

# Global Warming

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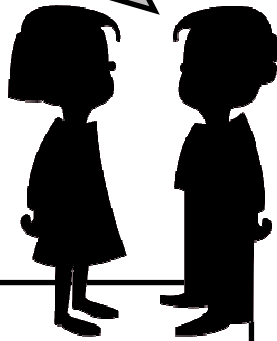
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Level

## Big Idea

Global warming is causing ocean temperatures to increase and icebergs to melt.

The activity is aimed at this level but can be modified to suit other levels.



## What you need to know

- The greenhouse effect or global warming affects air temperature, weather and ocean temperature.
- The sun's energy is absorbed by the atmosphere and the ocean.
- As water warms up it expands and takes up more space.
- Therefore if ocean temperatures rise there will be a rise in ocean levels.
- Global warming is causing icebergs to melt faster.
- Many people think that if a floating iceberg melts the ocean level will rise a lot. This is incorrect.
- As water freezes, it expands. It still weighs the same, but it takes up more space.
- As an iceberg floats, the part of the ice that is underwater takes up exactly as much space it would when it was liquid water. When it melts, it will take up that amount of space again so ocean levels will stay nearly the same.

## Learning Intentions

- ✓ We are learning about the effects global warming has on ocean levels.

## Success Criteria

- ✓ I can explain the affect that rising ocean temperatures have on ocean levels.
- ✓ I can explain the affect melting icebergs have on ocean levels.

## Other Resources

### Building Science Concepts

Ice (Level1/2)

### Connected

The Ozone Hole (Number 3, 2008)

Creeping Along (Number 2, 2005)

### School Journals

Global Warming – a new battle for Kiribati (Part 4, Number 1, 2002)

## Curriculum Links

### Nature of Science

Understanding about science – Appreciate that science is a way of explaining the world and that science knowledge changes over time. (L3/4)

Identify ways in which scientists work together and provide evidence to support their ideas. (L3/4)

### Planet Earth and Beyond

Earth systems – Appreciate that water, air, rocks and soil, and life forms make up our planet and recognise that these are also Earth's resources. (L3/4)

### Key Competencies

Participating and contributing – Use their scientific knowledge of issues to make decisions about possible actions they could take.

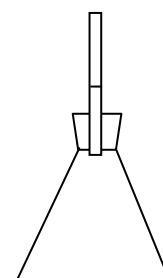
## What you need

- Flask or clear plastic drink bottle
- Stopper – with hole through the middle for tube
- Glass tube
- Food colouring
- Marker pen
- Bowl or container of water
- Ice cubes (10 – 12)
- Marker pen

## What to do

### Part 1 – Will global warming cause the oceans to rise?

1. Fill the flask almost to the top with water and a drop of food colouring.
2. Put in the stopper and tube. Press down firmly.
3. Water should rise up the tube. When it has stopped rising mark the level on the tube with a marker pen.
4. Put the flask out in the sun.
5. **Predict** – What do you think will happen to the water?
6. After 10 minutes look at the tube to see what has happened.
7. How far up the tube is the water level now? Mark the new level.
8. **Explain** – Why has the water moved up the tube?



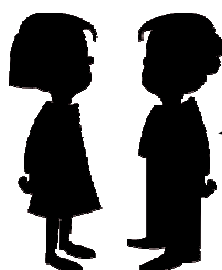
### Part 2 – How much extra water is produced when ice melts?

What would happen if the global temperature increased enough for much of the polar ice-caps to melt? All that extra water would cause world wide flooding right? Let's investigate.

1. Fill the bowl  $\frac{3}{4}$  full with water.
2. Add 10 – 12 ice cubes.
3. Mark the side of the container with a marker pen to show the level of the water.
4. Let the ice cubes melt.
5. **Predict** – What do you think will happen?
6. Once the ice cubes have melted check to see whether the height of the water changed. Mark the new level.
7. **Explain** – Can you explain what has happened? Was there as much change as you expected?

Why are people worried about ice melting? What ice would cause a problem if it melted? (Ice on the land – glaciers, snow)

What problems might arise if ocean levels rise?



### What's Next?

Investigate things you can do to help stop global warming.

Try melting ice in salt water. Does it melt more quickly than in fresh water?