

EXPERIMENT SCENARIO

ARCTIC ISSUES: THE CHANGING ARCTIC

EXPERIMENT 1: HOW DOES SEA ICE IMPACT THE RATE OF OCEAN'S WARMING?



For the experiment you will need:

2 empty plastic or glass containers of the same size (e.g. empty ice cream boxes)	One glass	Ice-cube tray
2 thermometers	Desk lamp with a bulb (or two lamps with bulbs of the same power)	Water and access to freezer

1. Pour water into a cup and mark the level. Then, pour water into ice-cube tray and put into the freezer.
2. Pour the same volume of water into the cup (up to the same level as for the first time). Pour water to one of the containers and put into the freezer in order to obtain a thin ice block.
3. Let water in ice-cube tray and in the container freeze. Take ice cubes and ice block from the container.
4. Pour the same amount of water (of the same temperature) into both containers (e.g. 0.5 litre). Put one thermometer into each container.
5. Put all ice cubes into the first container and the thin ice block into the second one. Make sure that there is enough water for ice to float.
6. Place the containers directly under the lamp. Make sure that the containers are placed in such a way that both are heated by the lamp equally. If you have two lamp with bulbs of the same power place each lamp centrally above the container.
7. Start the stopwatch and make regular measurements of temperature of the water.
8. If your containers are transparent, you may read the temperature from thermometers. If necessary, you may take out the ice block for a while in order to check temperature of water. Write down your observations (time + temperature).
9. Repeat the procedure in regular time slots until ice in one of the containers is totally melted.



Observation sheet

Time	Temperature of water in the container with ice cubes	Temperature of water in the container with ice block	Difference

Conclusions

<i>Is the temperature of water the same in both containers? Why?</i>	
<i>In which container the melting rate is higher? Why?</i>	
<i>Think what is the difference between the Arctic Ocean covered with sea ice on the surface (similar to the thin ice block) and open water with icebergs (similar to ice cubes).</i>	