

Topic 8

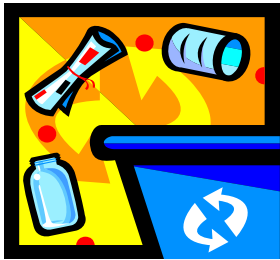
Environmental Stewardship



Topic 8: Environmental Stewardship

Introduction

The author and physician Lewis Thomas, once described the Earth as being “like a single cell.” Recognizing the relationships between all things on our planet is at the heart of the idea of environmental stewardship. Webster’s dictionary defines a steward as a person who acts as a supervisor or administrator for others. Under this definition, we are all stewards of the environment. None of us can own the environment, but we can take care of the resources that we use in our daily lives so that they remain for the use of others and future generations.



Recycling

Americans are producing more waste each year, most of which is taken to landfills. It is becoming more controversial to dig new landfills or to build new incinerators, and recycling is one way to cut down on the amount of trash we put in landfills. Getting rid of trash is expensive. Garbage trucks must pay to dump waste at landfills. This payment is based on the weight of the trash being deposited, and can be as high as \$65 per ton. By recycling more, we can reduce the cost we pay for trash services. Recycling reduces energy use by cutting down on the use of raw materials. For example, recycled aluminum cans use 95% less energy than creating cans from the raw materials used to make aluminum. Additionally, recycling aluminum cuts down on 95% of the air and water pollution associated with creating new cans.

Energy Efficiency and Conservation

The goal of energy efficiency and conservation practices is to reduce the amount of energy and resources used while maintaining the same level of service. Reducing water consumption, buying Energy Star appliances, replacing incandescent light bulbs with compact fluorescents, buying food from local markets, and driving a hybrid vehicle are all examples that you can easily implement to help conserve resource, reduce energy usage, and in some cases save money!



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Environmentally Friendly Vehicles



Hybrid cars feature a gas engine combined with an electric motor that assists the engine when accelerating. The electric motor is powered by batteries that recharge automatically while you drive. The electric motor that drives the hybrid can also slow the car. In this mode, the electric motor acts as a generator and charges the batteries while the car is slowing down. When a hybrid car is stopped in traffic, the engine is temporarily shut off. It restarts automatically when put back into gear. Hybrids have the potential to be two to three-times more fuel efficient than traditional gasoline engines and to reduce emissions. In addition, Hybrids have the potential of running on alternative fuels, which can be renewable and/or produced in the United States.

Smart Design

In the United States, buildings account for over one-third of all energy use and CO₂ emissions, and over two-thirds of electrical use. As a result, there is increasing recognition that the best way to reduce energy consumption and greenhouse gas emissions is at home. Simple steps such as planting shade trees on the south and west sides of a house can lower the indoor temperature by over 3 degrees. Installing skylights can provide free lighting in the day and passive heating in the winter. There are several benefits to implementing environmentally-sound or “green” building principles which can be broken up into three categories: Environmental, Economic, and Social:



Environmental Benefits

- Protect ecosystems
- Improve air/water quality
- Reduce waste
- Conserve/restore resources

Economic Benefits

- Reduce costs and bills
- Create new markets for “green” goods

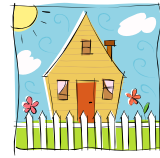
Social Benefits

- Improve occupant health
- Heighten aesthetic qualities
- Minimize strain on local infrastructure

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Teacher Discussion Questions

- 1.) Discuss with the students the different items they can recycle in their everyday lives, and the best method for collecting waste to be recycled. Additionally, ask them what they think about the recycling program at school. If one does not exist, how do they feel about that and what action do they believe they can take?
- 2.) Discuss with the students ways in which they can improve efficiency and reduce consumption at home.
 - a. *Examples might include using compact fluorescent bulbs, Energy Star appliances, flow limiters on water faucets, skylights to provide natural lighting, and turning the water heater down to 120F.*



- 3.) What advantages do hybrid engines have over traditional gasoline engines? Can the students think of any disadvantages to using current hybrid technology?
 - a. *Hybrids are more fuel efficient, produce less emissions, and can potentially run on renewable fuels such as ethanol, while “plug-in” hybrids can run off electricity from sources such as wind and solar. Possible answers for the disadvantages or misconceptions of hybrids could be that they are perceived as slower, they are more expensive, and that they require more specialized maintenance.*
- 4.) What are some “green” building practices one can use on a new home? What about existing homes?
 - a. *On new homes, untreated carpets do not emit the same hazardous vapors that treated carpets do. Environmentally-friendly materials can be used. Grasses and trees that require less watering can be planted.*
 - b. *Existing homes can be fitted with Energy Star appliances, shade trees to cool down the house and the outside air conditioning unit, cellulose insulation can be injected into the walls, and double-pane windows can be installed.*