**Topic HL.b Environmental Economics**

**Guiding questions**

* How can environmental economics ensure sustainability of the Earth’s systems?
* How do different perspectives impact the type of economics governments and societies run?
* How do different economic instruments affect behavior change towards sustainability in various sectors of the economy?
* What are the limitations of traditional cost-benefit analyses in capturing the true environmental costs of economic activities?
* How can environmental economics help in formulating policies that balance economic growth with ecological preservation?

| **Understandings** | Class | Home | Got it |
| --- | --- | --- | --- |
| HL.b.1 Economics studies how humans produce, distribute and consume goods and services, both individually and collectively. |  |  |  |
| HL.b.2 Environmental economics is economics applied to the environment and environmental issues. |  |  |  |
| HL.b.3 Market failure occurs when the allocation of goods and services by the free market imposes negative impacts on the environment. |  |  |  |
| HL.b.4 When the market fails to prevent negative impacts, the polluter-pays principle may be applied. |  |  |  |
| HL.b.5 “Greenwashing” or “green sheen” is where companies use marketing to give themselves a more environmentally friendly image. |  |  |  |
| HL.b.6 The tragedy of the commons highlights the problem where property rights are not clearly delineated and no market price is attached to a common good, resulting in overexploitation. |  |  |  |
| HL.b.7 Environmental accounting is the attempt to attach economic value to natural resources and their depletion. |  |  |  |
| HL.b.8 In some cases, economic value can be established by use, but this is not the case for non-use values. |  |  |  |
| HL.b.9 Ecological economics is different from environmental economics in that it views the economy as a subsystem of Earth’s larger biosphere and the social system as being a sub- component of ecology. |  |  |  |
| HL.b.10 While the economic valuation of ecosystem services is addressed by environmental economics, there is an even greater emphasis in ecological economics. |  |  |  |
| HL.b.11 Economic growth is the change in the total market value of goods and services in a country over a period and is usually measured as the annual percentage change in GDP. |  |  |  |
| HL.b.12 Economic growth is influenced by supply and demand, and may be perceived as a measure of prosperity. |  |  |  |
| HL.b.13 Economic growth has impacts on environmental welfare. |  |  |  |
| HL.b.14 Eco-economic decoupling is the notion of separating economic growth from environmental degradation. |  |  |  |
| HL.b.15 Ecological economics supports the need for degrowth, zero growth or slow growth, and advocates planned reduction in consumption and production, particularly in high-income countries. |  |  |  |
| HL.b.16 Ecological economists support a slow/no/zero growth model. |  |  |  |
| HL.b.17 The circular economy and doughnut economics models can be seen as applications of ecological economics for sustainability. |  |  |  |

**INTRODUCTION TO ECONOMIC CONCEPTS**

1. **Define** "economics"
	1. How is economics integral to understanding environmental systems?
2. Watch the video on “What Is Economics” <https://youtu.be/dVTNmSmUo14> asnwer the following questions
	1. **State** the basic economic problems that every society faces according to the video?

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* 1. **Explain** the concept of 'opportunity cost'
	2. L**ist**  the three main economic systems mentioned in the video. For each system, note key characteristics and their implications for environmental policies.
1. Watch the video “The Four Types of Economies” <https://youtu.be/5vTdPNY7P2w> Answer the following questions
	1. **List** the four types of economies discussed in the video,
	2. **State** how each type determine how resources are allocated
	3. **Outline** the main advantages and disadvantages of a market economy

 Advantages

 Disadvantages

* 1. How does the government influence economic activities? Provide an example of a government intervention that benefits environmental sustainability.
1. **Define** "market failure". Give an example related to environmental impact.
2. Economics focuses on supply and demand of resources and the outcomes of market interaction. Watch the video on “Supply and Demand” <https://youtu.be/LTKP-mm3Hb0> answer the following questions
	1. **Define**  'supply' and 'demand'
	2. **Outline** how the video illustrate the effect of price changes on supply and demand
	3. **Describe** a real-world example provided in the video where supply and demand dynamics are clearly demonstrated
3. **Outline** how economic principles are applied
4. What is the embedded economy and how does it illustrate the relationship between economic activities and natural systems?

Provide an example of an embedded economy approach leading to sustainable practices**.**

* 1. **Discuss** how adopting an embedded economy can lead to more sustainable economic and environmental policies.
1. **Outline** the role of mainstream economics
2. Complete the table below

| EVS | Perspective | Example |
| --- | --- | --- |
| Technocentric |  |  |
| Ecocentric |  |  |

1. Watcth the video on “Ten Things To Know About Economics” <https://youtu.be/_VShdCUG3yU> . Complete the questions
	1. **Identify** three of the ten things about environmental economics. State how these aspects demonstrate the role of environmental economics in managing natural resources
	2. **State** the significance of externalities in environmental economics
	3. **Discuss** how the concept of the 'tragedy of the commons' is addressed in environmental economics
2. Create a mind map summarizing the basic concepts of environmental economics introduced in HL.a.1, including market failure, the Polluter-Pays Principle, and greenwashing.
3. **Activity** Choose from one of the case study related to environmental economics.

Polluter Pays - HL.b.4

Greenwashing - HL.b.5

The Tragedy of the Commons - HL.b.6

Plastic Pollution Management

* 1. **Identify** the key economic principles and concepts that are relevant to the case.
	2. **Identify** potential solutions or recommendations based on economic principles to address the challenges or issues presented in the case study.
	3. **Evaluate** the effectiveness of economic principles in addressing real-world environmental challenges.

**Market Failures and Government Interventions**

1. **Define** market failure
	1. **State** how market failures impact the environment
2. Complete the table

| **Types of Market Failures** | **Definition** | **Example** |
| --- | --- | --- |
| externalities |  |  |
| public goods |  |  |
| imperfect competition |  |  |
| information asymmetry |  |  |

1. Watch the video “A Market for Lemons” <https://youtu.be/tyzf3T2LASs>. Complete the questions below
	1. **E**x**plain** how this concept applies to environmental markets.
	2. **Discuss** how information asymmetry can affect consumer and seller behavior in environmental contexts.
2. Watch the video “How Coke Killed the Recylable Bottle” <https://youtu.be/4XP-BBGMCNs>. Complete the question below
	1. **Discuss** how Coca-Cola’s shift from recyclable to non-recyclable bottles has impacted the environment and recycling industries
	2. **Suggest** alternative strategies that Coca-Cola could employ to enhance sustainability.
3. "Which type of market failure do you think impacts your community the most. Justify your answer:
	1. Externalities
	2. Public Goods
	3. Imperfect Competition
	4. Information Asymmetry
4. Government Interventions
	1. Regulation: **Outline** how governments can impose regulations requiring businesses to limit their pollution levels, directly addressing negative externalities.
	2. Taxes and Fees: **Explain** the concept of Pigouvian taxes and how they compel businesses to internalize the external costs they create, using examples such as carbon taxes.
	3. Subsidies and Incentives: **Describe** how offering subsidies for environmentally friendly practices or technologies can incentivize sustainable choices for businesses and consumers.
	4. Tradable Permits: **Describe** the cap-and-trade system, where companies can buy and sell permits to emit pollution, establishing a market price for pollution that incentivizes reductions where they are most cost-effective.
5. "Imagine your city is facing severe air pollution due to car emissions. Would you recommend a tax on gasoline, a subsidy for electric vehicles, or a cap-and-trade system for emissions? Why?"
6. **Activity:** Love Canal is a neighborhood in Niagara Falls, New York, known for one of the most notorious environmental disasters in US history. In the late 19th and early 20th centuries, the area was used as a chemical dump site by the Hooker Chemical Company, which disposed of over 21,000 tons of toxic waste in the abandoned canal.
	1. identify the key points of information
	2. collect data and evidence to illustrate the extent of industrial pollution and its consequences on the environment and society.
	3. analyze the Love Canal market failure and the implications for sustainable development
	4. evaluate government policies and interventions aimed at mitigating industrial pollution, including their effectiveness and limitations

**Economic Value and Sustainability**

1. **Define** environmental accounting
	1. **Explain** how environmental accounting attempts to factor the environmental costs into business decisions.
2. Watch the video “Put a Value on Nature” <https://youtu.be/oU9G2E_RYJo> Answer the questions below
	1. **State** why it is essential to put a monetary value on nature?
	2. **State** how the speaker propose we calculate the economic value of nature
	3. **Outline** the potential benefits and challenges of putting a monetary value on nature
	4. **Discuss** how this approach could impact environmental policy and conservation efforts.
3. **Outline** the benefits and challenges associated with environmental accounting

| **Benefits** | **Challenges** |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. Complete the table on the types of economic values

| **Type of value** | **Definition** | **Example** |
| --- | --- | --- |
| Use value |  |  |
| Non-use value |  |  |
| Bequest Value |  |  |

1. **State** why bequest value is significant in conservation efforts?
2. **Outline** how economic valuation can influence environmental policy and conservation strategies.
	1. Provide examples of how placing a monetary value on ecosystems has benefited conservation efforts.
3. Watch the video How to Value and Account for Ecosystems ,<https://www.youtube.com/watch?v=4U9nbhzvOYI> and answer the following questions
	1. **Summarize** key points from the video, highlighting new perspectives or methods introduced.

Reflect on how understanding economic value can change the approach to environmental management and sustainability.

1. **Activity:** Select one of the environmental assets

 Biodiversity hotspots Coral reef ecosystems

Old-growth forests Wetland ecosystems (e.g., mangroves, marshes)

Carbon sequestration in forests Soil health and fertility

Climate regulation and carbon storage Genetic diversity in agricultural crops or wild species

Wildlife habitats and endangered species protection

Recreational and tourism value of natural landscapes (e.g., national parks, scenic vistas)

Ecosystem services provided by urban green spaces (e.g., urban parks, green roofs)

Clean water and freshwater ecosystems (e.g., rivers, lakes)

Pollinator habitats (e.g., bee colonies, butterfly gardens)

* 1. Assign monetary values to the selected environmental assets based on the following criteria:
		1. **Direct Economic Value:** Identify any direct economic benefits associated with the asset, such as timber production, water purification, or tourism revenue.
		2. **Indirect Economic Value**: Consider secondary benefits or ecosystem services provided by the asset, such as flood mitigation, climate regulation, or habitat provision.
		3. **Intrinsic Value:** Reflect on the inherent worth or importance of the asset, acknowledging its value beyond human utility.

Use various valuation methods, such as market-based approaches, cost-based approaches, or stated preference methods, to determine the economic value of each asset

**Ecological Economics**

1. Watch the video on Ecologial Economics <https://youtu.be/sIJFWhYLsms> and answer the following questions
	1. D**efine** ecological economics. How does it differ from conventional economics
	2. **Explain** at least two key principles or concepts that are central to ecological economics
	3. **Discuss** an example provided in the video where ecological economics has been applied to solve an environmental issue. What strategies were used and what were the outcomes?
2. **List K**ey Principles of Ecological Economics
3. Complete the table

| **Types of values** | **Definition** | **Example** |
| --- | --- | --- |
| Provisioning services |  |  |
| Regulating services |  |  |
| Cultural services |  |  |
| Supporting services |  |  |

1. Watch the video on Teaching the ecological value of trees <https://youtu.be/3HW87jIVZJE?si=mLGn7tDUUn_jEHxb>, and answer the questions
	1. **Summarize** the main points and discuss the practical implications for ecological economics.
2. **State** the purpose of a resource transfer agreement
	1. **Identify** the challenges associated with resource transfer agreements
	2. **Outline** the tensions associated with resource transfer agreements
	3. **Evaluate** the effectiveness of REDD+ as a resource transfer agreement

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1. **Actvity:** Research one of the following case study

REDD+ (Reducing Emissions from Deforestation and Forest Degradation):

Payment for Ecosystem Services (PES) in Costa Rica:

Biodiversity Offsetting in Australia:

Marine Protected Areas (MPAs) in Southeast Asia:

Oil-for-Development in Ecuador:

Conservation Easements in the United States:

Water Transfer Agreements in the Middle East:.

Sustainable Palm Oil Certification in Indonesia:

Indigenous Land Rights in Brazil's Amazon Rainforest:

Eco-Tourism Development in Kenya:

Complete the following:

* **Background information:** Context, countries involved, environmental significance of the natural assets, economic considerations, etc.
* **Terms of the agreement:** Details of the agreement, financial transactions involved, commitments made by each party, enforcement mechanisms, etc.
* **Impacts and outcomes**: Environmental impact assessments, economic benefits or losses, social implications, changes in land use or conservation practices, etc.
* evaluate the strengths, weaknesses, opportunities, and threats associated with the agreement

**Economic Growth**

1. **Define** economic growth
	1. **Describe** its common indicators (GDP, GNP).
	2. **Outline** the historical context of economic growth
	3. **State** how economic growth is measured.
2. **List** the benefits of economic growth.
3. **Suggest** how economic growth improves living standards and reduces poverty
4. **Discuss** the limitations of using GDP as a measure of economic growth.
	1. **Identify** the important factors GDP overlooks
5. **List** alternative measures that might provide a more comprehensive view of economic growth.
6. **Explain** how sustainable economic growth differ from traditional economic growth?
	1. **Explain** the integration of environmental and social factors in measuring sustainable growth.
7. **Outline** how green taxation and emissions trading aims to incorporate environmental costs into economic decision-making
8. Reflect on the impact of economic growth on quality of life. S**uggest** how economic growth positively or negatively affect environmental conditions in various regions
9. **State** the challenges that are associated with achieving sustainable economic growth. How can these challenges be addressed?
10. Economic growth is often measured by changes in Gross Domestic Product (GDP) or Gross National Product (GNP). Click [here](https://ourworldindata.org/grapher/national-gdp-constant-usd-wb?tab=table) <https://ourworldindata.org/grapher/national-gdp-constant-usd-wb?tab=table> and find the most current GDP of your country. How does this compare to a contrasting country?
11. **Outline** the challenges of using GDP alone
12. Watch the video on Supply and Demand <https://youtu.be/GqeRnxSuLFI> and answer the following questions
	1. **Define** 'supply' and 'demand'
	2. **State** how the video illustrates the impact of changes in supply and demand on market prices
	3. Provide an example from the video where an external factor influences either the supply or the demand for a product. How does this change affect the market equilibrium?
13. Watch the video on How to Design the Circular Cconomy, <https://www.youtube.com/watch?v=heIXdS7Gs7c&t=2s> and answer the following questions
	1. **Define** circular economy
	2. **State** how a circular economy differ from a traditional linear economy
	3. **Describe** a specific example provided in the TED Talk where a company or industry has successfully implemented circular economy practices. What were the outcomes?
14. **State** the challenges of implementing an integrated approach to development that considers both economic and environmental factors.
15. **Explain** the relationship between economic growth and its impacts on environmental resources and ecosystem services
16. **Discuss** the dual nature of economic growth in terms of its potential benefits and environmental costs.
17. **Activity**: You will need to access the Economic growth impacts on environmental welfare worksheet, <https://docs.google.com/document/d/1qn-fmJ2rv3YcA_ka45bl5JCymcjdMEJ6a_agMvu4CbM/edit?usp=sharing>. . Choose one of the provided case studies from the list provided. Each case study represents a different environmental issue linked to economic growth in various regions of the world. Make sure this is part of your notes

**Decoupling**

1. **Define** eco-economic decoupling,
	1. **State** the difference between relative and absolute decoupling

 Relative decoupling -

 Absolute decoupling -

1. **identify and explain** the strategies or policies mentioned that are designed to promote green growth and decoupling.
2. **Discuss** the challenges and limitations of achieving absolute decoupling. What are some potential solutions or alternative approaches
3. **Activity**: Select one of the case studies

Germany's Energiewende China's Green Growth Initiatives

Costa Rica's Pura Vida Economy Sweden's Circular Economy Model:

Singapore's Sustainable Development Strategy Denmark's Wind Energy Revolution:

Bhutan's Gross National Happiness Index California's Clean Energy Transition:.

Netherlands' Sustainable Agriculture Practices South Korea's Green New Deal

considering the following:

* 1. Economic growth trends (GDP growth)
	2. Environmental impact indicators (carbon emissions, resource consumption, pollution levels)
	3. Policy interventions or technological innovations implemented to achieve decoupling
	4. Challenges faced during the decoupling process
	5. Overall success or failure in achieving eco-economic decoupling

**Degrowth**

1. **Define** degrowth
	1. **Suggest** how degrowth proposes to address environmental and economic challenges
2. **Outline** how the ideas of zero growth or slow growth differ from traditional economic growth models

| **Growth Models** | **Explanation** | **Benefits** | **Challenges** |
| --- | --- | --- | --- |
| Zero growth/slow growth |  |  |  |
| Traditional |  |  |  |

1. **Discuss** specific strategies or policies that could support the implementation of degrowth or slow growth economies.
2. **State** the ethical and practical implications of adopting a degrowth or zero growth model.
	1. **Sugges**t how these models affect global and local economies
3. Provide an example of a community, region, or country that has attempted to implement principles of degrowth or zero growth? What were the outcomes, and how do they reflect the concepts of degrowth
4. **Define** steady-state economy
	1. How does it aim to balance economic activities with ecological limits?
5. **Discuss** the main factors that necessitate the transition to a steady-state economy.
	1. Suggest why this transition considered crucial for sustainable development
6. **Outline** the challenges and potential barriers to achieving a steady-state economy
7. **Describe** some policy measures or strategies that could facilitate the transition to a steady-state economy.
8. **Evaluate** the potential impacts of a steady-state economy on global and local scales. What benefits and drawbacks might arise from such an economic system?
9. **Activity:** Choose a case study that exemplifies the implementation or potential application of slow/no/zero growth principles. This could include a specific policy initiative, community project, or economic transition strategy.

Bhutan's Gross National Happiness Index Transition Town Movement

The Doughnut Economics Framework in Amsterdam Ecuador's Yasuní-ITT Initiative

Costa Rica's Ecotourism and Environmental Conservation Universal Basic Income Pilots

The Green New Deal: United States

* 1. Provide context on the economic, social, and environmental conditions that led to the adoption of slow/no/zero growth principles.
	2. Identify the primary goals and objectives of the initiative or project.
	3. Identify the strategies and measures implemented to promote sustainability, equity, and well-being while minimizing reliance on GDP growth
	4. Assess the observed outcomes and impacts of the slow/no/zero growth approach on economic development, environmental conservation, and social welfare
	5. Analyze the challenges faced and successes achieved in implementing the slow/no/zero growth model. Consider factors such as political, economic, and social barriers, as well as enabling conditions and supportive factors.
	6. Suggest lessons that can be learned from this case study for future policy and practice in sustainable economic development?

**Sustainable Economic Models**

1. **Describe** the Circular Economic model
2. **Describe** the Doughnut Economic model
3. **Discuss** the challenges and barriers to implementing the economic models
4. **Activity**: Reference Kognity HL.b Environmental Economics topic

Reference the table to compare environmental and ecological economics

Review HL.b.4, Write the main assumptions and theories of environmental economists in the left-hand column. Summarise the points in as few words as possible.

Use the same table to identify the information on the perspective of ecological economics (HL.b.5), areas of agreement on sustainability solutions (HL.b.6) and areas of difference on sustainability solutions (HL.b.7 and HL.b.8).

| **Topic** | **Environmental (mainstream) economics** | **Ecological economics** |
| --- | --- | --- |
| Beliefs about human nature |  |  |
| Main cause of environmental degradation |  |  |
| Relationships between economic actors |  |  |
| Main economic goal |  |  |
| Model of the economy |  |  |
| Proposed solutions to improve sustainability |  |  |
| Areas of agreement on solutions |  |  |

**Reflection Journal:** Write down your thoughts, questions, and reflections on what they have learned.

ESS can be like learning a new language. So many words are not commonly used in everyday English. This can be challenging. To help you keep up with ESS Terms, you will need to create your own ESS DICTIONARY. You should add to this over the year and keep it in your notebook or on a page file THAT YOU CAN UPDATE AND ADD TO EASILY. Most of the vocabulary words can be found either on your STUDY GUIDE or at mrgscience.com.

You will be responsible for learning the words and their meaning. Periodic quizzes will be given on the words. So, make your dictionary creative and you will remember the words more easily.

**KEY TERMS**

economic growth

environmental economics

market failure

market-based policies

technocentrism

polluter-pays principle

greenwashing

tragedy of the commons

​non-use values

sustainable development

environmental accounting

ecological economics

degrowth

​GDP

​supply and demand

precautionary principle

environmental litigation

​market price

resource depletion