



# Earth Charter Curriculum Stimulus Material

## The Creative Arts

### Main Theme:

**Producing a creative response to a special place that has some personal meaning**

The Earth Charter Preamble states “*The choice is ours: form a global partnership to care for Earth and one another or risk the destruction of ourselves and the diversity of life. Fundamental changes are needed in our values, institutions, and ways of living. We must realize that when basic needs have been met, human development is primarily about being more, not having more.*”

Principle 14b notes the need to “*Promote the contribution of the arts and humanities as well as the sciences in sustainability education.*”

### Background:

The creative arts, like all other areas of learning, have a contribution to make in addressing our global environmental and social problems.

With the creative arts you can express your interest in, and concern for, the environment in ways that engage the heart as well as the head, emotion as well as intellect. Many of the things we value about a place cannot be measured by science but can find expression in art - for example the spiritual inspiration and renewal many people experience in a wild landscape or in a sacred site like a Mosque or a Cathedral.

To begin thinking about the future of Earth, a good starting point can be a place you know well. This place you have identified may currently, or in the future, be under threat - from local council development plans, pollution or even deforestation.

### Activities

- Find a place that is somehow special to you. This place can be as big or as small as you like, but should be a place you enjoy going to - and which makes you feel good.
- If possible revisit your special place, and think about what it is that makes it special to you.
- Undertake investigations to determine if there are current or future threats to it as a place of value to you. You may wish to contact your local council or an environmental scientist.
- Produce an artwork that expresses the value of this place to you with text that also alludes to any perceived threat, and show this to your friends.
- Expand your thinking to consider Earth as a special place, and think about what you value about Earth and the current or potential threats to these values.
- Produce a work of creative artwork that also incorporates text referring to any perceived threat, or art that expresses your views of Earth as a special place.
- For a visual artwork, there can be a text component integrated into or accompany it as a 'title' statement. If the creative artwork is a piece of music, then the text component could be the lyrics.



## Main themes:

# Languages and Literature

Can the written word inspire people to change their behaviour?	Are there universal concepts that can be translated into all languages?	Are there other styles and formats for presenting the Earth Charter?
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The Earth Charter Preamble concludes with the statement that “*We urgently need a shared vision of basic values to provide an ethical foundation for the emerging world community. Therefore, together in hope we affirm the following interdependent principles for a sustainable way of life as a common standard by which the conduct of all individuals, organizations, businesses, governments, and transnational institutions is to be guided and assessed.*”

## Background:

- The written word has played a powerful role throughout history in both informing people and motivating action to bring about change; declarations, novels and poems have been used as instruments of social change.
- There have been a variety of Charters and Declarations designed to articulate fundamental principles and inspire people to act accordingly; such documents can both inform and inspire.
- There has been much debate over the actual format and style of the Earth Charter, including issues such as whether it should be: long or short; written in a declaratory style, or in the form of imperatives; written in formal (legal) or poetic language?
- There also remains debate as to whether it is even possible to express principles in a way that can translate to all cultures; is there a limit to what language and the written word can convey? Some still contest that there are universal principles that are meaningful to all cultures.

## Activities

- Identify examples of the written word that have sought to inspire and motivate people, and that are considered landmark documents or statements.
- Examine the form and style of Charters and Declarations through history; examples include the Magna Carter, the US Declaration of Independence, and the International Declaration of Human Right; evaluate the format and style of the Earth Charter.
- Write an essay, poem, short story, play, lyric, or speech, that: (a) explains, illustrates or demonstrates one or more principle in the Earth Charter; (b) represents a statement of a principle in its own right; (c) constitutes an expression or reflection of environmental or social concern; or (d) inspires people to realize your vision of what Earth should be like in 25 years time.



## Mathematics/Economics/Biology

### Main themes

Measuring ecosystems	Quantifying our ecological footprint	What do we value about nature but cannot measure?
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The Earth Charter Preamble states that “*The resilience of the community of life and the well-being of humanity depend upon preserving a healthy biosphere with all its ecological systems, a rich variety of plants and animals, fertile soils, pure waters, and clean air.*”

Earth Charter Principle 5 argues that we should “*Protect and restore the integrity of Earth's ecological systems, with special concern for biological diversity and the natural processes that sustain life.*”

### Background

- The rate and extent to which Earth's environment has changed as the result of human activity has increased dramatically since the industrial revolution; humans have always affected their local environment to some degree, but the accumulated affects of modern technological society have now reached global proportions.
- Natural vegetation is cleared for agriculture, settlement and industry; the flow and quality of water is changing as land cover is transformed and water is drawn off for human use; human consumption of energy continues to increase; renewable natural resources are being over-harvested or mined; the chemical composition of the atmosphere has changed dramatically over the last 100 years, with subsequent changes in Earth's energy balance and climatic regimes.
- Natural variation occurs in the range of environmental conditions in the absence of humans and modern technological society; it is often difficult to determine whether a change in environmental conditions represents natural variation or perturbations caused by human activity. Accurate, quantitative measurement of the state of the environment is critical to understanding global change; this requires measurement of changes in environmental pattern (e.g. land cover) and process (e.g. water flow) in both space (e.g. aggregate loss of rainforest in Congo) and time (increase in area subject to desertification per year).
- Environmental impact assessment requires measurement of the costs and benefits associated with a development or activity; however many of the things we value are difficult if not impossible to measure in dollar terms; is there any way of measuring such values?

### Activities

- Activities should focus on quantitative measurement of the state of the environment and human activity relating to rates of change, absolute measures of change, relative and surrogate indices of change, and accumulated measures of change. For example, select a sample of economically rich and poor nations: compare on a nation-by-nation basis annual per capita energy consumption and carbon pollution; determine how much water each year is used for agriculture, industry and urban consumption; compare this to how much water is available for consumption; determine how much native vegetation is cleared in these countries each year, what this represents on a per capita basis, and the geographic distribution of this loss.
- Conduct an energy audit of your class, school or family, e.g. calculate how much energy is used, how much paper or plastic is consumed or disposed over; translate your environmental impact into energy units and give them a dollar value.
- List the ten things you most value and try and assign them a dollar value, i.e. how much would you be prepared to sell them for, or to pay if you did not already possess them; which things cannot, or would you not, do this for? What is a forest worth? Think about all the things that a forest ecosystem is valued for; which of these values cannot be measured in dollar terms?



## Science/Biology

### Main Themes

Is Earth Alive?	Earth as a “complex system.”	Humans and the Earth ecosystem.
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The Earth Charter Preamble argues that “*Humanity is part of a vast evolving universe. Earth, our home, is alive with a unique community of life. The forces of nature make existence a demanding and uncertain adventure, but Earth has provided the conditions essential to life's evolution.*”

### Background

- Science now views Earth as a complex system comprising, amongst other things, three closely coupled subsystems: the global biogeochemical cycles (especially, carbon, nitrogen, water); the global hydrological cycle; and the global climate system.
- Life emerged on Earth and continues to evolve, in so doing it has affected these major subsystems to make Earth's environment very different to what it would be if Earth was devoid of life; much of the environment is the result of biophysical processes; life and Earth's environment have co-developed, while life is dependent on Earth's environment, life helps to bring about the very conditions upon which it depends.
- While science is now comfortable with the concept of Earth as a “system”, there is still considerable debate as to exactly what type of system the Earth constitutes. Some argue that Earth is like a living organism, and that the various global systems, such as the biogeochemical cycles, can be thought of as “Earth's physiology.” Others say that it is sufficient to simply view Earth as being “full of life”, and recognize the close interdependencies between the biotic and abiotic elements.
- The British scientist Lovelock proposed the Gaia hypothesis which suggests that life functions as an active control system, maintaining Earth's environment in a state that is optimal for the persistence of life. Some have used Gain theory to speculate that Earth controls its environment on purpose, or to promote notions of the 'oneness of nature'. Others even have argued that Earth will “self-regulate” to counter the negative environmental impacts of human activity, i.e. “we don't have to worry about our environmental problems as Earth will fix itself.”

### Activities

- Examine to what extent the proposition 'Earth is alive' is supported by science. Can we reach a firm conclusion as to whether Earth is “alive” or more simply “full of life”? What are the characteristics of a living organism? Is the global carbon cycle a metabolic process similar to blood circulation in an animal? Does Earth have a life cycle consisting of birth, growth, death? Does something have to be capable of reproduction in order to be alive?
- What mechanisms can be identified whereby living organisms affect Earth's environment (e.g. vegetation and the water cycle; methane emission from anaerobic digestion in wetlands; CO<sub>2</sub> fixation and oxygen production by phytoplankton)? What is meant by a “feedback mechanism”? Compare the chemical composition of the Martian atmosphere with that of Earth's and account for the differences
- Find examples of ecological systems in the school and home environment (e.g. ant nests, termite mounds). What makes them a “system”? Build an ecosystem (e.g. soil, compost and worms). What external inputs does this ecosystem need to function (e.g. water, solar energy)? Identify the system “components”. Are there “emergent” properties (i.e. is the sum greater than the parts)?
- Consider how different scientific understandings of Earth influence how we value the non-human world.



## Technology/Social Studies

### Main themes

Is there a limit to the extent to which technology can replace ecosystems?	Technology can be either part of the problem or part of the solution.
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Earth Charter Principle 5b states we should *“Establish and safeguard viable nature and biosphere reserves, including wild lands and marine areas, to protect Earth's life support systems, maintain biodiversity, and preserve our natural heritage”*.

Principle 5d argues the need to *“Manage the use of renewable resources such as water, soil, forest products, and marine life in ways that do not exceed rates of regeneration and that protect the health of ecosystems.”*

### Background

- Natural ecosystems provide many goods and services, including: clean air and water; productive soils; protein (e.g. fish harvested from oceans, sheep production on native grasslands); fibre (commercial logging of timber from forests); and fuel (wood gathering by local communities for cooking and heating).
- These natural “goods and services” are generated by ecosystems that are “self- regulating” and “self- sustaining”. Humans can interfere in these systems such that they collapse or cease to function, e.g. when the pollution assimilation capacity of rivers is exceeded, or wood is extracted from a forest at a faster rate than it can re-grow.
- In order to have ongoing access to these natural goods and services, human activity cannot exceed the capacity of natural ecosystems to absorb the disturbances and impacts of resource use. These constraints define an “ecological corridor” within which human activity must operate. This ecological corridor can be defined in terms of both global (e.g. the atmosphere) and local (e.g. a forest) ecosystem processes.
- “Technological optimists” deny that such an ecological corridor exists, arguing that technological solutions can be engineered in substitution for any of the goods and services generated by natural ecosystems. Others argue that certain ecosystem functions cannot be substituted by technology, especially those that operate at the global scale such as atmospheric processes.
- Even if technology can provide substitutes for many natural goods and services, the question remains as to whether we should continue down such a path. Do we want to create a world where all life is dependent on machines?

### Activities

- Document goods and services produced by global and local ecosystems. Identify examples where technology has been used to provide goods and services that were once produced by local ecosystems (e.g. plantations; fish farms; water purification and water treatment plants). Could technology ever replace global ecosystem services such as maintaining the protective functions of the atmosphere?
- How much fibre, fuel and food are harvested from natural ecosystems? Could technology provide all of these resources if natural ecosystems no longer functioned? When is technology part of the problem (e.g. causing pollution, depleting of natural resources) and when is it part of the solution (e.g. producing goods with fewer raw materials, less energy, and reduced waste)?
- Imagine a world where the atmosphere no longer existed, and all humans lived under domed cities – a world where there were no wild populations of plants and animals. Is this kind of world for humans technologically possible? Is this kind of world one we would want to live in?