

Sustainable Energy Facilitator Guide for grades 4-8

Overview:

Calling all designers, engineers and environmentalists! Join the 3DuxDesign journey to build sustainable communities of the future. In this project, students will reimagine their hometown powered by 100% renewable energy. Your learners will learn about electricity, compare a variety of circuit types, and explore sustainable energy sources. They'll identify benefits and drawbacks of each as they prototype, test, measure, collect data and draw conclusions.

Empowered with the knowledge and passion to create positive change, your innovators will put their skills to the test as they construct and light up the town!

Grades:

4-8

Time:

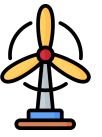
Allow 2-4 hours for electricity project, depending on depth.

Allow 2-4 hours for community design/build.

Allow 1-3 hours for optional extension: creating a presentation.

Goals:

1. Students will learn about electricity.
2. Students will build simple circuits with on/off switches. Option to build parallel and series circuits.
3. Students will learn about non-renewable vs. renewable energy sources and how they may relate to local environmental factors in their community.
4. Students may learn how to perform a scientific investigation by measuring voltage, collecting data, and drawing conclusions based on observations. Option for technology integration.
5. Student teams may apply what they learned to a real-world challenge as they design and build a model of their own community that runs on 100% renewable energy.



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6. Students may learn how to use a variety of technology tools to create a multimedia presentation to showcase their project and show evidence of understanding real world applications for renewable energy and applications for different electrical circuitry.

Materials:

1. 3DuxDesign GOBOX Classroom or 3DuxDesign GOBOX PRO
2. 3DuxDesign Sustainable Energy Accessory Kit includes 8 sets of:
 - a. (4) 5-volt LED Bulbs
 - b. (1) 5-volt solar panel
 - c. (1) 3 to 20-volt wind turbine
 - d. (1) on/off switch
 - e. Shared roll of copper tape
 - f. Rubber bands, double-sided adhesive tape
3. Student worksheets (downloaded from 3duxdesign site)
4. Blow dryer (2 if possible)
5. (8)3v lithium batteries or (16) AA if using the GOBOX PRO
6. Light source (natural may be adequate)
7. Site Map: 2-3DuxDesign Maps or taped paper to approx. 6'x6'
8. Optional
 - a. Scissors
 - b. Hole puncher
 - c. Crayons/markers/paint
 - d. Assorted craft materials
 - e. Student quizzes (downloaded from 3DuxDesign site)