

# EARTH AND ENVIRONMENTAL SCIENCE WITH DR ED GASSON AND PROFESSOR CARRIE LEAR

## TALKING POINTS

### KNOWLEDGE & COMPREHENSION

1. How might the Antarctic Ice Sheet cause sea levels to rise or fall in the next 100 years?
2. What is the difference between glacial and interglacial periods?
3. Why do Earth scientists study past geological environments to research what the climate of the future will look like?
4. What is the difference between indirect and direct measurements of atmospheric CO<sub>2</sub> concentration?

### APPLICATION

5. How might Ed and Carrie's work benefit both the scientific community and wider society?

### ANALYSIS

6. What are some of the downsides of using data from the past when modelling future climates?
7. What challenges might Ed and Carrie face when collecting data from the ocean floor?

### SYNTHESIS

8. How would you test the findings from the ice sheet models? Think of direct measurements that could be taken, and how you would verify the predictions made.

### EVALUATION

9. Why might working in a diverse team of scientists be beneficial to Ed and Carrie's research? What role might (a) an Earth scientist/geologist, (b) a physicist, (c) a chemist and (d) a biologist play in this research?

### CREATIVITY

10. Can you think of any geological factors or components that Ed and Carrie should consider when designing their models? (Have a look on the Antarctic Glaciers website for more information on the Antarctic Ice Sheet.)

## ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

Create a presentation showing how the Earth's climate has changed since the Pliocene. You could include:

- how the temperature has changed during the last 5 million years
- how the temperature will change in the next 100 – 200 years. Use the changes in the mid-Pliocene (3 million years ago) to explain this
- how the Antarctic Ice Sheet was different during the mid-Pliocene to present day (Could you use this to explain how it may change in future?)
- the different ice sheets on a map of the Earth
- the changes in sea levels since the Pliocene
- any other ideas you think are important.

If you can, present to your class. Finish with a quick quiz to test how well they have followed and understood your presentation!

## MORE RESOURCES

- Visit the Antarctic Glaciers website and read up on the science behind ice sheets: [www.antarcticglaciers.org/](http://www.antarcticglaciers.org/)
- Watch the Royal Institution Christmas lecture on BBC iPlayer – Professor Chris Jackson lectures about what causes climates to change, and how humans have contributed to this: [www.bbc.co.uk/iplayer/episode/m000qjpk/royal-institution-christmas-lectures-2020-planet-earth-a-users-guide-1-engine-earth](http://www.bbc.co.uk/iplayer/episode/m000qjpk/royal-institution-christmas-lectures-2020-planet-earth-a-users-guide-1-engine-earth)
- Ed and Carrie recommend watching Chasing Ice, an Emmy award winning documentary: [www.chasingice.com/](http://www.chasingice.com/)
- There is an excellent series of webinars on the Cardiff University Earth Sciences website ([www.cardiff.ac.uk/earth-environmental-sciences/events/geotalks-webinar-series](http://www.cardiff.ac.uk/earth-environmental-sciences/events/geotalks-webinar-series)). You can find out more about any topic within Earth sciences that you are interested in!