

Name \_\_\_\_\_

## How Does Carbon Get into the Ground and Become Fossil Fuels

### Open-Ended Response Answer Key

1. The carbon cycle is a natural process in which carbon moves between the Earth's atmosphere, oceans, soil, and living organisms. It is significant because it regulates carbon dioxide levels in the atmosphere, influencing climate and supporting life on Earth. Carbon is absorbed by plants during photosynthesis, returned to the atmosphere through respiration and decomposition, and can be stored in the Earth's crust as fossil fuels.
2. Extracting and using fossil fuels can have environmental impacts such as air and water pollution, habitat destruction, and greenhouse gas emissions. Alternative energy sources like wind, solar, and hydroelectric power can mitigate these impacts by providing cleaner and more sustainable sources of energy.
3. As a scientist studying the conversion of fossil fuels into cleaner energy sources, I might investigate technologies like carbon capture and storage (CCS), which capture carbon dioxide emissions from fossil fuel combustion and store them underground. Additionally, exploring advanced biofuels and hydrogen production from renewable sources could offer cleaner alternatives to traditional fossil fuels, benefiting both the environment and society.
4. Transitioning from fossil fuels to renewable energy sources presents challenges such as initial costs and infrastructure changes, but it offers benefits like reduced greenhouse gas emissions, improved air quality, and energy security. It could also create new job opportunities in the renewable energy sector and reduce dependence on finite fossil fuel resources. However, the transition must be carefully managed to ensure a just and equitable transition for all communities.

