

CLIMATE MODELLING WITH DR ALAN CONDRON

TALKING POINTS

KNOWLEDGE

1. What is the Gulf Stream, and how might it change if the Greenland ice sheet melts?
2. What are Dansgaard-Oeschger events?

COMPREHENSION

3. How might the collapse of the west Antarctica ice sheet contribute to cooling global temperatures?
4. What is a tipping point, and why are they cause for concern?

APPLICATION

5. How might international diplomats use Alan's research within negotiations surrounding the Paris Agreement?
6. How might national policymakers (e.g. in the UK) use Alan's research to prepare their countries for the effects of climate change?

ANALYSIS

7. What are the main similarities and differences between the projected effects of freshwater runoff from the Arctic and from the Antarctic?
8. Evidence for past Dansgaard-Oeschger events was discovered in ice cores. What do you think this evidence might be?

SYNTHESIS

9. Alan's research has shown that past climate change events do not always follow the patterns predicted by his models. If you were in his shoes, how would you go about solving this puzzle?

EVALUATION

10. Policymakers rely on robust evidence to make decisions. Several aspects of climate change (such as the effect of freshwater runoff) are not well-understood, yet the climate is already changing and it is likely that acting sooner will result in more favourable outcomes for society. If you were a policymaker, how would you reconcile this dilemma?

ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

"We are working to make models as accurate and close to reality as possible," says Alan. The Earth's climate is immensely complex, so modelling it accurately is a major challenge. Imagine you are in the early stages of designing a computer model to incorporate all the factors that influence climate change. Below are some relevant factors; use the internet to fill in the table, and add extra factors that you come across, too.

FACTOR	DESCRIPTION	EFFECT ON EARTH'S CLIMATE	MAJOR OR MINOR FACTOR?
Greenhouse gas emissions from human activity			
Absorption of CO ₂ by the ocean			
Deforestation			
Collapse of ice sheets			
Thawing permafrost			
Desertification			
Coral reef die-offs			
Carbon capture and storage by humans			

MORE RESOURCES

- You can find out more about Alan's work on his personal website: <http://www.geo.umass.edu/faculty/condron/index.html>

- This video from SciShow gives a quick breakdown of how climate modelling works and why it is useful: <https://www.youtube.com/watch?v=i9EyFghI5o>

- ClimatePrediction.net is an innovative project that uses the power of volunteers' computers to run climate modelling. They have a host of resources about their work, including many activities for schools: <https://www.climateprediction.net/about/>