

## Interdisciplinary essays

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An interdisciplinary extended essay (EE) gives students an opportunity to undertake an in-depth and independent investigation into a topic of their choice that considers the relationship between subjects and allows for meaningful connections to be made in relation to their chosen area of research.

For a longer general introduction to undertaking an EE in an interdisciplinary subject area, see [Interdisciplinary essays: An introduction](#).

# Environmental systems and societies: Subject-specific guidance

See also: EE generic guide and EE teacher support materials

## Overview

Environmental issues occupy a position of increasing significance on the world agenda. An EE in environmental systems and societies gives students an opportunity to explore an environmental topic of particular interest to them.

Since the subject is interdisciplinary, the student will need to select and integrate theoretical contexts and methodologies with those academic disciplines appropriate to the chosen topic.

In this respect, a systems approach is particularly effective, and students will be expected to use this approach in the analysis and interpretation of their data.

## Choice of topic

Environmental systems and societies focuses upon the interaction and integration of “natural” environmental systems and human societies. An EE in this subject should give significant (though not necessarily equal) weight to both these dimensions.

The topic should allow the student to demonstrate some grasp of how environmental systems and societies function together. For example:

- studying pure ecological principles within the context of human interaction with the environmental system
- addressing philosophical approaches to the environment in relation to specific natural systems.

Students must ensure that their topic would not be better submitted under one of the specialized subject areas of the experimental or the human sciences. For example, topics focusing exclusively on human health, disease or politics are usually more appropriate to a single-discipline essay.

The topic must be open to analytical argument. If it lends itself only to a descriptive or narrative treatment, the student will be unable to achieve marks for critical thinking in the assessment criteria.

For example, it would be of minimal value simply to **describe** a given nature reserve. Instead, the topic should involve an **evaluation** of the reserve’s relationship with a local community, or a **comparison** of its achievement with its original objectives or with those of another conservation initiative.

The topic must enable students to construct and support an argument from their own analysis of the information, rather than simply reporting others’ analysed data.

Some topics are unsuitable for ethical or safety reasons, such as those requiring experiments that might:

- inflict pain on living organisms
- cause unwarranted environmental damage

- put pressure on others to behave unethically.

Experiments that pose a threat to health, possibly using toxic or dangerous chemicals, or putting oneself at physical risk during fieldwork, must also be avoided unless adequate safety apparatus and qualified supervision are available.

Students must adhere to the [IB animal experimentation policy](#). They must familiarize themselves with this before undertaking an EE in environmental systems and societies.

The topic must have a sharp focus. If it is too broad, it will inevitably lead to a relatively superficial treatment that is likely to self-penalize the student from the start.

In topics that are too broad, it is unlikely that students will be able to produce any significantly fresh analysis, arguments or meaningful conclusions of their own.

## Examples of topics

These examples are just for guidance. Students must ensure their choice of topic is focused (left-hand column) rather than broad (right-hand column).

✓	✗
Focused topics	Broad topics
The ecological recovery of worked-out bauxite quarries in Jarrahdale, Western Australia	Environmental effects of mining
A comparison of the energy efficiency of grain production in the Netherlands and Swaziland	Efficiency of world food production
The comparative significance of different sources of carbon dioxide pollution in Nairobi and Mombasa	Impacts of global warming
Managing the environmental impact of paper use at a school in Quito (Ecuador)	Paper recycling

## Treatment of the topic

Students can investigate their question by:

- primary data collection, eg from fieldwork, laboratory experimentation, surveys or interviews
- secondary data collection, eg from literature or other media
- a combination of primary and secondary data collection.

If collecting primary data, the student needs to select appropriate methods to do this and carry them out effectively.

## Literature review

All students must demonstrate that they have engaged in background reading on their topic, regardless of their method of research.

## Primary data

Before beginning the investigation, students should read about the different methods of collecting data and any pertinent research that may give them guidelines and useful points of theoretical comparison.

Students' reading should be evident both in their essay and its bibliography. They can refer to what they have read to support their choice of methods or provide an academic context for their conclusions.

## Secondary data

If the essay is focused on secondary data, students need to ensure their sources are:

- of a sufficient quantity and range
- all reliable.

Students should use only those sources that have academic credibility, whether in print or online. Their bibliography should be substantial, not limited to just a few sources.

## Analysis

Whatever their sources of data, students must produce their own analysis and argue their own conclusions.

For some students this will happen more naturally if the essay is based on primary data.

If students are using secondary data, they must disregard any earlier analysis and conclusions. It is essential that students manipulate the data in their own way, or possibly synthesize it with other sources, in order to support their own research question.

## Using the systems approach

The systems approach is a central theme in the environmental systems and societies syllabus and this should be reflected to some degree in the EE. The essay should include an attempt to model, at least partially, the system or systems in question.

The term "model" in this context includes, for example:

- mathematical formulas
- maps
- graphical representations
- flow diagrams.

Students should also use the terminology from the environmental systems and societies course, where appropriate.

## Examples of topics, research questions and suggested approaches

Once students have identified their topic and written their research question, they can decide how to research their answer. They may find it helpful to write a statement outlining their broad approach. These examples are for guidance only.

Topic	<b>The ecological footprint of the school cafeteria</b>
Research question	What overall estimate of the environmental impact of the school cafeteria can be made in terms of an ecological footprint?
Approach	An analysis of records and practical measurements assessing the inputs and outputs of the cafeteria, and a synthesis of data into a holistic model indicating the environmental impact.

Topic	<b>Architectural sustainability and the future of Vancouver Island</b>
Research question	What forms of sustainable construction may be utilized in the future on Vancouver Island (Canada)?
Approach	An analysis of current sustainable building techniques and comparison of the environmental impacts of two options of sustainable housing.

Topic	<b>Revival of the gray wolf in the National Forest of Colorado</b>
Research question	Is the reintroduction of <i>Canus lupus</i> in the Pike and Isabel National Forests of Colorado (USA) possible, even with a significant cattle presence?
Approach	Presenting a potential reintroduction area and analysing, using secondary data, the viability of wolf introduction within the proposed area.

Topic	<b>Comparing air pollution levels between a rural and an urban area in the UK</b>
Research question	Is there a significant difference in air quality between central Cambridge and Sawston (UK)?
Approach	A fieldwork investigation using data loggers and probes to collect data. Comparison of the results with secondary data from different regions.

### An important note on “double-dipping”

Students must ensure that their EE does not duplicate other work they are submitting for the Diploma Programme.

### The environmental studies EE and internal assessment

In particular, an EE in environmental studies is not an extension of the internal assessment (IA) task. Students must ensure that they understand the differences between the two.

- For the IA there is a specific requirement to address a broad issue from the course and to develop a focused research question based on this issue. For the EE there is a greater emphasis on a detailed literature review that leads onto the research question.

- For the IA the findings of the study must be applied to offer a solution or proposal to address the broad issue initially identified by the student. This stage is not required for the EE.
- The IA is limited to a maximum of 2,250 words and therefore the scope of the investigation is smaller.

**Supervisors play an important role here in guiding students on these distinctions. Students risk their diploma if academic misconduct is detected.**

## Interpreting the EE assessment criteria

### Criterion A: Focus and method

(Strands: Topic, Research question, Methodology)

An EE in environmental systems and societies should focus upon the interaction of the natural environment and human societies. Students must ensure that the topic would not be better submitted under a subject area within the experimental or human sciences.

The topic should be precise and focused and clearly established in the research question, which must be posed as a question. For example, “The potential of residential solar power systems to meet the demands in Canberra, Australia” is better than “Efficiency of solar energy”.

The research question should not be understood as a statement of the topic but rather as a specifically expressed question that the research will attempt to answer. It leads on from the topic area chosen, for example: “To what extent can residential solar power systems meet the energy demands in Canberra, Australia?”

The question must encourage critical argument rather than a descriptive or narrative response.

Students should explain the significance of the research and indicate how the research question relates to existing knowledge.

They also need to demonstrate that the research has been well planned and that they have selected an appropriate approach to address the research question.

If the approach involves experimentation or practical fieldwork, a detailed description of the methodology used should be provided that would allow the work to be repeated.

The sources consulted must be sufficient and each must contribute to the research focus of the essay.

If the study is based on secondary data, students need to ensure that the selection of sources is wide and reliable. Students must be particularly aware of the potential unreliability of internet-based sources.

### Criterion B: Knowledge and understanding

(Strands: Context, Subject-specific terminology and concepts)