



PROJECT LEAD THE WAY

**PLTW**

Igniting imagination and innovation through learning.

# Green Building and Sustainable Architecture

A responsible approach to  
environmental and human health

# Green Building and Sustainable Architecture

- What is Sustainability?
- Sustainable Design
- Principles of Sustainability in Architecture
- Sustainable Building Life Cycle
- Pre-Building Phase
- Building Phase
- Post-Building Phase
- Preservation of Natural Conditions
- Human Comforts
- Types of Green and Sustainable Buildings
- Sustainable Remodeling

# What is Sustainability?



**Sustainability** - Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

*World Commission on Environment and Development*

# Sustainable Design

Reduces the negative impact on the environment and human health, thus improving the performance during a building's life cycle. Careful consideration is given to

water, energy, building materials, and solid waste.



# Principles of Sustainability in Architecture

- **Economy of Resources** - Reduce, recycle, and reuse natural resources
- **Life Cycle Design** - Structured methodology for the building process
- **Humane Design** - Harmony between humans and nature



# Sustainable Building Life Cycle

- Pre-Building
- Building
- Post-Building



# Pre-Building Phase

- Site selection, building design, and building material processes, up to but not including installation.
- Examine the environmental consequences of the structure's design, orientation, impact on the landscape, and materials used.



# Building Phase

- Construction and operation processes reduce the environmental impact of resource consumption
- Long-term health effects of the building environment on its occupants are considered





# Post-Building Phase



Old materials become resources for other buildings or waste to be returned to nature. The sustainable design strategy focuses on reducing construction waste by recycling and reusing packaging and excess material.

# Preservation of Natural Conditions

An architect should minimize the impact of a building on its local ecosystem (e.g., existing topography, plants, and wildlife).



# Human Comforts

A building's design should enhance the work and home environments. This can improve productivity, reduce stress, and positively affect health and well being.



# Types of Green and Sustainable Buildings

- Homes
- Schools
- Commercial and public buildings
- Laboratories
- Health care facilities





# Sustainable Remodeling

Existing buildings can remodel and install improved mechanical components and update operating systems to make a building green.



# Introduction to Sustainable Architecture

- What is Sustainability?
- Sustainable Design
- Principles of Sustainability in Architecture
- Sustainable Building Life Cycle
- Pre-Building Phase
- Building Phase
- Post-Building Phase
- Preservation of Natural Conditions
- Human Comforts
- Types of Green and Sustainable Buildings
- Sustainable Remodeling

# Image Resources

Microsoft, Inc. (2009). *Clip art*. Retrieved April 7, 2009,  
from <http://office.microsoft.com/en-us/clipart/default.aspx>