

Sea Level Rise



FILM

- ▶ **GUB Explorer Channel - Experiment with Ice**
- ▶ **Anthropocene - The Rise of Humans: Water**
- ▶ **On Thin Ice**
- ▶ **Dandelion: The Ecological Footprint**

KEY OBJECTIVES

- 1 **Differentiate glaciers and ice sheets**
- 2 **Identify what really contributes to global sea level rise**
- 3 **Determine the role of temperature in sea level rise**

INTRODUCTION

Ice acts as protective layer on the surface of the Earth by helping in reflecting UV rays back into the space, therefore aiding in maintaining the planet cool. One type of ice found in the polar regions are called glaciers that have existed from hundred to thousand years. It helps scientists have a glimpse on records of climate and how it has changed over the years. Other types of ice can be found in Figure 1. From the 1900s, most of the glaciers had rapidly melted. Anthropogenic impacts are the main cause for the increase in the amount of greenhouse gases in the atmosphere. These greenhouse gases cause increase in global temperature that leads to global warming.

As a result of sea level rise, coastline faces erosion and inundation. Coastal inundation is when sea water levels become high and results to flooding, affecting coastal communities. Inundation and erosion are important aspects of disaster risk management programs especially when these coastal communities are exposed to risks brought about by climate change. Moreover, movement of sea water landwards may infiltrate aquifers or groundwater sources that are used by communities in the area.

TOPICS

Sea-level changes climate change
global warming cryosphere
hydrosphere

KEYWORDS

Glaciers ice caps sea level rise
climate change global warming

LEVEL

Primary School Secondary School

RESOURCE TYPE

Experiment Demonstration

INTENDED AUDIENCE SIZE

Experiment can be done individually

MODE OF DELIVERY

Small group live online

TIME FOR ACTIVITY

30-60 min.

Sea Level Rise



Knowledge
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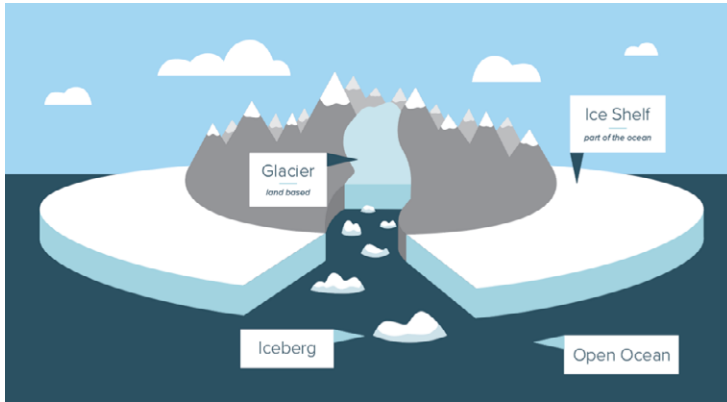


Figure 1.
Different types of ice from the polar regions

GUIDING QUESTIONS

- What difference/s do glaciers and ice sheets have? Which one affects sea level rise? Explain.
- How does increasing temperature affects ice and ice formation?
- What are the effects of melting ice in the global water circulation?

MATERIALS/PREPARATION

- Glass container of 2 sizes (the smaller one should fit inside the larger glass) *Learners can use clear drinking glass for the experiment
- Markers
- Timer
- Water
- Ice
- Electric kettle
- Recording notebook

TASKS/PROCEDURE

EXPERIMENT TRIAL 1:

- 1 Get a clear glass container (clear drinking glass may be used) and half fill it with room temperature tap water. See (1) at Part 1 below.
- 2 Place ice cubes in your glass. (See 2) below.
- 3 Carefully mark the level of water (3).
- 4 Using a timer, record the time it takes for the ice to melt.
- 5 Record observations if there are changes in the initial level of the water.

Sea Level Rise

Part 1:



(1)

(2)

(3)

EXPERIMENT TRIAL 2:

- 1 Get the smaller container or any material that will fit inside the larger glass (1).
- 2 Place the smaller container inside. This will serve as your "landmass" (2).
- 3 Fill the larger container with water. Make sure water level will not submerge the smaller container (3).
- 4 Place ice cubes on top of your "landmass" (4).
- 5 Mark the level of water at the start of your observation (5). Record the time it takes for the ice to melt. Record observations if there are changes in the water level after all the ice melted.



(1)

(2)

(3)

(4)

(5)

Additional Activity:

Repeat trial experiments 1 and 2. This time, make use of a warmer water than the room temperature tap water. Observe changes in the time it takes to melt the ice.

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FOSTERING DISCUSSIONS

The facilitator can discuss first the concept of climate change and global warming. Relate it to how ice forms/ melts. Discuss the importance of ice sheets and glaciers in terms of making the planet cool and further identify the difference between the 2 types of ice. Moreover, identify the consequence if ice melting and its effect to the global circulation pattern of water, and global climate.

Facilitators can also ask what practices should be done in order to slow down the melting of ice in polar regions. In this case, how to reduce carbon footprint and greenhouse gas emissions.

SAFETY INSTRUCTIONS

- 1 **Careful in handling containers especially if this experiment to be conducted using glass materials.**
- 2 **Caution in warming the water. DO NOT USE BOILING WATER in this experiment.**

AUTHORS AND SOURCES

Submitted by John Kristoffer Q. Andres (Philippines)

This activity is modified from: