

Green Challenge

Stage 1-Desired Results	
<p>Goals</p> <ul style="list-style-type: none"> • Students will use science inquiry and integrated activities to solve real-world environmental problems using alternative energy sources • Students will design experiments and collect data • Students will understand the difference between evidence and inference • Students will utilize deductive reasoning and problem-solving • Students will construct proposals that outline solutions for environmental problems that have resulted from the overuse of fossil fuels • Students will explore careers in alternative energy 	
<p>Understandings</p> <ul style="list-style-type: none"> • Inferences are based upon evidence. • Science can be used to uncover evidence. • Importance of team work in conducting investigations. • Systematic process to evaluate proposed solutions 	<p>Essential Questions</p> <ol style="list-style-type: none"> 1. What energy issues does the world currently face? 2. What are some alternative energy sources to replace those currently in use? 3. Which alternative energy sources are the most effective?
<p>Knowledge Students will know...</p> <ul style="list-style-type: none"> • The engineering foundation of design using science concepts to solve a task/problem. • The methods of science investigation. • Teamwork and cooperative learning strategies. • Scientific techniques for analyzing data, testing, revision and redesign of projects based on measurable outcomes. 	<p>Skills Students will be able to ...</p> <ul style="list-style-type: none"> • Conduct tests • Collect and analyze data • Make inferences • Work collaboratively to propose solutions • Evaluate solutions • Implement problem-solving strategies
<p>NJCCCS: 5.1.8.A. 1-3 5.1.8.B. 1-4 5.1.8.C. 1-3 5.1.8.D. 1-3 5.4.8.G. 1-2</p>	<p style="text-align: center;">21st Century Life and Career Standards 9.1.A-F</p>

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Stage 2-Assessment Evidence	
<p>Performance Tasks:</p> <ul style="list-style-type: none"> • Group activities • Science labs • Reading responses and discussion 	<p>Other Evidence:</p> <ul style="list-style-type: none"> • Student notebooks • Teacher observations • Student explanations • Student presentations
Stage 3- Learning Plan	
<p>Learning Activities</p> <ul style="list-style-type: none"> • Design and testing challenges • STEM activities • Debates on environmental scenarios • Science Investigations • Read and analyze science literature to evaluate the effectiveness of proposed solutions to environmental issues 	
<p>Resources:</p> <ul style="list-style-type: none"> • STEM kits (K’ Nex education Renewable Energy Kit) • Book : “Using STEM to investigate issues in Alternative Energy” • “Climate Change: Connections and solutions, Middle School”-Curriculum unit and website • Environmental Situation cards 	

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“Green Challenge”

Students will be encouraged to think critically about climate change and to collaborate on devising solutions. Students will learn about climate change within a systems framework, examining interconnections among environmental, social and economic issues.

Unit 1

- Students will be introduced to the basic phenomena related to climate change including the carbon cycle, the Greenhouse Effect, fossil fuels and renewable energy systems.
- Using *K’Nex Education Renewable Energy Kits* students will compare and contrast the power and efficiency that can be realized from wind, solar and water powered machines. Students generate electricity to operate models as they experiment with renewable energy systems. Groups of students will work simultaneously on projects of real-world significance as they learn about issues and concepts that will impact our future.

(6 Class periods/weeks)

Unit 2

- Students will use “Using STEM to investigate issues in Alternative Energy” resources and “Environmental Situation Cards” to consider a variety of environmental topics including global warming, air and water pollution, alternative energy sources, conservation, recycling and landfills, endangered species, green gardening, composting and hazardous waste and related current events, their role in the problem and suggest ideas for improving the situation as they examine each issue.
- Students will prepare a professional presentation outlining their viewpoint on climate change backed up by research and data collected during their experimentation of alternative fuel sources.

(2 class periods/weeks)

Unit 3

- Community members working in green careers will be invited to speak to students about opportunities that exist in their field and the course of study required to enter the field.

(2 class periods/weeks)