

# The Day After Tomorrow & Abrupt Climate Change

Ideas about Science Worksheet Questions

1. In **section 1** of the press release there are *facts* and *predictions*. Give two examples of each.

There is a difference between **correlation** and **causation** – different variables may follow the same pattern (correlation) but this does not necessarily mean that one variable **causes** the other to happen.

## Example

- In winter we tend to wear more clothing than in summer.
- In winter rugby is played rather than summer.

There is a **correlation** between wearing more clothes and playing rugby but there is NOT a **causation**; wearing more clothes DOES NOT make you play rugby rather than cricket.

There are three variables here: the season, amount of clothing, type of sport

- Changes in the season **cause** changes in the amount of clothing we wear
- Changes in the season **cause** changes in the type of sport we play

Here are some variables from section 2 of the press release:

- Northern Hemisphere Climate
- Rate of the thermohaline circulation
- Temperature
- Salinity
- Amount of freshwater

2. Read the section carefully and identify two different pairs of variables which show a **causation** – make it clear which one causes the other

Scientists can often find **correlations** between variables but is harder to show **causation**; a **mechanism** must be put forward to explain how one variable causes changes in the other.

## Example

There is a **correlation** between the *increase in CO<sub>2</sub> levels* in the atmosphere since the Industrial Revolution and the *increase in global temperatures*. Scientists believe there is a **causation** because

*An increase in CO<sub>2</sub> increases the greenhouse effect which raises the *temperature of the Earth*.*

The **mechanism** is the greenhouse effect.

3. What is the **mechanism** for how changes in *temperature* will change the *thermohaline circulation*?

Changes in the *thermohaline circulation* will cause further changes in the *temperature*; this is an example of **feedback**.

4. What is the **mechanism** for how the changes in the *thermohaline circulation* will change the *temperature*?
5. Is this predicted to cause positive or negative **feedback**?

