



Introduction (10 minutes)

Read the introduction to the Environmental Science and Sustainability Assessment and answer the following questions:

1. What is the primary goal of a circular economy?

2. What is the main difference between a linear economy and a circular economy?

3. What are the benefits of a circular economy for the environment and society?

Multiple Choice Questions (20 minutes)

Choose the correct answer for each question:

1. What is the primary goal of a circular economy?
- A) To reduce waste and promote recycling
 - B) To increase consumption and economic growth
 - C) To conserve natural resources and reduce pollution
 - D) To promote sustainable development and social equity

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2. Which of the following is an example of a bioeconomic product?
- A) Plastic bag
 - B) Biodegradable packaging
 - C) Fossil fuel
 - D) Electronic device

3. What is the main difference between a linear economy and a circular economy?

- A) Linear economy focuses on recycling, while circular economy focuses on reducing waste
- B) Linear economy focuses on reducing waste, while circular economy focuses on recycling
- C) Linear economy is based on the concept of "take, make, dispose," while circular economy is based on the concept of "reduce, reuse, recycle"
- D) Linear economy is more sustainable than circular economy

Short Answer Questions (30 minutes)

Answer the following questions in complete sentences:

1. Compare and contrast the durability of old and modern school materials. Provide examples of each.

2. Describe the concept of a circular economy and its benefits for the environment and society.

3. What are the advantages and disadvantages of using biodegradable materials in product design?

Case Study (40 minutes)

Read the following case study and answer the questions:

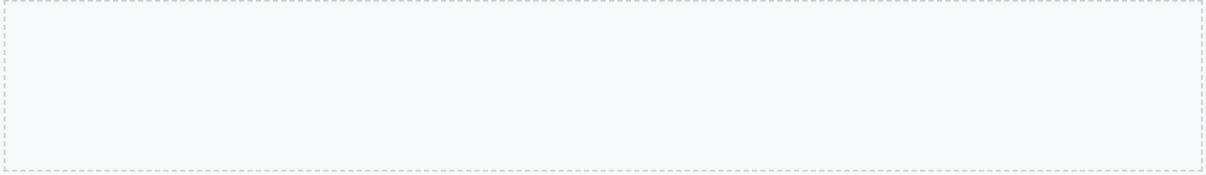
A local community is planning to develop a new sustainable product for 2050. The product should be designed to reduce waste, promote recycling, and conserve natural resources. The community has identified two potential products: a biodegradable water bottle and a reusable shopping bag. Evaluate the socio-economic impacts of each product and recommend which one to develop.

1. What are the potential environmental benefits of each product?

2. What are the potential socio-economic benefits of each product?

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3. Which product do you recommend and why?



Design Challenge (30 minutes)

Design a sustainable product for 2050 that addresses the following criteria:

- Reduces waste and promotes recycling
- Conserves natural resources
- Promotes social equity and sustainable development

Submit a detailed design plan, including materials, production process, and potential impacts.

[Space for design plan]

Additional Activities (30 minutes)

Choose one of the following activities:

1. Create a poster or infographic about the benefits of a circular economy.

2. Write a short essay on the importance of sustainable product design in reducing waste and promoting recycling.

3. Design a public awareness campaign to promote the use of biodegradable materials in product design.

Sustainable Development and Social Equity

Sustainable development is a crucial aspect of environmental science and sustainability. It involves meeting the needs of the present without compromising the ability of future generations to meet their own needs. Social equity is also a key component of sustainable development, as it ensures that the benefits and costs of development are shared fairly among all members of society.

Example: Sustainable Development in Practice

The city of Copenhagen has implemented a number of sustainable development initiatives, including a carbon-neutral heating system and a bike-sharing program. These initiatives have not only reduced the city's carbon footprint but also improved the quality of life for its citizens.

Reflection

Consider a city or community that you are familiar with. What sustainable development initiatives could be implemented to improve the quality of life for its citizens while reducing its environmental impact?

Environmental Policy and Governance

Environmental policy and governance play a critical role in protecting the environment and promoting sustainability. Governments, businesses, and individuals must work together to develop and implement policies that prioritize environmental protection and sustainable development.

Case Study: The Paris Agreement

The Paris Agreement is an international agreement aimed at mitigating climate change by reducing greenhouse gas emissions and promoting sustainable development. The agreement sets a global goal to limit global warming to well below 2°C and pursue efforts to limit it to 1.5°C above pre-industrial levels.

Group Activity: Developing Environmental Policy

Divide into small groups and develop an environmental policy for a hypothetical city or community. Consider the following factors: climate change, air and water pollution, waste management, and conservation.

Environmental Economics and Ethics

Environmental economics and ethics are essential components of environmental science and sustainability. Environmental economics examines the economic impacts of environmental policies and the economic benefits of environmental protection. Environmental ethics considers the moral and ethical implications of human actions on the environment.

Example: Cost-Benefit Analysis

A cost-benefit analysis is a tool used in environmental economics to evaluate the costs and benefits of a project or policy. For example, a cost-benefit analysis of a wind farm might consider the costs of construction and maintenance versus the benefits of reduced greenhouse gas emissions and job creation.

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Reflection

Consider an environmental issue that you are passionate about. How can environmental economics and ethics be used to inform decision-making and promote sustainable development?

Environmental Science and Technology

Environmental science and technology are critical components of environmental protection and sustainable development. Environmental science examines the natural world and the impacts of human activities on the environment. Environmental technology develops innovative solutions to environmental problems, such as renewable energy and sustainable materials.

Case Study: Renewable Energy

Renewable energy sources, such as solar and wind power, are becoming increasingly important as the world transitions to a low-carbon economy. Renewable energy can reduce greenhouse gas emissions, improve air quality, and promote energy security.

Group Activity: Designing Sustainable Solutions

Divide into small groups and design a sustainable solution to an environmental problem, such as climate change, air pollution, or waste management. Consider the following factors: environmental impact, economic viability, and social equity.

Environmental Education and Community Engagement

Environmental education and community engagement are essential components of environmental protection and sustainable development. Environmental education informs and empowers individuals to make environmentally responsible decisions. Community engagement involves working with communities to develop and implement environmental initiatives.

Example: Community-Based Conservation

Community-based conservation involves working with local communities to develop and implement conservation initiatives. This approach can promote environmental protection, improve livelihoods, and foster social equity.

Reflection

Consider a community-based conservation initiative. How can environmental education and community engagement be used to promote environmental protection and sustainable development?

Conclusion

In conclusion, environmental science and sustainability are critical components of promoting a healthy and thriving planet. By understanding the natural world, developing sustainable solutions, and engaging with communities, we can mitigate environmental problems and promote sustainable development.

Case Study: Sustainable Development in Action

The city of Vancouver has implemented a number of sustainable development initiatives, including a green building program and a sustainable transportation system. These initiatives have not only reduced the city's environmental impact but also improved the quality of life for its citizens.

Group Activity: Developing a Sustainable Future

Divide into small groups and develop a plan for promoting sustainable development in your community. Consider the following factors: environmental protection, economic viability, and social equity.

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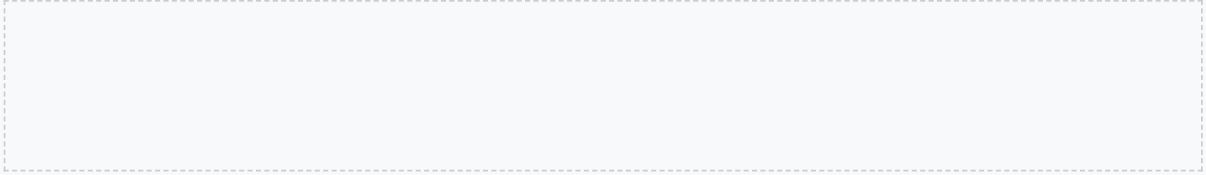
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