

LAB 22

Checkout Questions

Lab 22. Minimizing Carbon Emissions: What Type of Greenhouse Gas Emission Reduction Policy Will Different Regions of the World Need to Adopt to Prevent the Average Global Surface Temperature on Earth From Increasing by 2°C Between Now and the Year 2100?

1. In the past century, how have humans increased the amount of carbon dioxide in the atmosphere?
2. What methods can produce usable energy without carbon dioxide emissions?

Minimizing Carbon Emissions

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3. A student has submitted the following plan to reduce carbon dioxide emissions to 20% of the levels in 1990.

Action area	Policy	Result
Biofuel production	Government subsidies on land used for biofuel	Use 8,000 square miles of land to grow biofuels. Additionally, import the same amount of biofuels.
Oil, gas, and coal power	Some oil refineries and coal plants shut down to reduce availability of fossil fuels	Reduce the amount of fossil fuels used by 50%
Nuclear power	Tax reductions on nuclear power plants	Build 13 large nuclear power plants around the country.
Wind turbines	Tax credits for businesses that install wind turbines; state funding allocated for building wind turbines	Build 13,000 wind turbines on land and 17,000 wind turbines offshore.
Manufacturing growth	Strict regulations on new and existing manufacturing companies	Manufacturing declines, becoming roughly one-third smaller than existing manufacturing.
Home efficiency	Tax breaks and refunds for adding insulation to new and existing homes	Additional installation is installed in 75% of homes.
Home temperature	Radio, television, and internet advertisements that encourage thermostat changes	The average home temperature in the winter decreases from 17.5°C to 17°C.
Heating fuel	Increased taxes on coal- or gas-burning furnaces	About 20% of domestic heat is powered by electricity.
How we travel	Decreased prices on public transportation, as well as an increase in number of stops	People use public transportation for about one-quarter of their journeys.
Transport fuel	Government regulation that three out of five of the cars sold must be powered by electricity	Three out of five of cars driven are powered by electricity.

- a. Which actions seem feasible for a country to carry out by 2050?

- b. Why?

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c. Which actions do not seem feasible for a country to carry out by 2050?

d. Why not?

4. Models are pictures created by scientists to teach something to others.

a. I agree with this statement.

b. I disagree with this statement.

Explain your answer, using an example from your investigation about minimizing carbon emissions.

Minimizing Carbon Emissions

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5. Science can answer any question.

- a. I agree with this statement.
- b. I disagree with this statement.

Explain your answer, using an example from your investigation about minimizing carbon emissions.

6. Defining a system under study and making a model of it are tools for developing a better understanding of natural phenomena in science. Explain why it is important to make models of natural phenomena, using an example from your investigation about minimizing carbon emissions.

7. When studying a system, one of the main objectives is to determine how the system is changing over time and which factors are causing the system to become unstable. Explain why determining how a system changes over time is important, using an example from your investigation about minimizing carbon emissions.