

PALEOCLIMATE SCIENCE WITH DR BESS KOFFMAN

TALKING POINTS

KNOWLEDGE

1. What is an ice core?
2. On a global scale, in which directions do prevailing winds typically blow, and why?

COMPREHENSION

3. Why are ice cores such a useful scientific tool?
4. Why are scientists like Bess interested in understanding past climates?

APPLICATION

5. What questions would you ask Bess to understand how she can tell the origins of different dust particles?
6. How do you think scientific evidence contributed to the global ban on leaded gasoline? What other areas of expertise do you think were needed for this ban to come about?

ANALYSIS

7. Bess talks about the importance of communicating scientific findings. Why do you think it is important that different audiences (e.g., politicians or the general public) are aware of the research outcomes of Bess' projects?
8. Why do you think that in Alaska, it was principally higher elevations that collected dust and pollution blown from East Asia?

EVALUATION

9. One controversial recommendation for countering climate change is 'iron fertilisation', which would involve dumping large quantities of iron filings into the ocean. This would aim to cause the proliferation of phytoplankton, which can draw carbon dioxide from the atmosphere. What evidence do you think would be needed to fully assess this proposal? Do you think Bess' research could contribute to this evidence base? Can you think of any potential downsides to this approach?

CREATIVITY

10. Imagine that Bess' Antarctica research found that the West Antarctic Ice Sheet did collapse during the last warm period. What three simple sentences would you use to communicate the importance of this finding to politicians?

ACTIVITY

Design an engaging poster to illustrate ice core research and its importance for understanding past and future climates. Use Bess' article and the internet to research the following information to include:

- How ice cores act as a geological 'timeline'
- The different types of useful particles and chemicals found within ice cores
- The research processes for studying ice cores
- Key findings from ice cores through the years, and their importance for modern life

Choose your target audience. For instance, is it school students, undergraduates, politicians or members of the public at a science fair? Consider how your poster focuses on engaging this chosen audience through the following:

- Use of illustrations and diagrams to make information clear and engaging
- Which information should be prioritised or emphasised?
- Appropriate level of detail, making sure your poster is informative but does not overwhelm the reader or use terms they might be unfamiliar with
- 'Calls to action', what your audience should do with the information they have learnt

Take time to show your poster to your classmates and to read their posters. What different choices have you made? What changes would you make if you were to do the task again? What did your classmates like in your poster design?

MORE RESOURCES

- Bess' website includes information on the many different aspects of her research around the world: besskoffman.weebly.com/multimedia.html
- This article from Carbon Brief provides a deep dive into the West Antarctic Ice Sheet and the science behind the likelihood of its collapse: www.carbonbrief.org/guest-post-how-close-is-the-west-antarctic-ice-sheet-to-a-tipping-point
- This video from the UK's Natural History Museum gives an overview of what Antarctic ice cores reveal about climate change: www.youtube.com/watch?v=VjTsj-fi-p0