

Arctic Climate Change

Less snow and ice: a warmer world?

You will need:

A thermometer
Cotton wool
Kitchen foil

A lamp / heat source
A black surface
Leaves, twigs, seedlings

1a) Does SNOW reflect or absorb heat?

Take the cotton wool – this represents **SNOW**.

Put the 'snow' under the lamp for 30 seconds.

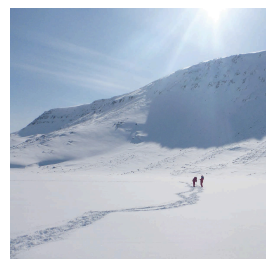
Put the thermometer under the 'snow' and measure the temperature.

Write the temperature down.

Now place the leaves and twigs etc over the 'snow'. The leaves and twigs represent plants and other vegetation.

Leave for another 30 seconds then measure the temperature again.

Write the new temperature down. It is **hotter, colder, or the same?**



1b) Does SOIL reflect or absorb heat?

Repeat the experiment above but this time using the black surface. This represents **SOIL**.

Take the temperature with and without the 'vegetation' on top of the 'soil' and record the temperature each time.

Is the temperature **hotter, colder, or the same** with the leaves and twigs on top?



1c) Does ICE reflect or absorb heat?

Repeat the experiment for a third time using the kitchen foil. This represents **ICE**.

Take the temperature with and without the 'vegetation' on top of the 'ice' and record the temperature each time.

Is the temperature **hotter, colder, or the same** with the leaves and twigs on top?

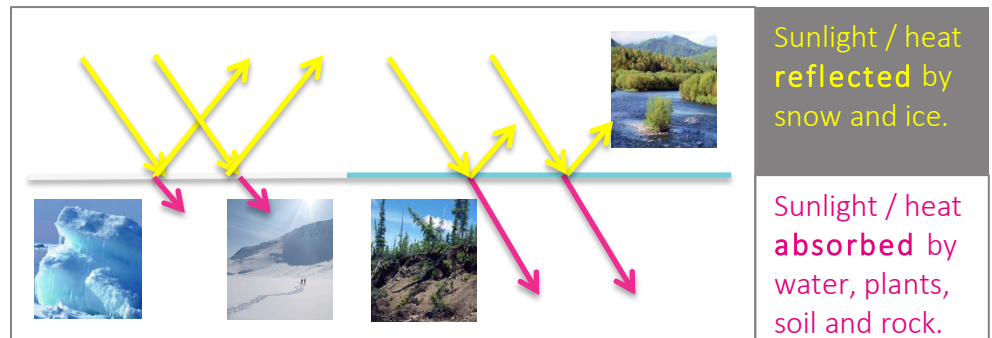


The science behind the results

Less snow and ice: a warmer world?

The temperature of the earth's surfaces has an impact on climate change. White surfaces such as snow and ice REFLECT (push away) heat, meaning that the surface stays cold. Dark surfaces such as soil, plants and water ABSORB (take in) heat, making the surface hotter.

The amount of light and heat reflected is called the 'albedo'. White surfaces have a high albedo, and dark surfaces have a low albedo.



From our experiments we know that:

1a) SNOW insulates the ground. In the first part of the experiment, the temperature stayed the same when leaves and twigs were put on top.

1b) SOIL and bare rock absorb heat. In the second part of the experiment, the temperature was THE SAME when leaves and twigs were put on top.

1c) ICE reflects heat and cools the soil or sea underneath. In the final part of the experiment, the temperature **WENT UP** when leaves and twigs were put on top.

Why does this matter?

So far, the snowy, icy, shiny surface of the Arctic's lands and seas has cooled the Earth. But as ice and snow disappear, and as more plants grow, the Arctic reflects less and traps more heat and is warming the world. Less snow and ice in the Arctic matters for two main reasons:

1. The cycle of warming – the more ice melts, the more heat the Arctic traps, further warming the world. Then more ice melts, more heat is trapped and the earth gets warmer. This is called 'positive feedback' and means the earth gets hotter more and more quickly.
2. Animals and people that depend on ice and snow might lose their habitats, food and way of life.

More information about the science behind Awesome Experiments:

www.wickedweatherwatch.org.uk/kids