ENVIRONMENTAL SCIENCE WITH DR ASTLEY HASTINGS

TALKING POINTS

KNOWLEDGE

1. What kind of chemicals are used to separate carbon dioxide from other exhaust gases in a power station?
2. Apart from BECCS, what are three ways in which plants can help to reduce atmospheric carbon dioxide?

COMPREHENSION

3. Why is BECCS known as a "negative emissions" technology?
4. What would happen without negative emissions technologies?

APPLICATION

5. What questions would you ask a scientist to learn more about their model?

ANALYSIS

6. In square kilometres, how much good quality agricultural land would be required for the UK to meet its BECCS target of 50 megatonnes of carbon per year? How does this compare to the area of your town/city?
7. In terms of carbon dioxide, is biomass energy without carbon capture and storage a better or worse option than burning fossil fuels? What about in terms of land use?
8. Why could it be dangerous to overstate the effectiveness of BECCS?

SYNTHESIS

9. How would you design an LCA for a bottle of milk?

EVALUATION

10. Do you think afforestation or BECCS is a better long-term approach to climate change? Why?
11. Do you think we will be able to keep the global temperature below 2 °C above pre-industrial levels? Explain your answer.

ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

1. Imagine you are environmental scientist, and you want to create model that can predict air pollution in your town or city on a given day. Create a flow diagram showing the inputs (e.g. rainfall, whether there is an event on at the stadium…) and the equations and logic (e.g. more rainfall means less people walk to work…) that will form your model.

2. It is easy to blame the oil and gas industries for their contribution to climate change but who is using the gas to heat our homes or enjoying the products made from petrochemicals, which are derived from oil and natural gas? We are! Take a look at this list of products that rely on the availability of oil and gas. How many do you use on a daily basis? It soon becomes evident just how vital it is for individuals to make climate-conscious choices: **www.energy.gov/sites/prod/files/2019/11/f68/Products%20Made%20From%20Oil%20and%20Natural%20Gas%20Infographic.pdf**

   Create a poster that suggests ways to reduce our energy consumption. Research the internet for ideas, if you need to. For example, Harvard University has listed five easy steps to reduce the amount of energy we use: **green.harvard.edu/tools-resources/poster/top-5-steps-reduce-your-energy-consumption**

MORE RESOURCES

Our World in Data has a page where you can explore the global energy mix – how much of your country's energy comes from renewables? **ourworldindata.org/energy-mix**

EDF Energy has created a Net Zero Challenge project pack, which challenges students to help their community reach Net Zero: **www.edfenergy.com/sites/default/files/net_zero_challenge_project_pack_300321.pdf**

The Science Education Resource Center at Carleton College has some wonderful resources to get your teeth into environmental science topics. For example, did early farmers alter our global climate? Find out! **serc.carleton.edu/k12/ap_ib_honors_envsci.html**

Ursinus College has a list of environmental science experiments you can easily do at home or in the classroom: **www.ursinus.edu/offices/science-in-motion/laboratory-experiments/environmental-science-laboratory-experiments/**

Science Buddies also has an array of hands-on science projects: **www.sciencebuddies.org/science-fair-projects/project-ideas/environmental-science**