Unit 9: Sustainability - Study Guide (Key)

Presentation 1: Climate Change Solutions

Vocabulary:

1. Climate Change - **a change in the average temperature and weather over a long period of time**

Questions:

2. List the problems associated with climate change.
    - **Coral bleaching**
    - **Drought**
    - **Biodiversity Loss**
    - **Rise in Sea Level**

3. Describe the main causes of climate change.
    - **Burning of fossil fuels releases CO_2 into the atmosphere**
    - **Deforestation releases CO_2 into the atmosphere and reduces the ability of trees to remove carbon dioxide from the atmosphere.**
    - **Reduction of biodiversity leads to ecosystem instability that further reduces natures ability to capture CO_2 from the atmosphere**

4. Are the individuals who cause climate change the main people affected by climate change? Explain.
   No. Wealthy nations are the main perpetrators of climate change (as their industries and lifestyles have a large carbon footprint), but because of their wealth they can shield themselves from most of the effects of climate change. This leaves those in the poorest countries suffering the most from climate change.

5. What are the solutions for climate change?
    - **Move to net-zero emissions as fast as possible**
        - **Invest in renewable energy**
        - **Improve transportation industry**
        - **Change diet to eat less meat and dairy products**
        - **Circular economy (less waste and destruction)**

   Basically, anything that reduces carbon emissions or helps ecosystems take up carbon.

6. How can we adapt to how the climate has already changed?
    - **Aid the poor, as they are the most vulnerable to the effects of climate change**
    - **Improve crop resistance to drought, floods, etc. (genetic engineering?)**
    - **Adapt our living conditions to prepare for heat**

Air Pollution Simulation Lab and **Air Pollution Solutions Table**

Vocabulary:

7. Air Pollution - **the presence of harmful substances in the air**

Questions:

8. Describe the main sources of air pollution.
    - **Burning fossil fuels**
    - **Vehicle emissions (cars, trucks, trains, ships, airplanes)**
    - **Industrial processes (because they burn fossil fuels)**
    - **Agriculture (from livestock or from crop burning)**

9. Describe six ways to reduce air pollution.
    - **Give everyone access to clean cooking fuels (this will reduce things like wood burning and reduce respiratory disease)**
    - **End winter crop burning (by turning crop waste into compost or biofuels)**
    - **Remove sulfur from fossil fuels (released sulfur causes acid rain and pollution, remove it during the refining process to stop this)**
    - **Drive cleaner cars (electricity, driven by renewables, will help reduce emission from transportation)**
    - **Drive less (mass transportation or clean things like bikes)**
    - **Replace fossil fuels with renewables and nuclear energy (take away fossil fuel use and air pollution goes way down)**

Presentation 2: Deforestation Solutions

Vocabulary:

10. Deforestation - **large-scale clearing or removal of forests**

11. Primary Forest - **a natural, mature forest that has not been significantly disturbed by human activity**

12. Agriculture - **the practice of farming, including growing crops and raising livestock**

Questions:

13. What drives deforestation?
    - **Agriculture. About 75% of all global deforestation is to make room for agriculture. Beef is the worst culprit, accounting for 40% of deforestation.**

14. Does deforestation affect developed nations or developing nations more? Explain.
    - **Developing countries, especially in tropical regions. Forests are cleared to produce food and products, with developed nations protecting their forests at the expense of other nations.**

15. Is most deforestation due to international trade or local needs?
    - **Local needs. Very little deforestation is caused by international trade.**

16. What are the best solutions for deforestation?
    - **Eat less beef**
    - **Buy sustainable food and products**
    - **Reduce overall consumption**
    - **Improve crop yields (more food on less land)**
    - **Protections (laws, etc.) for forests**

Presentation 3: Sustainable Food Production

Vocabulary:

17. Sustainable food production - **producing food in ways that can be maintained without further harm to the environment**

18. Crop yield - **the amount of food produced per unit of land**

19. Food waste - **food that is produced but not eaten**

20. Hybrid meat - **a product that mixes meat with plant-based ingredients to reduce environmental impact**

21. Indoor farming - **growing crops inside controlled environments, often using vertical farming**

22. Organic farming - **a farming system that avoids synthetic fertilizers and pesticides**

Questions:

23. Describe four sustainable farming practices.
    - **Increase crop yields**
        - **Use fertilizers effectively**
        - **Improve seed varieties (reduces potential loss)**
        - **Improves irrigation (can dramatically increase production, especially in arid areas)**
    - **Eat less meat**
        - **Livestock production uses more land, water, crops, energy, and releases more greenhouse gases.**
        - **Hybrid-meats can help reduce all of this**
    - **Eat less dairy**
        - **Same as above**
        - **Use plant based milks**
    - **Waste less food**
        - **About ⅓ of all food is wasted**
        - **Finding ways to prevent loss in transportation, storage, and homes reduces the need for more food**

24. What are the limitations of indoor farming?
    - **High energy use**
    - **Works better for smaller crops**
    - **Not practical for staples like wheat or corn**

25. Is organic farming always the better option?
    - **Not always. Organic farming tends to have lower yields, requires more land, and both of those can lead to further environmental problems**