

LESSON PLAN — DESIGN FOR ECOLOGICAL SUSTAINABILITY

This unit provides an introduction to the concept of design for ecological sustainability. It demonstrates that clever design can help us to meet human needs whilst simultaneously reducing consumption of resources such as water, energy and materials. It also focuses on use of renewable energy and recycling of materials.

Learning outcomes

Students will be able to:

- describe the needs of all living things and the inputs and outputs associated with those needs.
- verbally differentiate between human needs and wants.
- discuss how the natural environment supports our economy and society.
- identify resources as renewable or non-renewable.
- explain characteristics of products that are ecologically sustainable.
- collaborate to plan an investigation.

Resources

- Poster — Shop for the planet
- Worksheet — Recycle It
- Worksheet — What do we need?
- Powerhouse Museum Sustainable Design Database
- *EcoLogic: creating a sustainable future*, by McEwen, S. Published by Powerhouse Publishing, 2004. Pages 1–8 , 27–36 and 81–82

Starting point

- In nature there is no such thing as waste. Everything gets recycled. In the carbon cycle, for example, the carbon keeps moving through plants, animals, the soil and the air.
- Design is a powerful tool for reducing the environmental impact of each person because it allows us to manage the use and reuse of resources.
- There are a number of ways to design for ecological sustainability.
 - reduce the volume of resources used by creating lightweight designs to minimise the amount of materials used in a product. For example: furniture
 - use energy from non-renewable sources such as fossil fuels. Use solar or wind power instead. For example: solar radio, solar charger
 - reduce waste. For example: use rechargeable batteries, and minimal, compostable packaging
 - reuse items. For example: give your mobile phone to someone else to use before recycling it.
 - use items made from recycled materials, and recycle them when you're finished with them. For example: beanie made from recycled plastic bottles.

Activities

- Ask students to identify the components of their environment. The list should include air, water, plants, animals, people, buildings, vehicles, clothing, food. The environment includes everything around us.
- Ask students to identify what humans need to survive (as opposed to what they want). The list should include air, water, food, clothing, shelter and other people.

- Ask students where all the things we use come from. All manufactured items are made from plants, animals and mined resources such as metals, stone, and oil. Most plastics are made from oil. A renewable resource is one that can be replaced eg fish, timber, but only if they are harvested at appropriate rates.
- Divide the class into small groups. Each group investigates the Powerhouse Museum's Sustainable Design Database for products that are well designed for sustainable use of water, materials or energy. Group representatives then report back to the class about why and how items they saw are beneficial. Alternatively, every student can select one product to investigate further and report back to the whole class.