



## Why talk about Glaciers?



Rivers of ice. Great walls of frozen snow that move—moulding and shaping the land as they go. Glaciers are certainly one of the most spectacular visions that our planet features. And pretty daunting to think of, too.

Specially now—in peak winter!

Yes, glaciers are powerful.

But they are also vulnerable to conditions like changes in climate. How? Well, build up of greenhouse gases (GHGs) like carbon dioxide, and methane heat up the Earth like a garden green house. The surface temperature rises and glaciers melt as a result of the rising heat.

Maybe you are asking yourself, why should I care about that? You should. Because glaciers play a vital role in our lives. Let's find out how closely they are linked to us!

Name.....

School Name .....

Class..... Date.....

### Gobar Gyan

Glaciers cover 10 per cent of the world's land area but store about 75 per cent of its freshwater! As they need some specific climatic conditions to exist, they are mainly concentrated in regions above the snow line i.e. mountainous areas or the polar regions.

Because glaciers are so sensitive to changes in temperature, they are used as barometers by scientists to study climatic conditions of the past ages. And to find vital clues to what may happen in the future. Absolutely fascinating, right? The bad news is, they paint a horribly alarming picture for Planet Earth. Since the early twentieth century, with few exceptions, glaciers around the world have been retreating at an unprecedented pace. In fact, some ice caps, glaciers and even an ice shelf have disappeared altogether in this century. The situation is getting grimmer, with the mass balance of snow in the Himalayan glaciers reaching a particularly precarious state. Their snowline, too, is shifting steadily backwards. For example, the 25 km long Gangotri glacier, which is the source of the holy river Ganga, is retreating by more than 16.5 metres every year.



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The glaciers, as they melt, are also breaking up. And the smaller fragments--that replace the big ones--are larger in number but carry far less volume of water.



### Activity 1: Go glacier hunting!

- Do you live near a river? Track its original source. Is it also fed by melted glacier water?
- Do all rivers originate from glaciers? Get hold of India's river map and find out which of them flow out of glaciers and mark them with a red-inked pen.

### Activity 2

Get to know your glaciers better. Answer the questions below and find them in the crossword.

- The study or science of glaciers is referred to as: \_\_\_\_\_
- A glacier forms with the accumulation of \_\_\_\_\_ over time:
- The process of glacier growth and establishment is: \_\_\_\_\_
- The two common type of glaciers are continental ice sheets and: \_\_\_\_\_
- The largest glaciers: \_\_\_\_\_
- Glaciers that terminate in the sea: \_\_\_\_\_
- A large piece of ice from freshwater that has broken off from a snow-formed glacier and is floating in open water: \_\_\_\_\_
- The only continent where no glaciers can be found: \_\_\_\_\_
- The planet other than earth which exhibits glacial features: \_\_\_\_\_
- If all land ice melted, sea level would rise approximately \_\_\_\_\_ meters worldwide.
- The second longest glacier outside of the polar regions and largest in the Himalayas-Karakoram region: \_\_\_\_\_
- The most important factor causing glacial retreat and glacial loss: \_\_\_\_\_
- A geological period of long-term reduction in the temperature of the Earth's surface and atmosphere, resulting in an expansion of glaciers:  
\_\_\_\_\_
- The glacier river Ganga originates from:  
\_\_\_\_\_
- The two major consequences of melting glaciers:  
\_\_\_\_\_



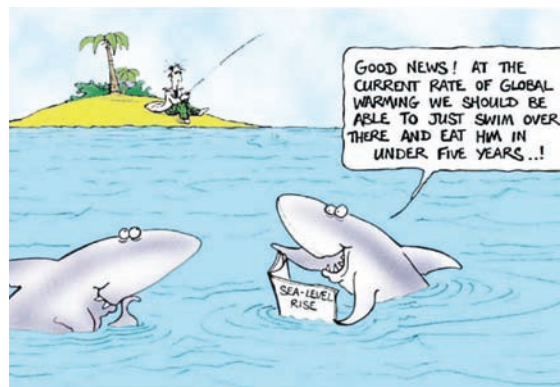
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### The glacier alert!

- With Himalayan glaciers continuing to melt, in the short-term there will be an increase in river discharge which will cause flooding in adjacent areas. But in a few decades, the water level of the rivers will decline to a permanent reduced level.
- The Himalayan glaciers are the source of water for rivers that flow across Indo-Gangetic plains. So the lives and livelihoods of the 500 million people who dwell here are completely dependant on these ice masses.
- The economy will suffer from this loss of water as industries like food and steel depend on the availability of water.
- The production of electricity through hydropower that depends on glacier-fed rivers, may suffer a setback.
- Glacier melt, especially at the poles, has contributed as much as 30 per cent of sea level change in the 20th century. A new report of the Scientific Committee on Antarctic Research (SCAR) suspects that sea level could rise upto 1.4 metres till the end of the century. This is a danger signal for the people living in coastal areas. In India it is likely affect coastal cities like Mumbai, Chennai or Kolkatta, quite severely. Low lying islands like the Maldives would go completely under the sea.
- Glaciers absorb a little amount of heat, reflecting most of it back into space. If they disappear completely, the earth below is dangerously exposed. It will now absorb most of the heat, reflecting back just a small amount. This will cause the earth to heat up even more. And the heightened temperature will hasten the melting of the the remaining glaciers. A vicious cycle indeed!



"Everybody always talks about glaciers, but nobody ever does anything about them!"



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