



Climate Change in Arctic

Subjects

Geography Earth Science

Topics

Geography Water Cycle

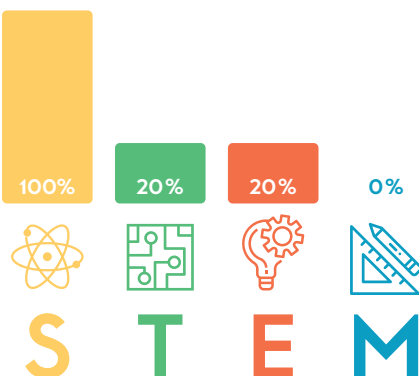
Key Words

Climate Change Global Warming Water Cycle

Connection to SDG



STEM Chart



Time for Activity

5–10
minutes

Introduction

Considering that 70% of our planet is covered by water, oceans play an important role for our planet. Besides that, oceans also absorb much more energy (heat and light) than our atmosphere and our land. The oceans can disperse the heat around the planet. The warm surface water that comes from Gulf Stream/Equator carries heat to the poles, where it cools and sinks and returns towards the equator. This movement of heat and energy affects the climate and is also affected BY THE CLIMATE. This conveyor belt – this system of large ocean currents influences the nature of our summers and winters, our wet seasons and dry seasons.

The water cycle that starts from tropical areas where the warm surface water is less dense. This means it floats on top of the ocean, capturing more light and heat becoming even warmer. Water at the poles becomes cool, and dense, and sinks down, drawing the warmer waters up from the equator. This enormous cycle can take the water 1000's of years to complete, and is an essential part of our climate system. As the planet warms, these circulations can be altered or even stopped. Uncertain weather such as extreme heat in tropical areas and freezing cold in surrounding poles areas are the results of climate change issue. Another living being as such animals who are living in particular areas will get the impact if their habitats are threatened by climate change.

Key Objectives

- 1 The activity is related to climate change and the process of global warming. The cause of global warming issue and the impact to our planet and another living being that lives on the earth. One of the cause of global warming is massive using of fossil fuel. Several countries still rely on fossil fuel such as Indonesia that still uses this non-renewable resource. The uncontrollable use of fossil fuel is impacting our planet through the acceleration of global warming – emphasizing the importance of reducing our energy consumption in our households.
- 2 Furthermore, through this activity the process of the water cycle itself is shown so that students could gain some insights to the mechanisms of climate change and raise awareness of the fact that this issue is real. Moreover, the facilitator can also give the students some advices how to contribute to tackling this issue by simple actions such as turning off air conditioners,



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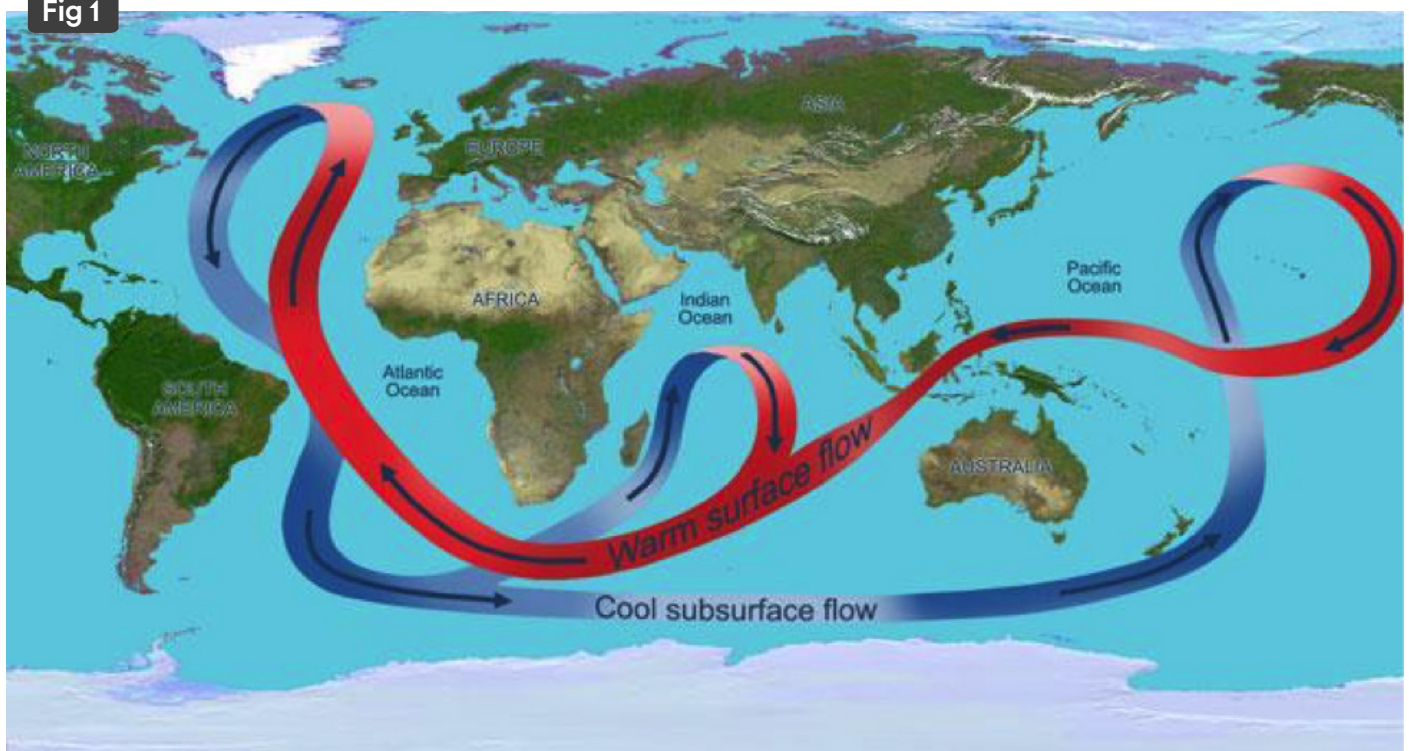
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if they do not use it, turn off lights during the day, unplug their devices if they are doing another activity, using public transportation, reducing single use plastic that mostly end up in the ocean, and so on.

Fig 1**Source**

<https://www.jpl.nasa.gov/news/news.php?release=2010-101>

Guiding Questions

- 1 How to make a miniature model that could show the water cycle process from shallow warm water to deep cold water by using all the materials that you have already prepared at home within five minutes.

Materials

- 1 Transparent box
- 2 Hairdryer/straw
- 3 Food colorings
- 4 Ice cubes
- 5 Warm water



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Tasks

- 1 Fill the box with cold water (represent of the ocean)
- 2 Add few drops of food coloring to one corner of the box
- 3 The students will see the diffusion of the color randomly. Discuss the science behind it.
- 4 Cold water molecules move more slowly, so food coloring moves more slowly and takes longer to spread freely.
- 5 Pour warm water to one corner of the box and add ice cubes to another another corner OR place a cup or glass partly filled with warm water in one corner, and one cup/glass with ice in it in the other – this will avoid the “ocean” being disturbed by the pouring – and the movement will be due more to the heating and cooling effects.
- 6 The students just make the miniature of Gulf Stream, they will observe the cycle through the food coloring.
- 7 Use hairdryer in order to create warm air. The hairdryer will represent wind, that plays important role to make the movement of the surface currents.

Fostering Discussion

- 1 Observe what is happening with the food coloring that could show the cycle in our planet.
- 2 What affects the movement from cold water to shallow warm water area?
- 3 What affects the movement from shallow warm water area to cold water?
- 4 Is the movement in each area the same or does it move randomly?
- 5 Does it move only at surface level or does it have an impact on the deeper water?

Safety

- 1 For students who are still in primary school, they could ask help to their parents to pouring the warm water into the container.



Possible Extensions

Try larger oceans, deeper oceans, explore what happens if the bottom of the ocean is not flat (make mountains and shallow areas under the water).