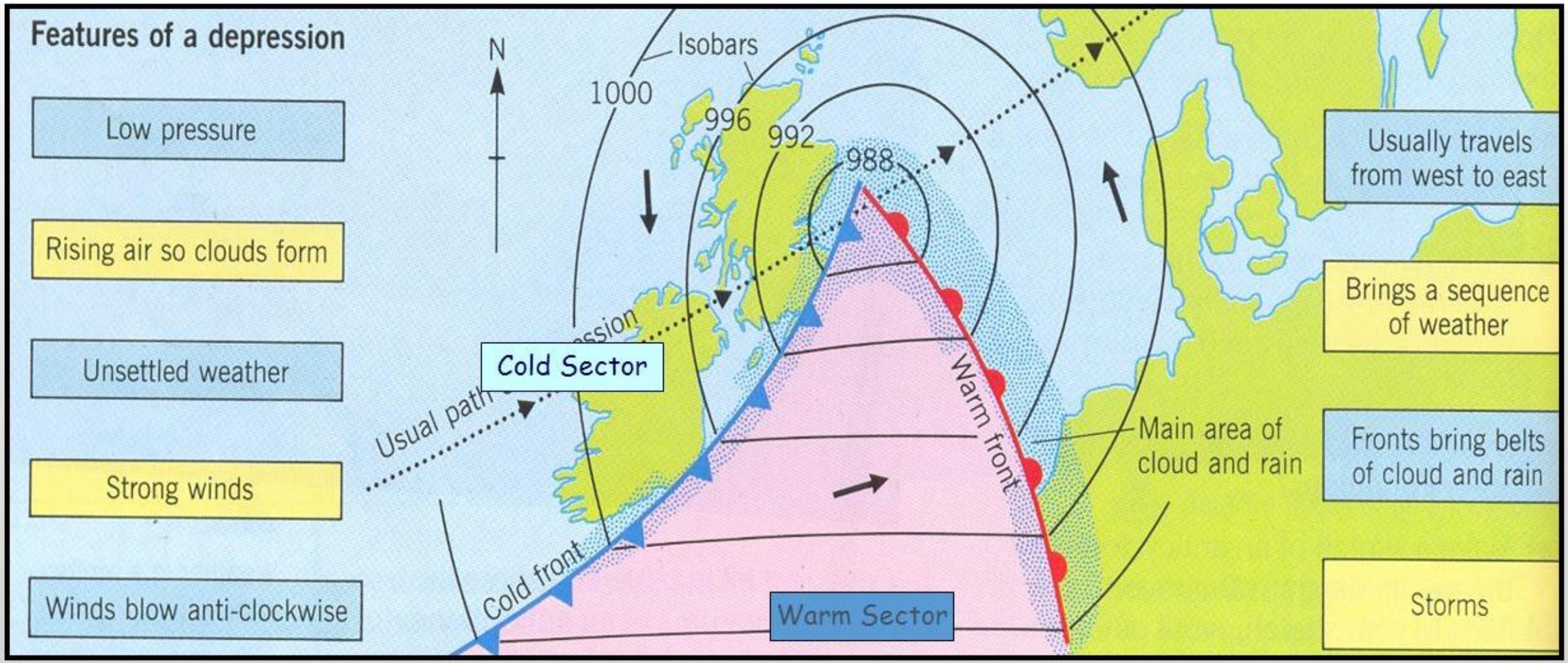
LOW PRESSURE = bad weather

CYCLONE

Depressions

- A **depression** is an area of **low pressure which moves from west to east in the northern hemisphere**.
- Wind - **winds blow anticlockwise** in a depression and wind blows along the isobars. You can work out the wind direction by following the isobars in an anticlockwise direction.
- Wet - where warm air meets cold air, the warm air is pushed upwards where it cools, condenses and **precipitates** (usually as rain). A front is a band of cloud and clouds bring rain.
- Temperature - in general, the **warm airmass** behind the warm front brings warmer temperatures and the cold airmass behind the cold front brings cooler temperatures.




Features of a depression
Low pressure
Rising air so clouds form
Unsettled weather
Strong winds
Winds blow anti-clockwise
N
Isobars
1000
996
992
988
Usual path
Cold Sector
Cold front
Warm front
Warm Sector
Main area of cloud and rain
Usually travels from west to east
Brings a sequence of weather
Fronts bring belts of cloud and rain
Storms


NOAA

Anticyclones

- An anticyclone is an **area of high pressure** which brings long periods of **settled weather**. An area of **heavy cool air sinks** and it warms up as it does so. As it warms it is able to hold more moisture. This means clouds do not form.
- **Isobars are spread** far apart bringing **gentle winds**. This is caused by a very gradual change in air pressure. Because of the gentle winds these systems can remain in place for several days.
- Wind - **winds blow clockwise** in high pressure and wind blows along the isobars. Wind blows gently when isobars are widely spaced.
- Temperature - in summer, **skies are clear with little cloud and temperatures are high**, while in winter, skies are also clear with little cloud, but **temperatures are cold** and there is a likelihood of **frost and fog**.

Features of an anticyclone

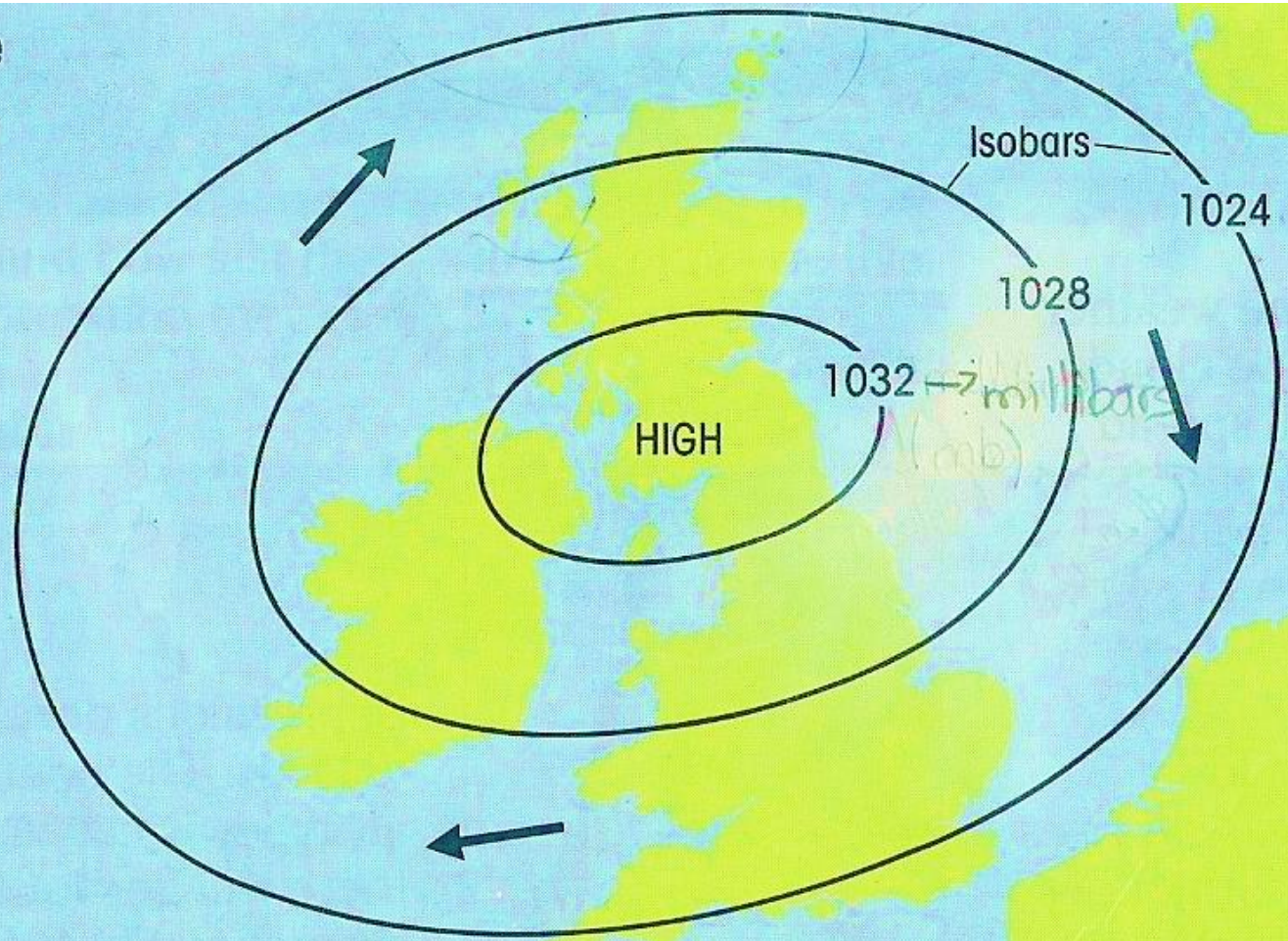
High pressure

Sinking air, so few clouds

Fine settled weather

Light winds

Winds blow clockwise



Often affects the whole country

May last several days

Summers – hot, sunny weather with 'heat wave' conditions

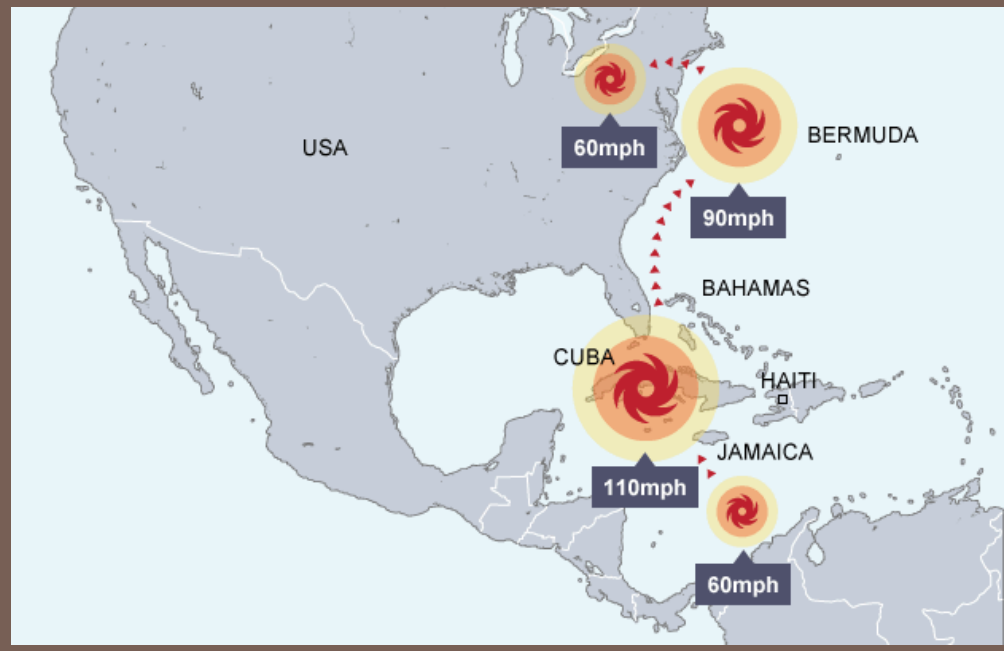
Winters – clear skies, low temperatures, frost and fog

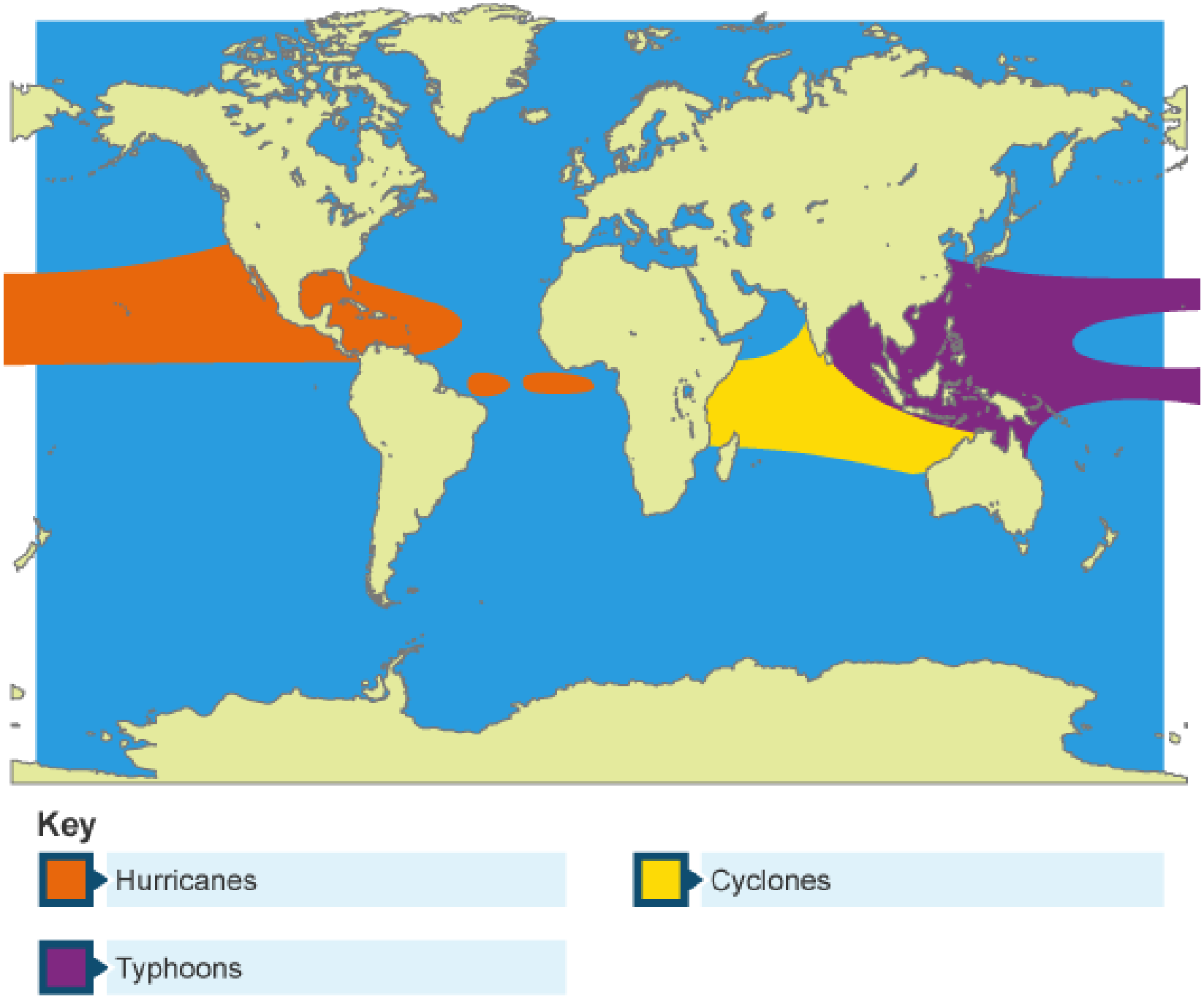
Tropical storms

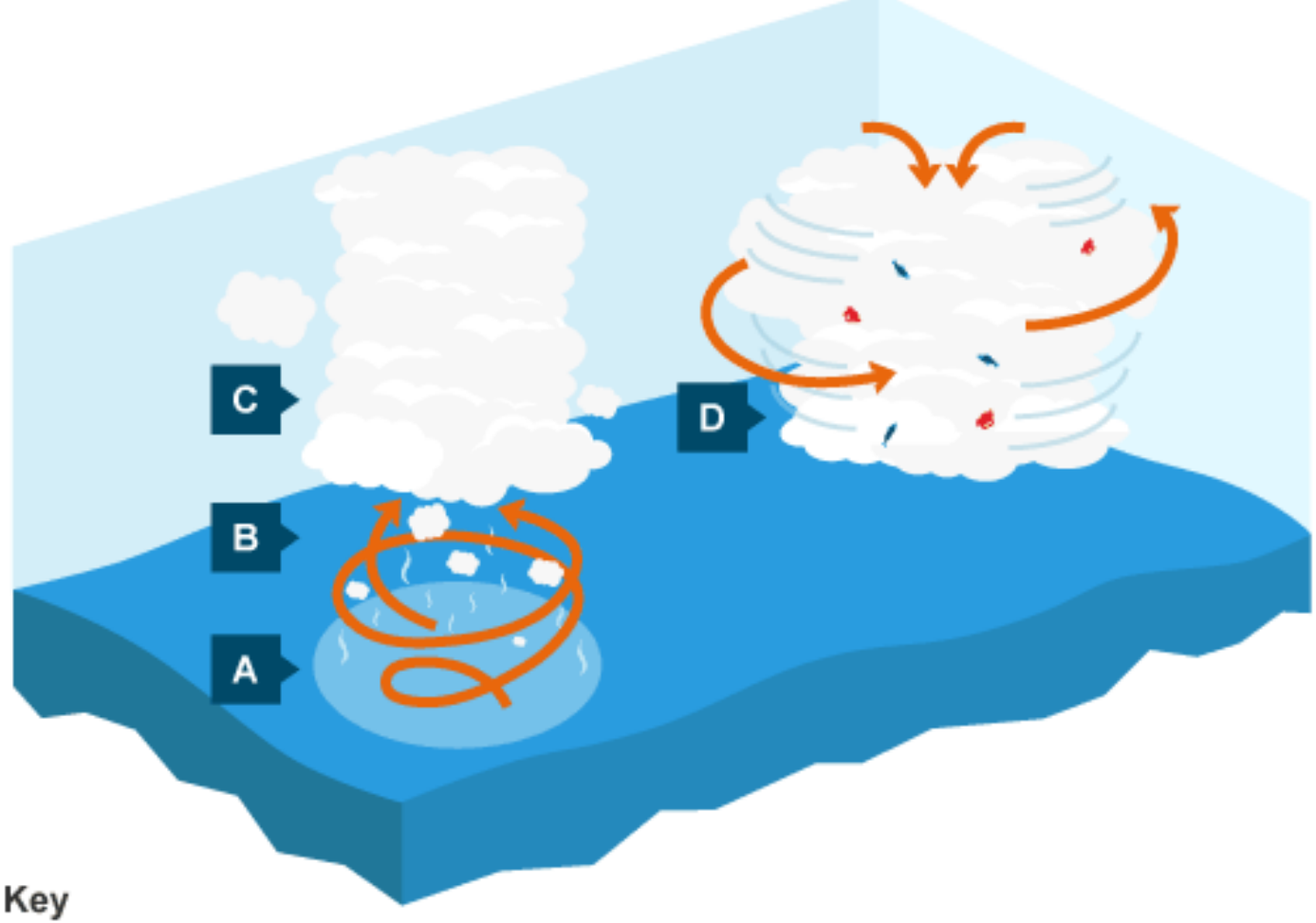
- A tropical storm is a hazard that brings **heavy rainfall, strong winds** and other related hazards such as **mudslides and floods.**
- Tropical storms usually form **between approximately 5° and 30° latitude** and move westward due to easterly winds. The Coriolis force sends them spinning towards the poles.
- In most areas, tropical storms are given **names**. The names are alphabetical and alternate between male and female. This makes storms easier to identify, especially when they are close together.
- It is hard to predict the path of a tropical storm, and therefore difficult to manage an adequate evacuation of an area if needed.

Hurricanes

- The strongest tropical storms are called **hurricanes, typhoons or tropical cyclones**. The different names all mean the same thing, but are used in different parts of the world.
- If these huge storms start in the **Atlantic, off the west coast of Africa**, they are called hurricanes.
- In an average year, over a dozen hurricanes form over the Atlantic Ocean and head westwards towards the **Caribbean, the east coast of Central America and the southern USA** (Florida in particular).
- Hurricanes may last as long as a month and although they travel very slowly - usually at about **24 km/h (15 mph) - wind speeds can reach over 120 km/h (75 mph).**




Key
Hurricanes
Cyclones
Typhoons



Key

- **A** The warm ocean heats the air above
- **B** Rising warm air evaporates and starts to spin
- **C** The air then cools and condenses to form a towering cumulonimbus cloud
- **D** Intense low pressure sucks in air, causing very strong winds

How do tropical storms form?

- Hurricanes need a lot of heat to form, which is why they usually occur over tropical seas (at least 26°C).
- The sun is close to the equator, providing energy to heat the ocean.
- The warm ocean heats the air above it causing it to rise rapidly.
- Water **evaporates** quickly from the hot surface of the ocean, so the rising air contains great amounts of water vapour.
- The rising air starts to spin (anti-clockwise in the northern hemisphere)
- The centre of the storm - the eye - is calm.
- As the air rises it cools, condenses and forms towering **cumulonimbus clouds**.
- The rapidly rising air creates an area of intense low pressure. The low pressure sucks in air, causing very strong winds.
- Once the storm moves over land it starts to lose energy and fades.

Impacts on people and property

- The intense winds of tropical storms can destroy **whole communities, buildings and communication networks.**
- As well as their own destructive energy, the winds generate abnormally **high waves and tidal surges.**
- Sometimes the most destructive elements of a storm are the subsequent high seas and **flooding**.

Impacts on people and property

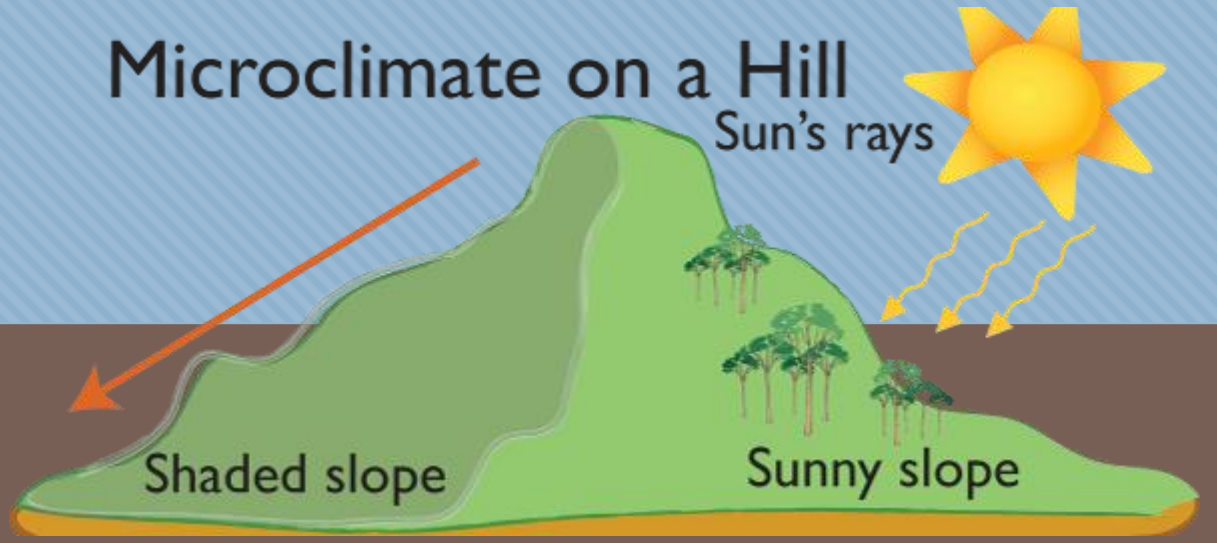
- **MEDCs** are better placed to reduce the effects of tropical storms because they have more **financial, educational and technological resources** to help deal with them.
- They better able to **observe and predict storm behaviour** and can invest in **infrastructure** to withstand storms - as well as spending more money on **repairing the damage** caused.

Impacts on people and property

The main **hazards** that a hurricane can bring are:

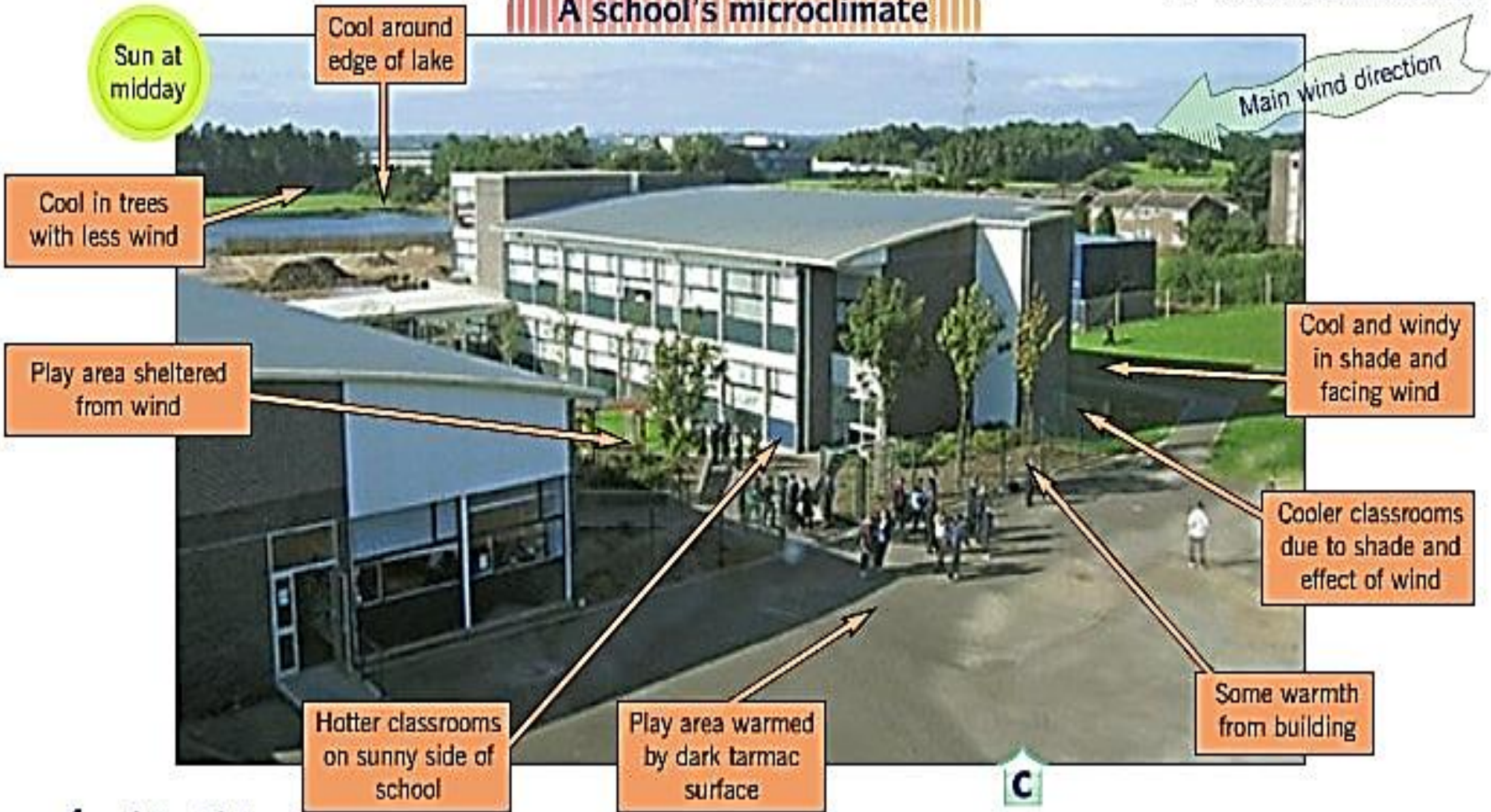
- **Storm surge:** this is a rise in the sea levels as the high winds push the sea up and towards the coastline. This wall cause extensive flooding to lowland areas which can cause damage to property and kill people.
- **Flooding:** intense rain can also cause damage to property and crops in the fields. Heavy rain can cause inland flooding.
- High wind speeds can also cause **devastation to homes, buildings, property and local infrastructure.**

Microclimates



- Microclimate is **the climate of small areas**, such as gardens, cities, lakes, valleys, and forests.
- Climatic conditions in an area can be affected by the **landscape, relief and activities taking place** (both human and natural). Climate can **alter over time and space.**
- Within a climatic region, the climate may **vary from place to place**, eg. the top of a hill, the sunny side of a hill, the shaded side of a hill and the bottom of a hill. These areas with their small variations are called **microclimates.**

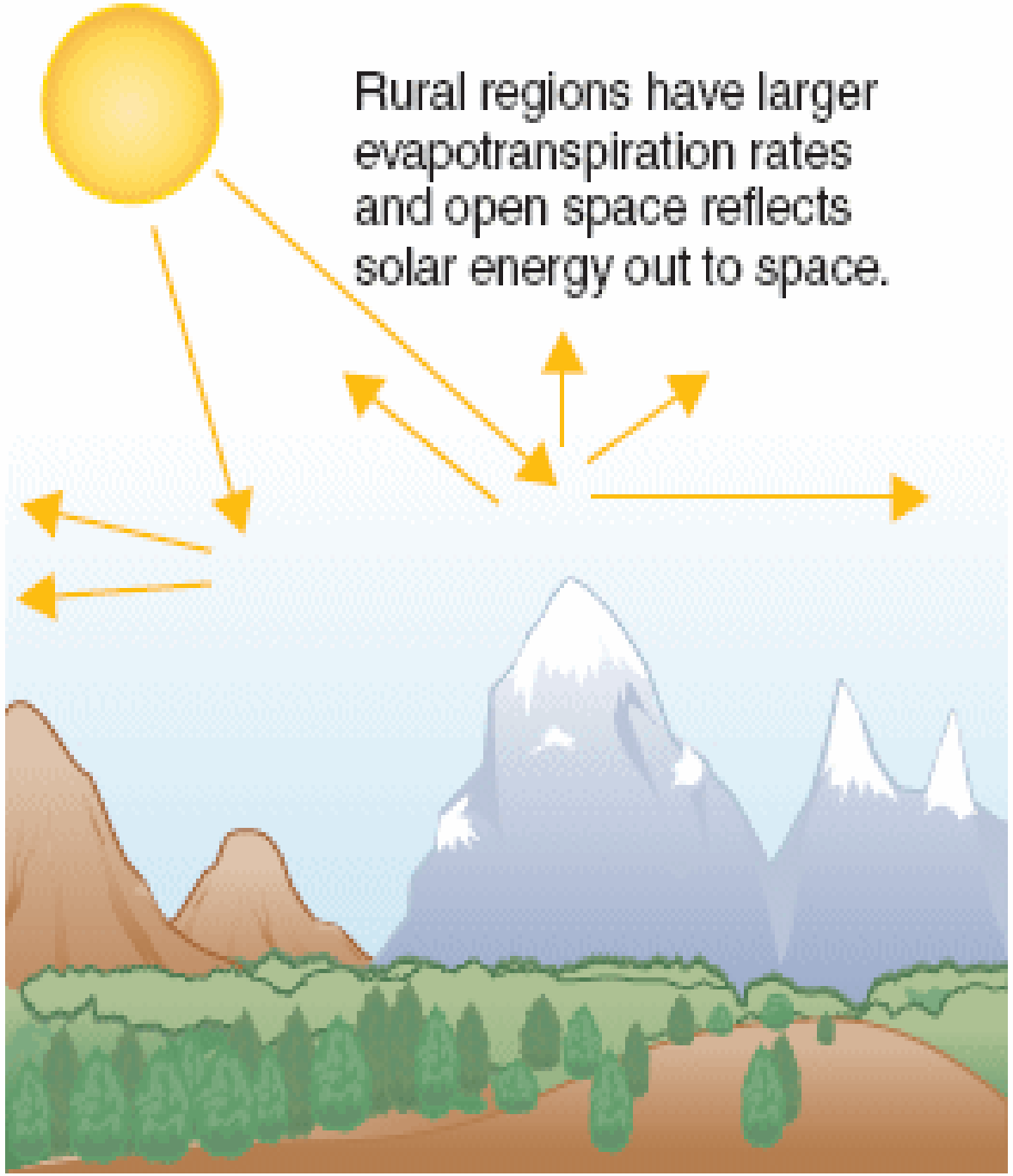
A school's microclimate

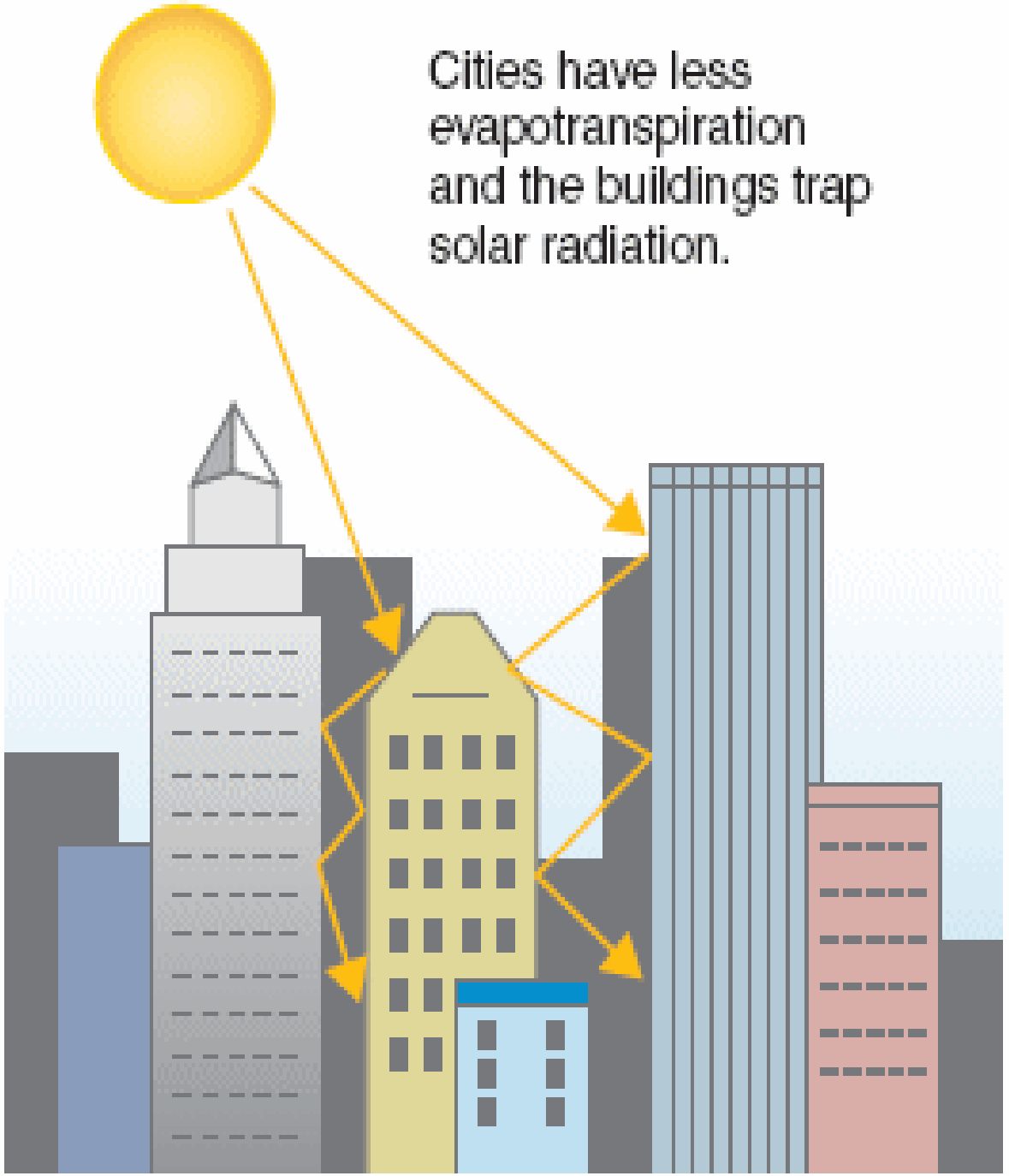


Urban Heat islands

- Physical features such as water areas can have a **cooling effect** on the land. Trees can shade the land, also making it cooler.
- **Human features** such as walls and buildings will **shelter** against the wind, making it warmer.
- Buildings which are heated may also **give out heat (radiate)**, which again makes it warmer than the surrounding landscape.
- Due to human activity, the temperature in an **urban microclimate is higher** than that of the surrounding areas. Urban areas are said to be **urban heat islands** as under calm conditions, temperatures are highest in the built-up city centre and decrease towards the suburbs and countryside.

Why is the man on the left warmer than the man on the right?

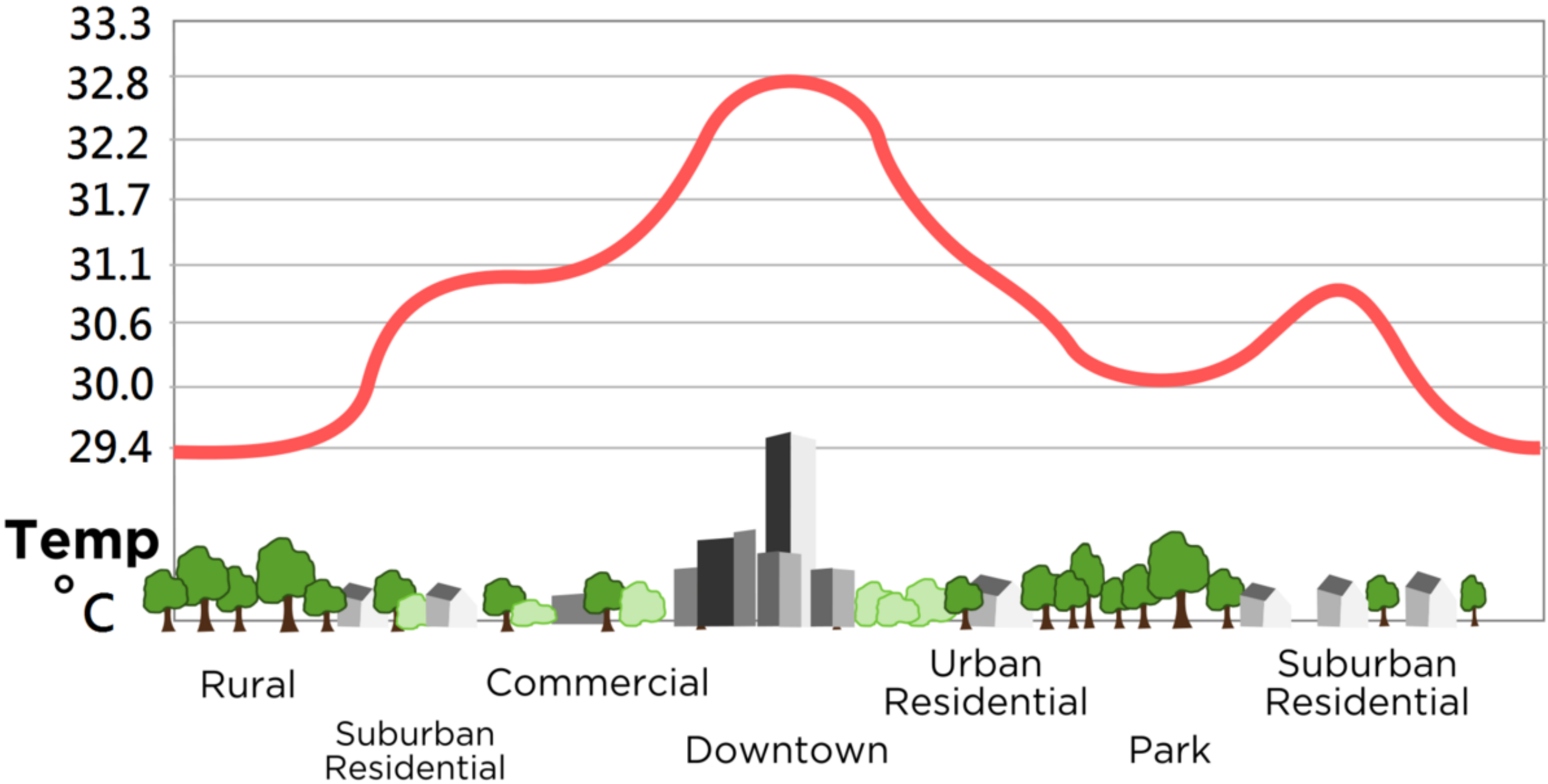

Rural regions have larger evapotranspiration rates and open space reflects solar energy out to space.

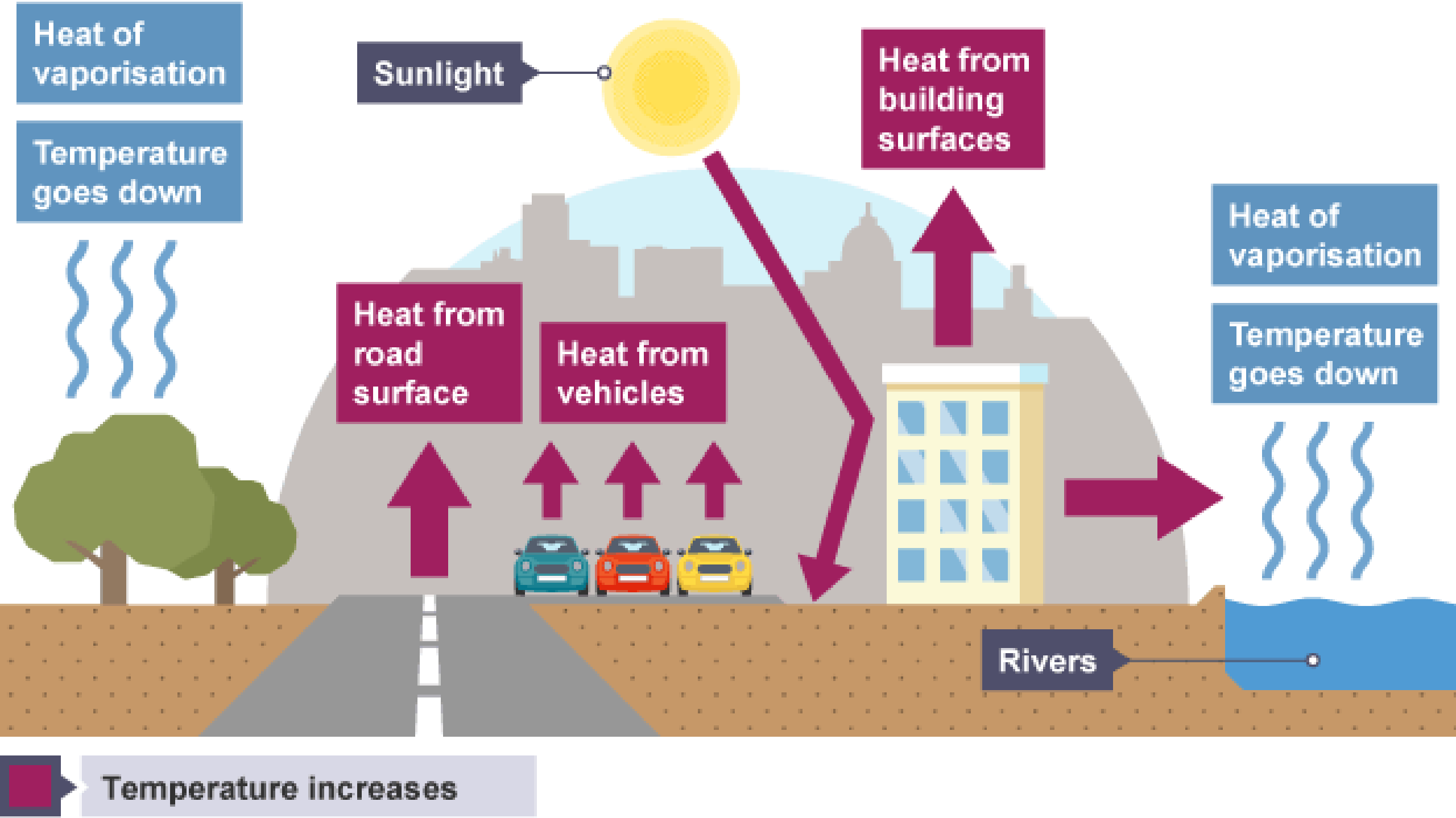

Cities have less evapotranspiration and the buildings trap solar radiation.

Urban Heat islands

- Night time temperatures in UHIs remain high. This is because buildings, sidewalks, and parking lots block heat coming from the ground from rising into the cold night sky. Because the heat is trapped on lower levels, the temperature is warmer.
- Urban heat islands can have worse air and water quality than their rural neighbours. UHIs often have lower air quality because there are more pollutants (waste products from vehicles, industry, and people) being pumped into the air. These pollutants are blocked from scattering and becoming less toxic by the urban landscape: buildings, roads, sidewalks, and parking lots.

URBAN HEAT ISLAND PROFILE




Heat of vaporisation
Temperature goes down
Sunlight
Heat from building surfaces
Heat from road surface
Heat from vehicles
Heat of vaporisation
Temperature goes down
Rivers
Temperature increases

Urban Heat islands

- Water quality also suffers. When warm water from the UHI ends up flowing into local streams, it stresses the native species that have adapted to life in a cooler aquatic environment.
- Scientists are studying how urban heat islands might contribute to global warming, the most recent climate change pattern that includes the gradual warming of the Earth's temperature.
- UHIs contribute to energy demands in the summer, straining energy resources. UHIs are often subject to "rolling blackouts," or power outages. Utility companies start rolling blackouts when they do not have enough energy to meet their customers' demands. The energy used in electric fans and air conditioning ends up contributing to an even hotter UHI.

Urban Heat islands

- Using green roofs, which are roofs of buildings covered in plants, helps cool things down. Plants absorb carbon dioxide, a leading pollutant. They also reduce the heat of the surrounding areas. Using lighter-coloured materials on buildings helps, too. Light colours reflect more sunlight and trap less heat.

Climate of the Maltese islands

- Malta has a Mediterranean climate according to the Köppen climate classification with very mild winters and warm to hot summers. Rain occurs mainly in winter, with summer being generally dry. Malta lies within the subtropical zone, being at 35°N latitude.

Climate of the Maltese islands

TEMPERATURE

- The average yearly temperature is around 23 °C during the day and 16 °C at night (one of the warmest temperature averages in Europe).
- In the coldest month – January – the typical maximum temperature ranges from 12 to 20 °C during the day and the minimum from 6 to 12 °C at night.
- In the warmest month – August – the typical maximum temperature ranges from 28 to 34 °C during the day and the minimum from 20 to 24 °C at night.
- In Malta large fluctuations in temperature are rare.

Climate of the Maltese islands

DAYLIGHT

- Malta enjoys one of the most optimal arrangement of hours of daylight in Europe. Days in winter are not as short as in the northern part of the continent, the average hours of daylight in December, January and February is 10.3 hours.
- The shortest day of the year - 21 December - sunrise is around 7:00 and sunset is around 17:00. The longest day of the year - 21 June - sunrise is around 5:30 and sunset is around 20:30.

Average hours of daylight[6][12]

Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Day	10	10.8	11.9	13	14	14.5	14.3	13.5	12.3	11.2	10.2	9.8
Twilight/Night	14	13.2	12.1	11	10	9.5	9.7	10.5	11.7	12.8	13.8	14.2

Climate of the Maltese islands

SUNSHINE

- As one might expect from Malta's high daylight hours, Malta enjoys around 3,000 hours of sunshine per year (also one of the highest in Europe), from an average of above 5 hours of sunshine per day in December to an average of above 12 hours of sunshine per day in July. Thus, Malta enjoys about twice the amount of sunshine as cities in the northern half of Europe.

(For comparison, London has 1,461 hours per year)

Climate data for Malta [hide]

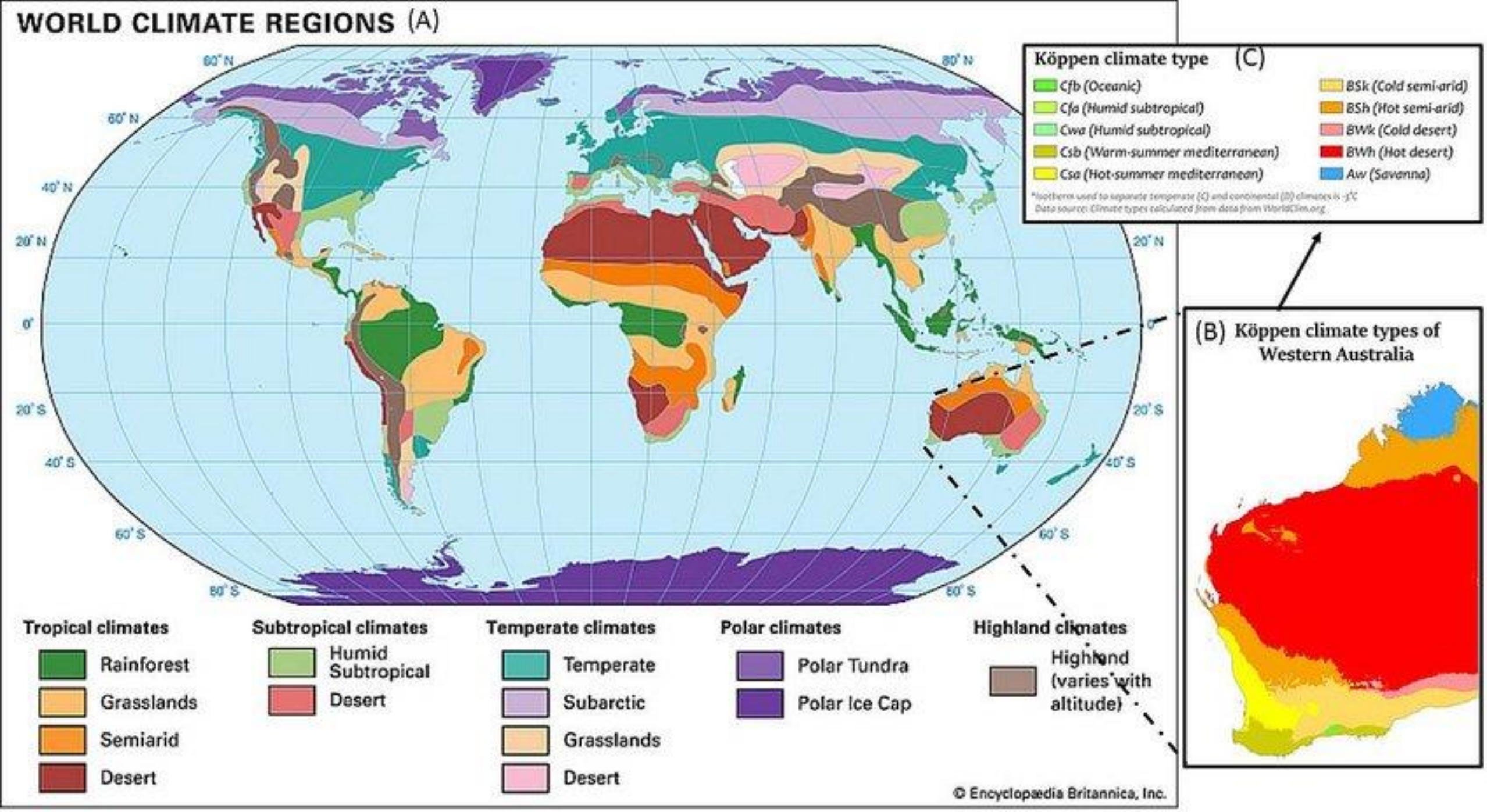
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean monthly sunshine hours	169.3	178.1	227.2	253.8	309.7	336.9	376.7	352.2	270.0	223.8	195.0	161.2	3,054
Mean daily sunshine hours	5.46	6.36	7.33	8.46	9.99	11.23	12.15	11.36	9.00	7.22	6.50	5.20	8.4
Percent possible sunshine	58	62	64	67	72	81	87	88	77	65	62	55	70

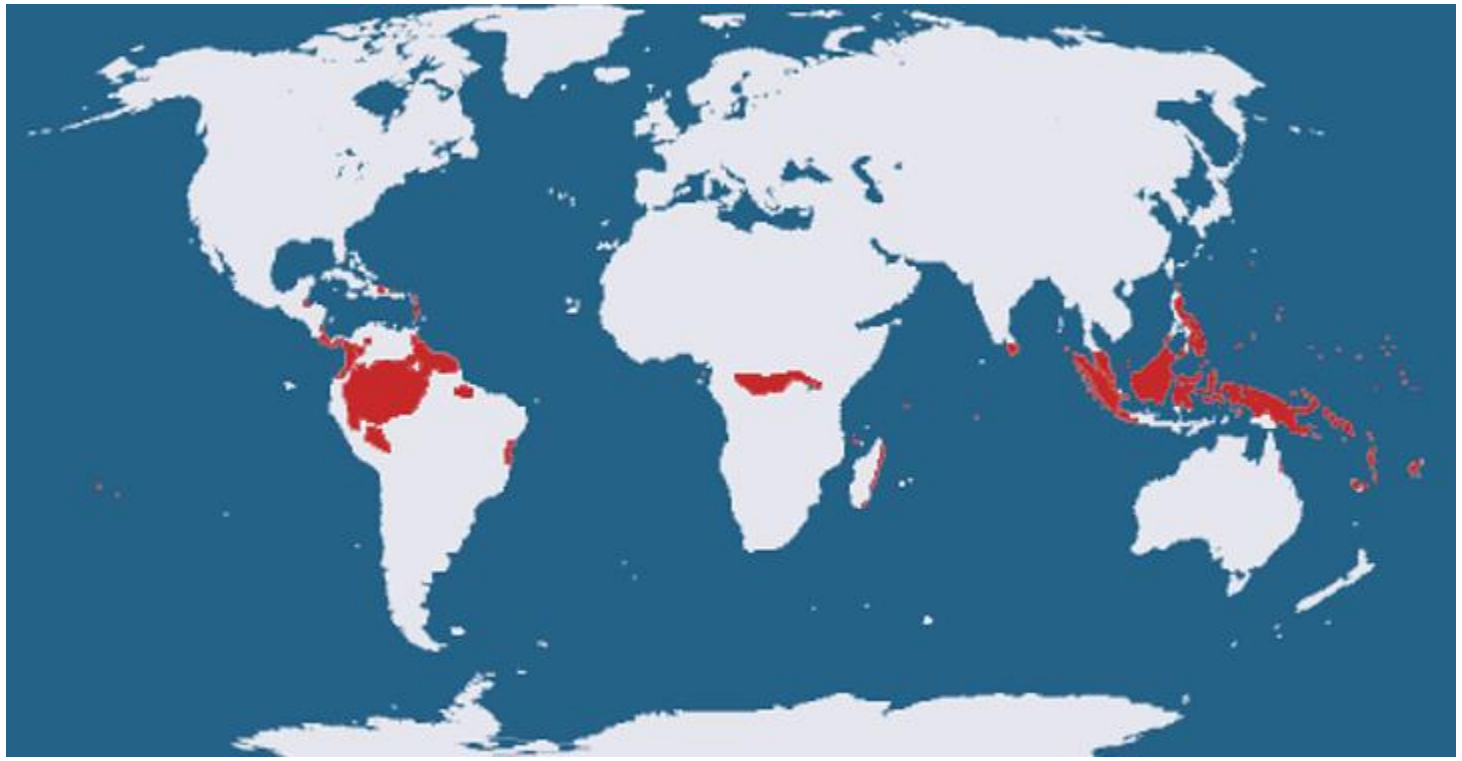
Source: MaltaWeather (Mean daily and monthly sunshine hours),[13] climatemps.com (Percent possible sunshine)[15]

Climate of the Maltese islands

PRECIPITATION

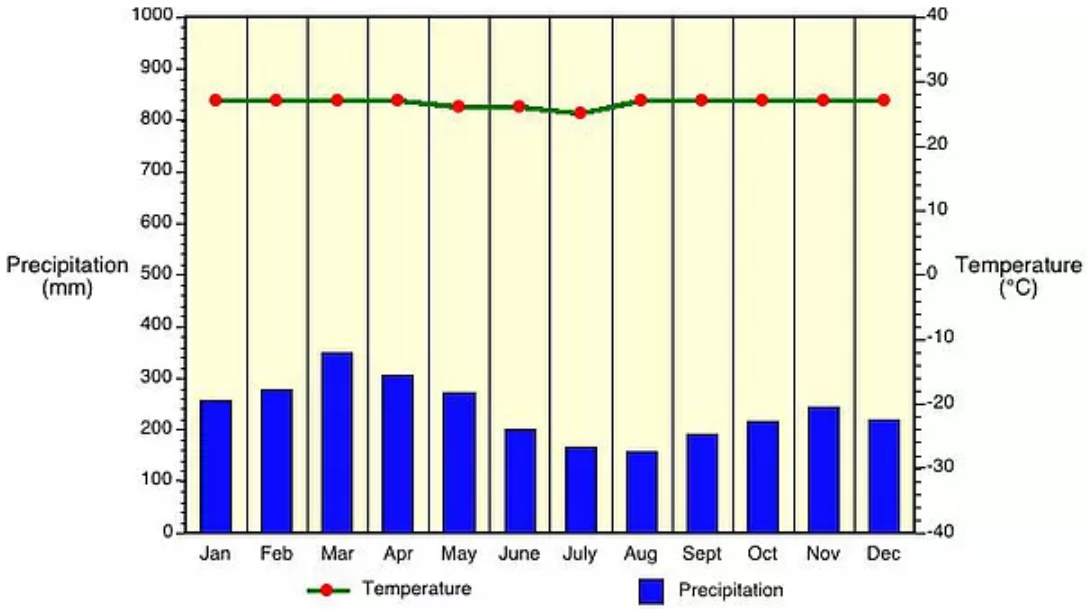
- Water supply poses a problem on Malta, as the summer is both rainless and the time of greatest water use, and the winter rainfall often falls as heavy showers running off to the sea rather than soaking into the ground. Malta depends on underground reserves of fresh water, drawn through a system of water tunnels called the Ta' Kandja galleries, which average about 97 m below surface and extend like the spokes of a wheel. In the galleries in Malta's porous limestone, fresh water lies in a lens upon brine. More than half the potable water of Malta is produced by desalination, which creates further issues of fossil fuel use and pollution.
- Malta has an average of 90 precipitation days a year. The average annual precipitation is around 600 mm, ranging from ≈0.3 mm in July to ≈110 mm in December.

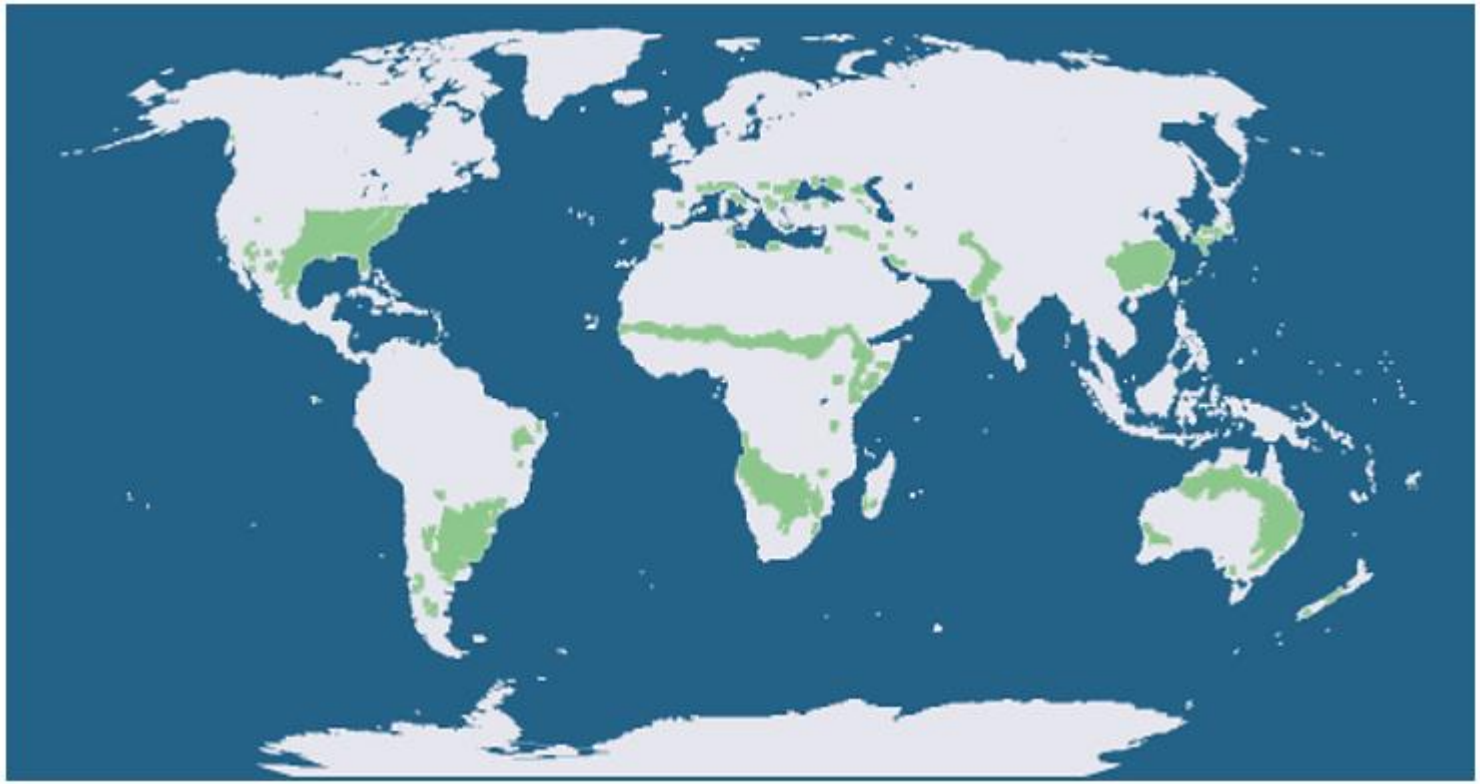

WORLD CLIMATE REGIONS (A)
60° N
40° N
20° N
0°
20° S
40° S
60° S
80° S
Tropical climates
Rainforest
Grasslands
Semiarid
Desert
Subtropical climates
Humid Subtropical
Desert
Temperate climates
Temperate
Subarctic
Grasslands
Desert
Polar climates
Polar Tundra
Polar Ice Cap
Highland climates
Highland (varies with altitude)
© Encyclopædia Britannica, Inc.
Köppen climate type (C)
Cfb (Oceanic)
Cfa (Humid subtropical)
Cwa (Humid subtropical)
Csb (Warm-summer mediterranean)
Csa (Hot-summer mediterranean)
BSk (Cold semi-arid)
BSh (Hot semi-arid)
BWk (Cold desert)
BWh (Hot desert)
Aw (Savanna)
(B) Köppen climate types of Western Australia



Tropical Rainforest

Tropical Wet climate is only found along the Equator. Land along the Equator receives direct sunlight throughout the year. The tilt of the Earth that creates seasons doesn't affect this area because the land along the Equator never tilts away from direct sunlight. This area is known for constant warm temperatures and regular rainfall.



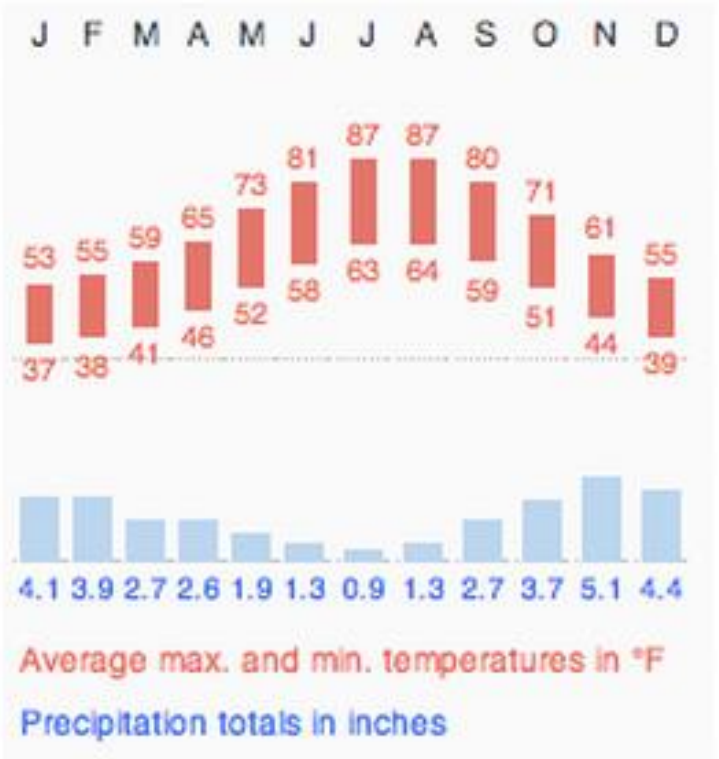


Palm Trees are Evergreens

Humid Subtropical climate is a very pleasant climate. It stays warm throughout the year. Usually Humid Subtropical is found on the east coasts of continents like you see in the map above in the North America, South America, and China. Large storms that form in the ocean such as hurricanes and cyclones often strike these areas due to their position on the east coast. Humid Subtropical climate has a large variety of plant and animal life.

American Alligator

Florida Panther



Mediterranean climate is very pleasant climate with warm, dry summers and cool, mild winters. It gets it's name from the Mediterranean Sea. Most of the coastal land around the Mediterranean Sea experience this climate. This climate's most important cause is the large bodies of water near the land and Mediterranean is only found along the coast.

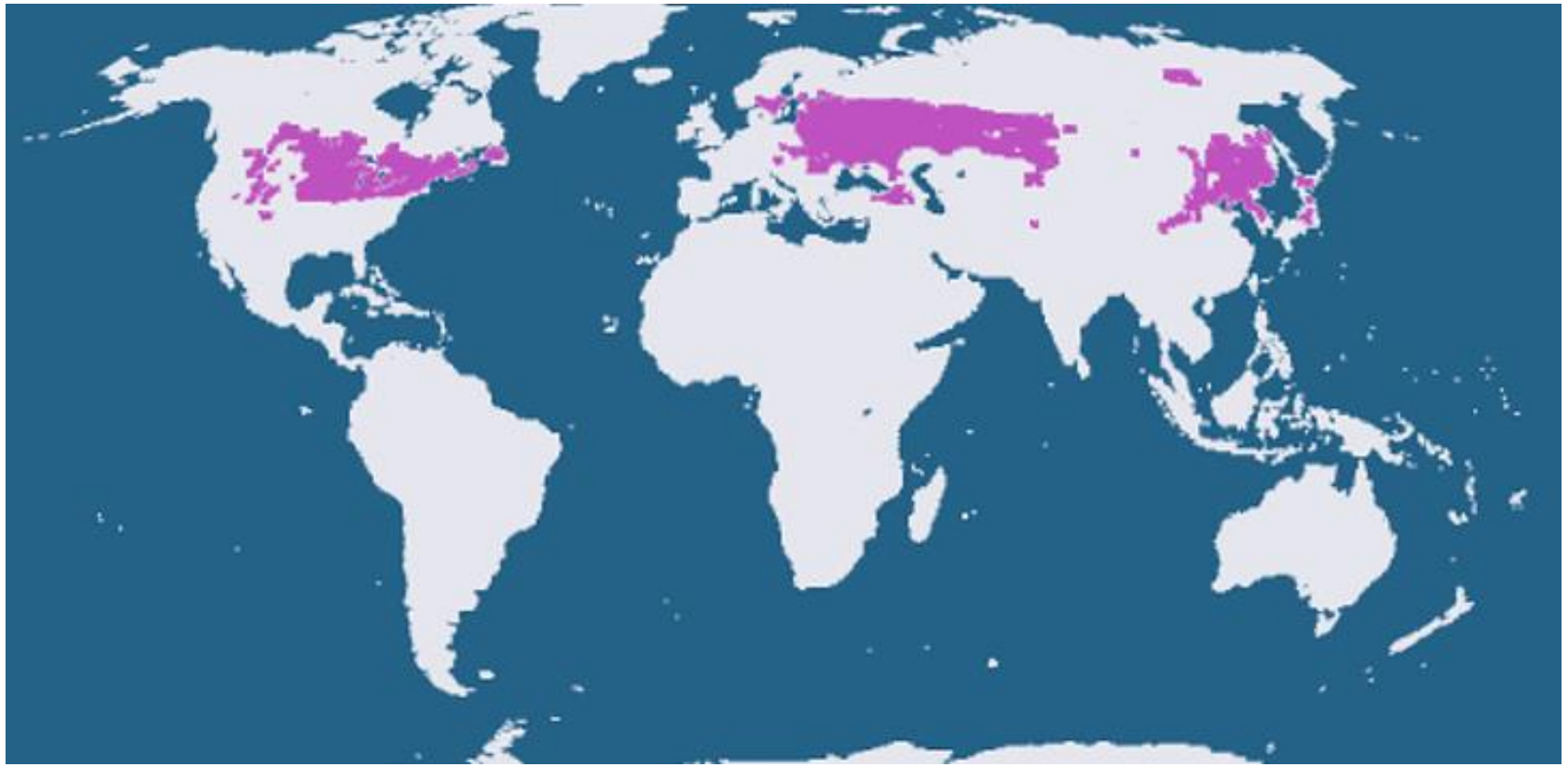
Sage Scrub Bushes

Olive Branch

Marine West Coast climate is found between the Tropics and The Arctic Circle. This is a wet climate and some areas are extremely wet. This precipitation supports amazing vegetation. There would be more of this climate on the map above, but mountains (elevation) prevent the humid air from moving farther inland.

Tallest Living Things on Earth

Redwoods are HUGE

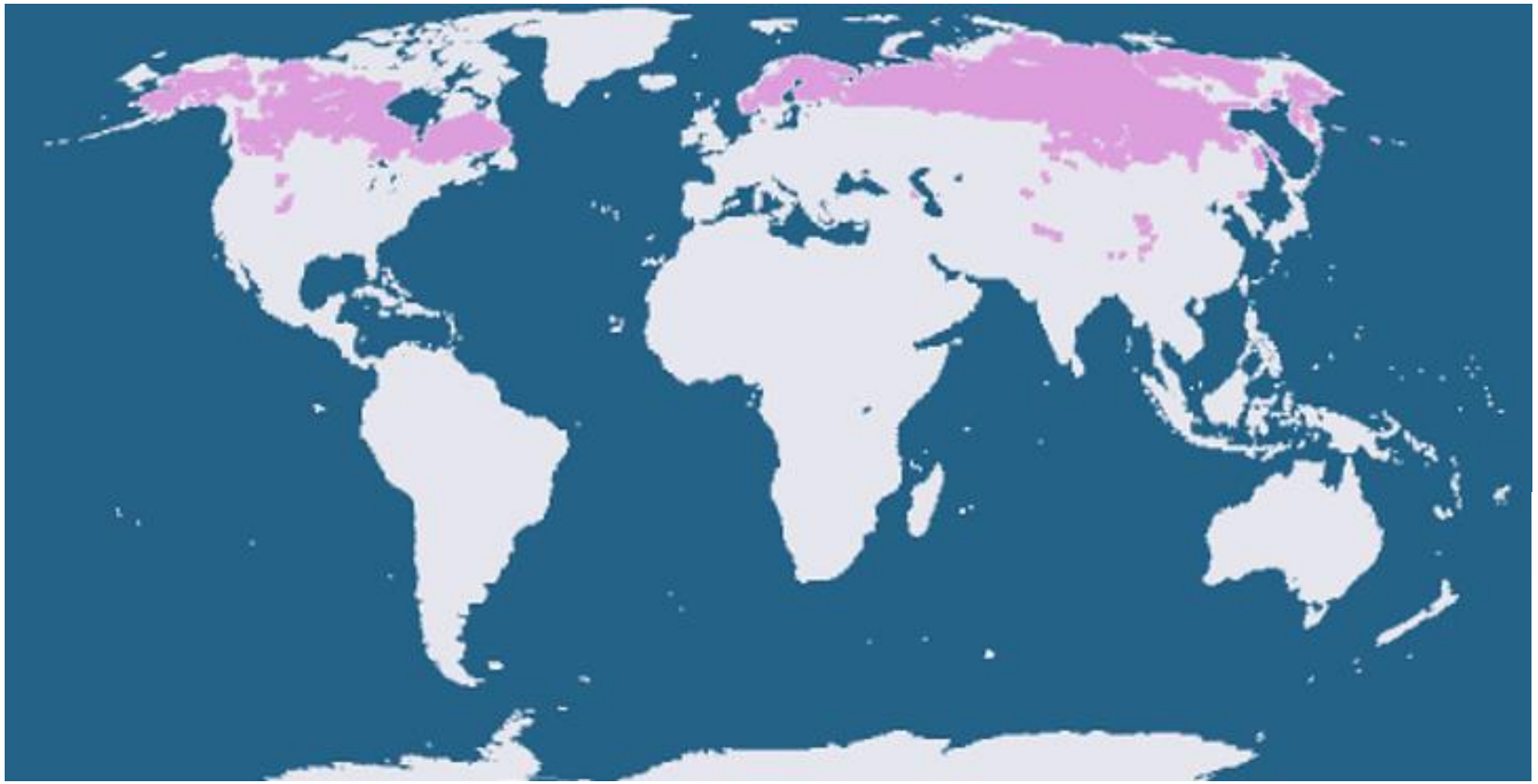


Russian Red Squirrel

Humid Continental climate is mainly found on the interior of continents. This climate experiences four distinct seasons and a very large range of temperatures. Regular rainfall supports a large variety of plants which support a large variety of animals.

mixed forest

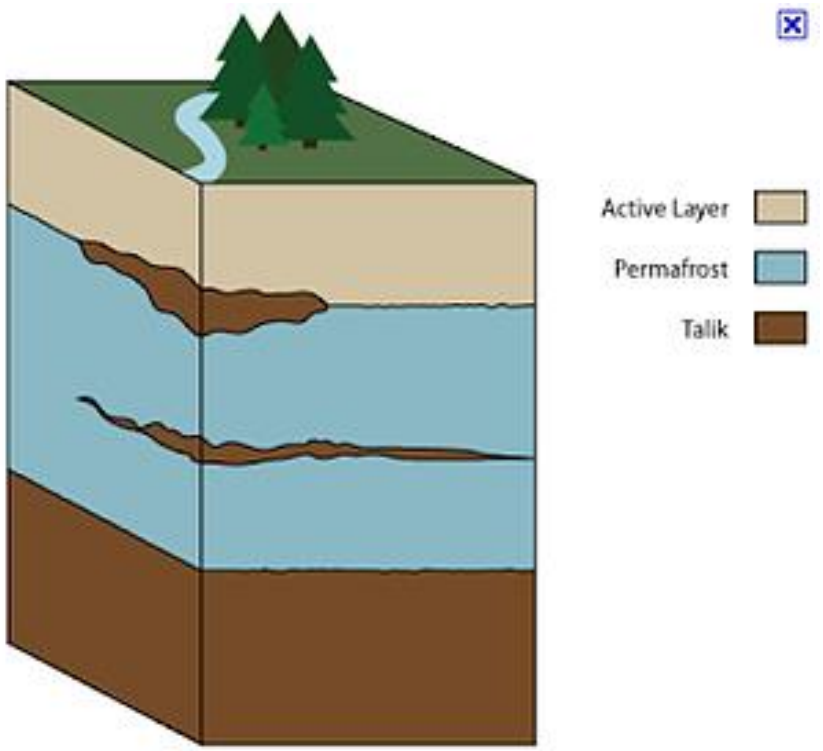
temperate grassland



Subarctic climate is only found in high latitude, inland areas in the Northern Hemisphere. Extreme winters and short, somewhat warm summer create the largest temperature range of any climate. Cold temperatures mean little precipitation here, but enough falls to cover most of the land in snow for much of the year. Despite the harsh climate, several large animals are supported in this climate.

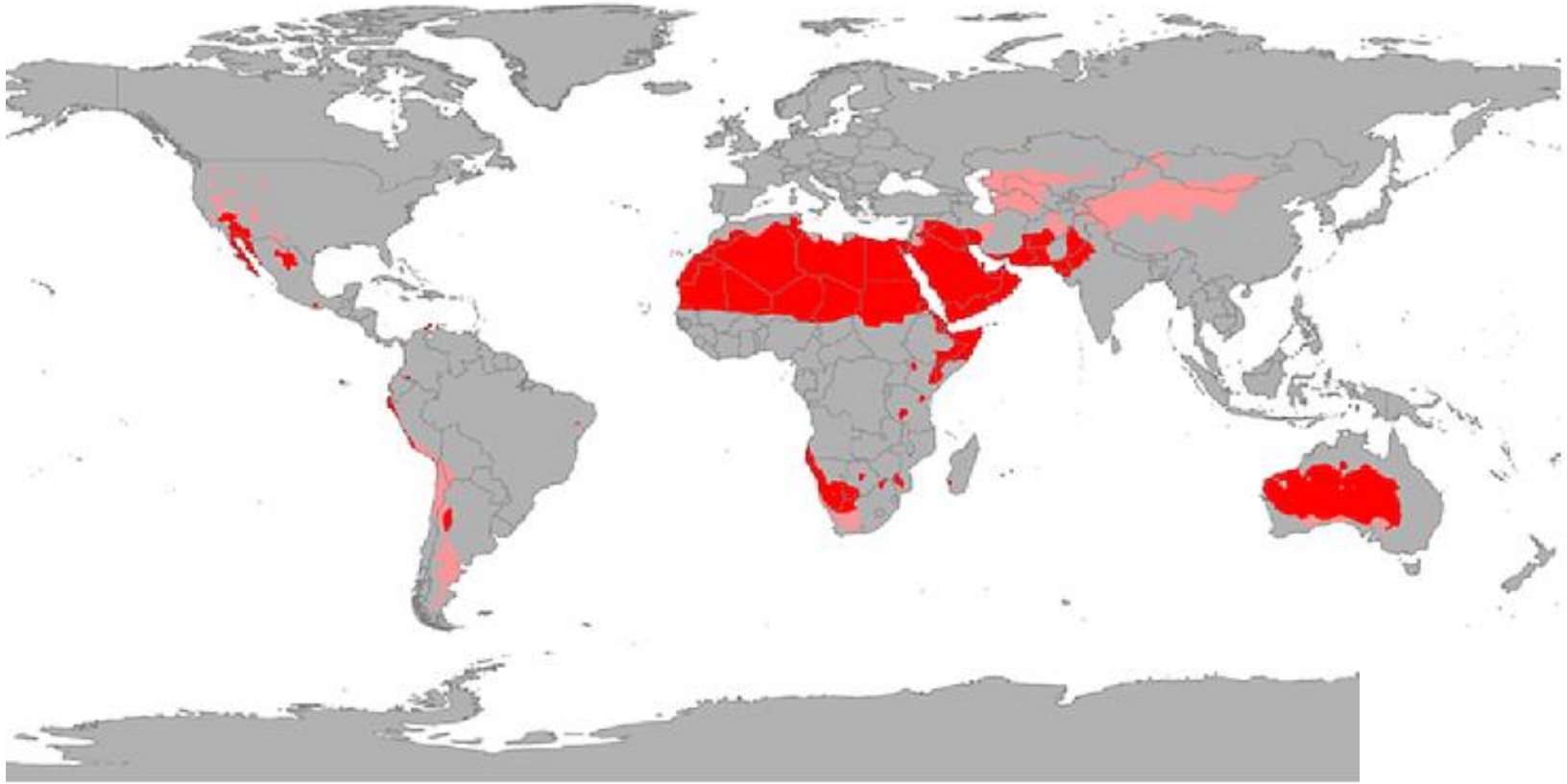
Brown Bear

Conifer trees



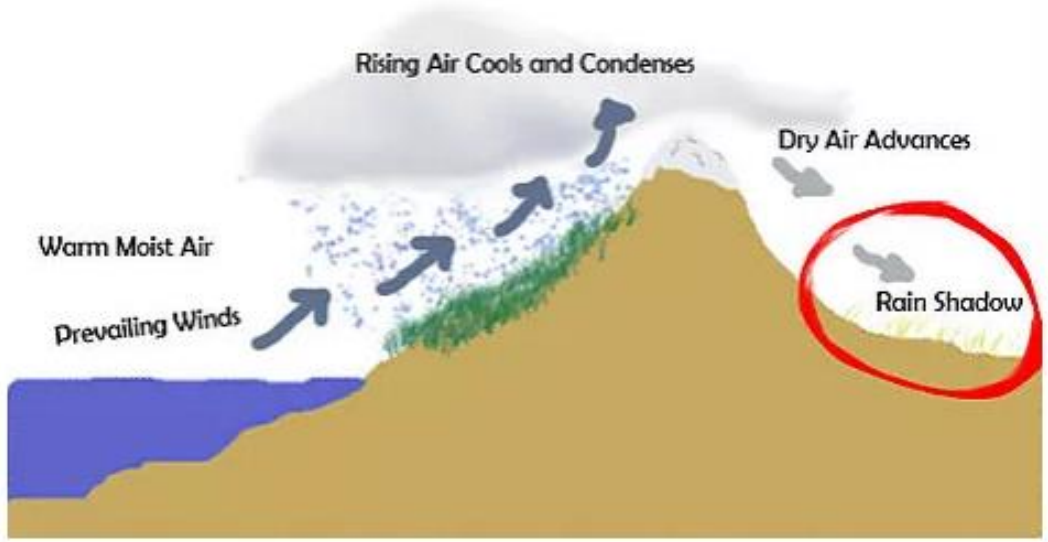
Tundra climate is found along the Arctic Ocean and is an extremely harsh climate during the winter. Summers are cool and never completely melt the soil, creating permafrost. The frozen soil prevents trees from growing and water from draining into the Earth. The water sits at the top and creates bogs and marshes.

Tundra Bog



Atacama Desert

Arid climate is known for being dry, in fact, that is what the word *arid* means. More than a third of the Earth is covered in Arid climate. This climate is mainly found 30 degrees north and south of the Equator due to global wind patterns, but other factors can cause an Arid climate. Despite the lack of water, plants and animals have found ways to survive in this climate.



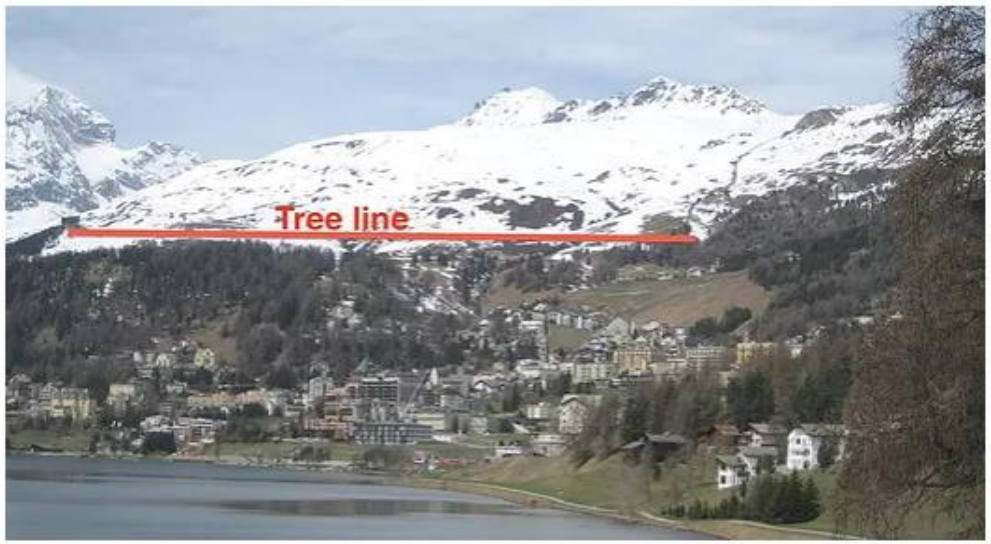
Rainshadow

Sahel of Africa

Semiarid or Semi-Arid means *"somewhat dry"*. Semiarid climate is found around the edges of Arid climate and serves as a transition from Arid to another climate. This is a dry climate that has fluctuating amounts of precipitation, which can often result in drought. Occasional drought can be a very dangerous place for human settlement. Semiarid climate supports more trees and scrub bushes and grasses than Arid and therefore more animals.

Semiarid Scrub

Plateau of Tibet



Tree Line in the Mountains

Highland climate is pretty simple. It is the climate found around high land. High land means mountains. Mountains can have a completely different climate at the bottom compared to the top. Highland climate is often called Alpine Climate. Nearly every part of this climate--temperature, precipitation, etc. depends on the elevation level.