Year 8 Geography Autumn 2 – Glaciations and Polar Regions

Key Word	Meaning
Ablation	When glacial ice melts.
Abrasion	A type of erosion when rocks carried along by the glaciers scrape and smooth the landscape.
Accumulation	When a glacier increases in size due to increased snowfall and less melting.
Alpine glaciers	Glaciers which form on mountainsides and move down slopes through valleys.
Arête	A narrow knife-like edge of land that is created when two corries erode back towards each other.
Climate refugees	people who are forced to leave their homes and communities due to the effects of climate change and global warming
Continental ice sheets	Mass of glacial ice which spread out and cover larger areas.
Corrie	An armchair-shaped hollow found on the side of a mountain.
Deposition	Dropping of materials.
Erosion	Breaking down and removal of materials.
Freeze-thaw weathering	When water freezes and expands in cracks in rock causing it to break apart.
Freezing point	Temperature at which a liquid becomes a solid.
Glaciers	Massive bodies of slowly moving ice
Ice ages	When temperatures are low enough for ice to form glaciers and ice sheets.
Permafrost	A permanently frozen layer on or under Earth's surface.
Plucking	A type of erosion where melt water in the glacier freezes onto rocks, and as the ice moves forward it pulls out large pieces along the rock joints.
Polar regions	The extensive icy regions around the North and South Poles.
Pyramidal Peak	A pointed peak which is left behind when three or more corries erode back towards each other, at the top of a mountain a pointed peak is left behind
Retreat	When glacial melt occurs faster than new seasonal snow and ice have time to accumulate.
Rotational slip	Glacial ice moving in a circular motion.
Snout	The end of a glacier where melting occurs.
Storm surge	Rise or piling-up of water during a storm.
Tarn	A small mountain lake.
The Antarctic Convergence	A line of latitude that circles the globe at approximately 55° South of the equator.
The Arctic Circle	A line of latitude that circles the globe at approximately 66°33’ North of the equator.
The North Pole	The northernmost point on Earth.
Transportation	Movement of eroded materials.
Tundra	Treeless regions found in the Arctic and on the tops of mountains, where the climate is cold and windy, and rainfall is scarce.
Weathering	Breaking down of materials.

Definition and types of glaciers	- Glaciers are mass bodies of slowly moving ice. - They are mainly made of snow, rock and sediment. - Two types of glaciers: 1) alpine glaciers and 2) continental ice sheet and 2)
Formation and movement of glaciers	- If accumulation (the amount of ice gained) is greater than ablation (the amount of ice melt), the amount of ice stored in a glacier increases and the glacier advances. - If the ablation is greater than the accumulation, the glacier reduces in size and retreats.
Glacial processes	- Freeze-thaw weathering - Erosion: plucking and abrasion - Transportation of moraine (rock fragments) - Deposition at snout
Glacial erosional landforms	- Corrie (hollow) - Arête (knife-like edge) - Pyramidal peak (pointed)
Locations and characteristics of polar regions	- Polar regions are the extensive icy regions around the North and South Poles. - Climate: long and cold winter, litter precipitation - Soil: covered in ice or frozen (permafrost) - Plants: not much, moss, algae and lichen - Animals: polar bears in the Artic and penguins in the Antarctic
Impacts of melting polar ice	- Rising sea levels - Animals cannot adapt (Polar bears). - Melting of permafrost (Russia) - New Commercial route (shorter) - Easier access to Arctic resources

Useful Links:

https://www.bbc.co.uk/bitesize/topics/zpcqxnb

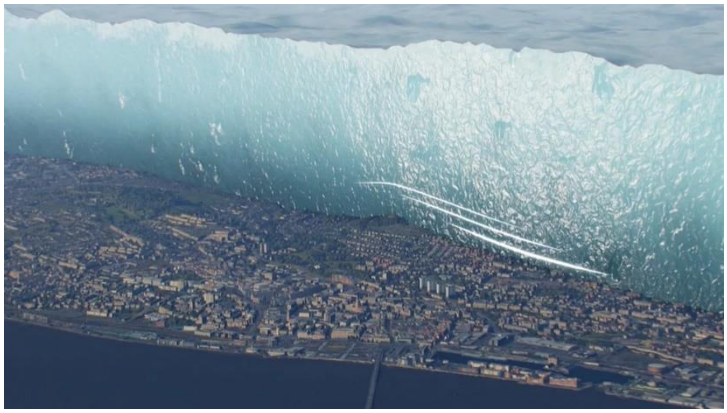
Homework

- Geography homework will be set every two weeks.
- Homework will comprise of:
    - Retrieval questions based on content covered in lessons.
    - Questions based on a news article related to topics in lesson.

<u>Homework 1</u> – Adapted from BBC News, 13 September 2021

How the ice age changed Dundee in Scotland?

A new video shows how the Ice Age, which happened about 20,000 years ago, changed the landscape of Tayside, including Dundee. Back then, a massive sheet of ice covered the area, over 1 kilometre thick. This ice shaped famous places like Dundee Law, a tall hill that overlooks the city today.



The video is part of a project created by a scientist named Max Van Wyk de Vries and an animation teacher named Kieran Duncan from Dundee's Duncan of Jordanstone College of Art and Design. Max originally wanted to use satellite images, but Kieran brought in a storytelling approach. Together, they combined cool visuals, live action, and time-lapse photography to show how the ice changed the land.

They discovered that all of Scotland was under a huge ice sheet that stretched into the North Sea, making it look a lot like present-day Greenland. The video explains that the glaciers, or large ice rivers, moved east toward the ocean, scraping and smoothing the rocks beneath them. This is why Dundee Law and other hills like Balgay Hill have such unique shapes.

When the Ice Age ended, the ice melted away, revealing the hilltops we see today. The flowing ice created a ramp on the east side of Dundee Law, and the melting water formed the River Tay.

Max pointed out that it took only a little bit of warming to change Scotland from a frozen land to the comfortable place we know now. He warned that the same kind of warming could turn Greenland from a giant ice sheet into a land without ice.

The video will be shown on a special website and at an exhibition in the McManus gallery in Dundee. It's an exciting way to learn how our landscape has changed over time and what could happen in the future.

Link of the video: https://www.bbc.co.uk/news/av/uk-scotland-58521146

<u>Homework 2</u> – Adapted from BBC News, 9th May 2024

Venezuela's Last Glacier Disappears

Humboldt peak seen in 2008, before its glacier melted away

Venezuela might be the first country in modern times to lose all its glaciers. Scientists recently found that the last remaining glacier, called the Humboldt (or La Corona), is now too small to be considered a glacier anymore. Instead, it's classified as an ice field.

Over the past century, Venezuela has already lost at least six glaciers. As the planet gets warmer because of climate change, ice is melting faster, which contributes to rising sea levels worldwide.

Dr. Caroline Clason, a scientist who studies glaciers, explained that the Humboldt glacier hasn't had much ice since the early 2000s, and it's no longer growing. Researchers found that it shrank from about 450 hectares (which is really big) to just two hectares (which is tiny).

There isn't a strict rule for how big a glacier must be, but a common guideline is around 10 hectares. Studies have shown that the Humboldt glacier became smaller than that size a few years ago, even though it was still considered a glacier by NASA in 2018.

Scientists define a glacier as a big mass of ice that can change shape under its own weight. If it doesn't do that, it can't be called a glacier anymore. Experts have also noted that it might have been hard to measure the Humboldt glacier recently, which could explain why this information took time to come out.

In December, the Venezuelan government announced a plan to cover the remaining ice with a special blanket to try to slow down the melting. However, some scientists worry this could harm the local environment because the blanket might break down and release plastic.

Losing glaciers is a big deal because they help keep the ground cool. When glaciers disappear, the land can get much warmer, making it harder for new ice to form in the future.

Experts predict that more countries like Indonesia, Mexico, and Slovenia could lose their glaciers soon due to climate change. They explained that warmer areas are expanding, making it harder for snow and ice to last.

Even though losing small glaciers like the Humboldt won't raise sea levels much, they are essential for providing fresh water to people, especially during hot seasons. Once they're gone, communities will have to depend only on rainfall, which can be unpredictable.

Scientists believe that by reducing carbon emissions, we can save some glaciers and help ensure a better future for water and food supplies around the world.

<u>Homework 3</u> – Adapted from BBC News, 17th November 2022

Scientists Warn: Melting Glaciers Could Release Lots of Bacteria

Scientists are saying that as the world's glaciers melt because of climate change, a huge amount of bacteria could be released into our rivers and lakes. This includes some potentially harmful germs.

Researchers from Aberystwyth University studied water from eight glaciers in Europe and North America, plus two in Greenland. They found that melting glaciers could release over 100,000 tons of microbes in the next 80 years. To put that in perspective, that's about as many cells as all the people on Earth!

The team of researchers studied glaciers in Europe, North America and Greenland

Glaciers are giant, slow-moving ice formations that have built up over hundreds or thousands of years. But as the Earth gets warmer, these glaciers are melting faster than ever, causing sea levels to rise. Dr. Arwyn Edwards, a microbiologist, explained that this study is important because it shows just how many tiny living things are found in glaciers.

The amount of microbes released depends on how quickly the glaciers melt, which is linked to how much we continue to warm the planet. The scientists based their predictions on a scenario where temperatures could rise by 2 to 3 degrees Celsius by the year 2100.

As more bacteria flow into our water bodies, it could change the water quality in significant ways. However, Dr. Edwards warns that this effect might only last for a few decades because once the glaciers are gone, the bacteria will stop flowing.

He pointed out that there are about 200,000 important areas that get their water from glaciers. Some of these places are delicate ecosystems, while others support millions of people who rely on that water for their livelihoods.

Dr. Edwards emphasized that glaciers aren't just frozen water; they're also homes for many different kinds of microorganisms, some of which could be harmful to humans. While the risk is low, he says we need to study it carefully.

Dr. Tristram Irvine-Fynn, a glaciologist, mentioned that we need to learn more about how these ecosystems work as the glaciers continue to melt. Understanding this better can help us predict the effects of climate change on these important icy areas.