

Build a Sustainable Future: City Model Project

Standard:

- **Florida State Standards:**
 - **SC.6.E.7.1:** Explore and describe the importance of natural resources in sustaining human life and the role of technology in using and preserving those resources.
 - **SC.6.E.7.4:** Explain how human activities can impact the environment and the importance of sustainability.
 - **MAFS.6.G.1.1:** Find the area of right triangles, other triangles, and special quadrilaterals, and use these areas to solve problems.
 - **MAFS.6.SP.1.2:** Understand that a statistical question anticipates variability in the data related to the question.

A. TEACHER:

B. GRADE LEVEL: 6th Grade

C. SUBJECT: STEM/Science

D. DATE: [Insert Date]

E. DURATION: 3-4 class periods (60 minutes each)

F. LESSON FOCUS: Sustainability and Urban Planning through Hands-on Model Construction

G. MATERIALS:

- Recycled materials (e.g., cardboard, plastic bottles, paper, fabric scraps)
- Art supplies (glue, scissors, markers, paint)
- Measuring tools (rulers, tape measures)
- Technology resources (tablets/laptops for research)
- Whiteboard and markers for brainstorming sessions
- Poster board for presentations

H. LESSON OBJECTIVES:

1. Students will understand the principles of sustainability in urban planning.
2. Students will collaborate effectively in groups to design and construct a city model.
3. Students will apply scientific and engineering practices to create solutions for sustainable living.
4. Students will present their city models, explaining their design choices and sustainability features.

I. PROCEDURES:

1. **INTRODUCTION (15 minutes):**
 - Begin with a discussion about what sustainability means and why it is essential for our communities.
 - Show images or videos of sustainable cities around the world to spark interest.

- Introduce the project by explaining the goal of building a sustainable city model using recycled materials.
- 2. **EXPERIMENT (60 minutes):**
 - Divide students into groups of five. Each group will brainstorm ideas for their section of the city, focusing on renewable energy sources, green spaces, and eco-friendly materials.
 - Provide time for students to research and gather ideas about sustainable practices in urban planning using technology resources.
 - Distribute materials for construction. Each group will sketch a plan for their model before starting to build.
- 3. **OBSERVATION (30 minutes):**
 - As groups work on their models, circulate the classroom to observe the construction process. Encourage discussions about the choices they make and how those choices relate to sustainability.
 - Prompt students to reflect on challenges they face during the construction and how they solve them.
- 4. **GENERALIZATION (15 minutes):**
 - Bring the class together for a group discussion. Ask students to share their experiences, challenges, and successes during the project.
 - Discuss the importance of teamwork and how different perspectives contribute to the design process.
- 5. **ASSESSMENT (30 minutes):**
 - Each group will present their model to the class and explain their design choices, highlighting sustainability features.
 - Assess presentations using a rubric that evaluates creativity, understanding of sustainability, teamwork, and clarity of explanation.
 - Provide feedback and encourage peer assessment through constructive comments.

Note 1: Safety

Safety is crucial during this project, particularly when using scissors and other sharp tools. Remind students to handle all materials with care, keeping scissors pointed away from themselves and others. Ensure that all construction activities take place in a safe environment where students are aware of their surroundings and can avoid accidents. Encourage students to report any unsafe conditions immediately and remind them to keep the workspace tidy to prevent injuries.

Note 2: Accommodation

To support English Language Learners (ELL) and students with Exceptional Student Education (ESE) needs, provide visual aids and bilingual resources related to sustainability and urban planning. Use graphic organizers to help students outline their ideas and ensure they have access to additional support during group work. Pair ELL students with fluent English speakers for collaborative learning opportunities, allowing them to practice language skills in a supportive environment. Provide step-by-step instructions and allow for extended time as needed to accommodate different learning paces. Additionally, ensure that all group discussions are

inclusive, encouraging participation from all students regardless of language proficiency or learning needs.