

Art & the Environment

Lesson 3: Landscapes of the Future



Landscapes of the Future

What steps can we take to develop sustainability in our communities?

Duration:

2-3 Class Periods

Learning Objectives:

- Introduce students to the concept of sustainability.
- Develop an understanding of sustainable and non-sustainable practices.
- Explore scientific and technological solutions to contemporary issues

Materials:

- Smart board or computer to project images
- Student worksheets
- Materials from recycle bin for making models
- Craft supplies for making models (tape, scissors, markers, foam core, hot glue, etc.)
- One “land plot” per student or group (paper, cardboard, foam board, etc.)

Description of Lesson Plan:

Educator will lead a discussion about sustainability. Students will develop an understanding of sustainable development and be able to identify sustainable and non-sustainable practices. Students will work together to build a representational model of a sustainable landscape. This lesson provides students with the chance to explore challenges facing their communities and explore solutions in a scale model. Students will present their final designs to the class.

Schedule of Activities

Class 1- Students watch a short video about sustainability and discuss what sustainability means to them. Students learn about the impact they have on the environment. Teacher leads a short lecture about sustainability and principles of sustainable communities. Students brainstorm ways to make their community more sustainable.

Class 2-3- Working in groups, students construct a 3-D model of a new sustainable school complex. Groups present a 4-6 minute verbal presentation about their designs and how they incorporated the principles of sustainability.

What is Sustainability?

Required Materials:

- Smart board or computer to project images
- Student worksheets


Engage: Watch the short video “Sustainable Cities: Nature-Based Solutions in Urban Design” <https://vimeo.com/155849692>. Following the video ask students to state their definition of “sustainable” and examples of current issues identified in the video. You can create a list of responses on the board or can have them create a list in shared doc.

- Ask students “What would a sustainable community look like?” and create a list of responses.
- Have students brainstorm common sustainability challenges that communities face.

Explore: Ask students to think about the impact they have on the environment. Introduce the concept of a “carbon footprint.” Students can calculate their carbon footprint using an online calculator (ex. <https://www.conservation.org/act/carboncalculator/calculate-your-carbon-footprint.aspx#/> but many exist). Students can research/brainstorm ways they can improve their carbon footprint at home.

Explain: Use the “Sustainable Communities” Powerpoint to conduct a brief lecture about sustainability. Lecture focuses on principles of sustainability and how sustainable practices can be used in building/community design. Students will be able to identify sustainable vs. unsustainable practices.

Elaborate: Working in small groups, students brainstorm what it means to design a sustainable building. What issues must be addressed? How might they be addressed? Provide groups with a worksheet to guide the discussion. Following the discussion, introduce students to the general guidelines of the sustainable building project.

 As part of their preparation for the building project, students could be assigned homework to research your school’s carbon footprint. How much energy/water does the school currently use? How much waste is produced? What is the building made of? Is there a recycling program? Where does the cafeteria purchase the food from? Students could be encouraged to reach out to school staff who handle these issues (i.e. Buildings and Grounds, Cooks, etc.) to find the answers.

Evaluate: Most of the evaluation for this unit will be based on the final project, but students can be evaluated during the lesson based on participation or completion of assignments.

Following the discussion/brainstorm sessions, the project presentation guidelines are handed out so students can begin organizing their projects. Groups should be assigned or chosen at this point so students are ready to begin design project at the beginning of next class session.

Sustainable Design Challenge

Required Materials:

For hand-crafted models:

- Recycled materials or art supplies
- Craft supplies for making models (tape, scissors, markers, foam core, hot glue, etc.)
- Materials from home (if allowed)
- One “land plot” per student or group (paper, cardboard, foam board, etc.). Size determined by teacher.

Or

For computer-generated models:

- Presentation software or free computer-based design programs such as Google Sketchup. If this option is selected, note that more time may be needed to train students in procedural or other skills needed to use this technology.

Introduce Project: Announce to students that the Superintendent has just announced plans to build a new school complex for your district. The goal of the new complex is to create sustainable schools which meet the needs of every student in the district. The planning committee is accepting proposed designs for the new facility and that each student group has been tasked with creating their own 3-D design model to submit. Distribute Project Overview, Issues to Consider, and Presentation Guidelines hand outs.

Construct Models: Explain to students they will be using the provided materials to create the 3-D model of their sustainable school. Review the criteria for the projects and answer any questions. Give students their “land plots” (paper, cardboard, foam board, etc.). Give students time to create their designs.



You can control the size of their creations by giving students land plots pre-cut to a size.

Student Presentations: Once designs are complete, each group gives a 4-6 minute verbal presentation to the entire class. Groups will be evaluated on the overall quality of the presentation and how the design incorporates the principles of sustainability.

Issues to Consider for a Sustainable School

Location

- What is the climate of the area? How will this affect design and construction?
- How does the topography (landscape) of your town affect where you will build?
- How does the daily and seasonal movement of the sun affect where and how your school should be built?

Energy

- What energy source will your school use and why?
- What energy conservation measures will your school use and why?
- Is this source renewable or non-renewable?

Water

- How will your school get its water?
- How much water will you need for all the students and teachers?
- What will you do with your wastewater?

Building materials

- What materials will you use to build your school?
- Are these materials available locally?
- Are these materials “eco-friendly”?

Waste

- How will your school dispose of waste and trash?
- Will your school have a system for recycling?
- Will your school have a compost system for organic material?

Green Space

- How will you incorporate green space into the design?
- How much green space will there be and how much water will it need?
- What plants will you choose to grow?
- What will be the purpose of your green space?

Sustainable School Project

Project and Presentation Guidelines

Your final project is to create a 3-D model of a sustainable school and lead a 4-6 minute verbal presentation to the class about your design. Your final grade will be based on the overall quality of your design, presentation, and how well you addressed the following areas:

Building Design

- Does your model meet design requirements?
- Does it fit with the local environment?
- Did you find an appropriate location for the building?
- Does the design show creativity?

Energy

- How will you get power for the school?
- What measures did you take to conserve energy?
- Do these measures fit with the local environment?

Water

- How will you get water for your school?
- What methods of water conservation did you incorporate?
- Do you have an effective and appropriate plan to deal with wastewater?

Building Materials

- Did the design incorporate sustainable building materials?
- Do these materials fit the local environment?

Waste

- Did the design incorporate sustainable methods for handling waste?
- Do you have an effective system for recycling?

Green Space

- Did the design incorporate different forms of green space?
- What types of plants will be grown in the design?
- How much water would be needed to maintain the green space?