7th Grade Technology Education

The first focus of the 7th grade course is design, construct and test. They learn design aspects of a strong structure. They will build a Tower that has to first have functions as a windmill and pick up weight. The second purpose is to design a structure that will support 20 or more pounds.

The second focus is on alternative energy sources they will construct a Wind Turbine that has to power a light and they will take voltage readings and wind speeds from different distance from the fan. When they have their readings they will make a bar graph showing their results.

Course Information:

Frequency & Duration: Averaging 42 minutes; 5 days per week for 7 weeks

Text: Teacher prepared materials

Content: Tower/Windmill Duration: 4.5 weeks

	What makes a structure strong?
Essential Question:	
	Should structure move?
Skill:	 Describe how to design a strong structure. Describe how to use design elements for a structure Students will design a tower structure Students will construct a tower Students will test their designs
Instructional/Engagement	
Activities	
Assessment:	 Design a windmill blade Students will test their blade design by picking up weight Students will test their structure by supporting 20 or more pounds.
Resources:	Teacher prepared materials Video: Building Big Skyscrapers Video: Build em And Bust Them
Standards:	3.7.C Use of knowledge of material effectiveness to solve specific construction problems.3.2.7.C Know and use the technological design process to solve problems.
Vocabulary:	 Anemometer – an instrument for measuring and indicating the force or speed of wind. 2. Blade - An arm of a screw propeller, electric fan, or steam turbine. 3. Conductor - a material or object that permits an electric current to flow

easily. 4. Data - factual information such as measurments or statistcal information used as a basis for reasoning, discussion or caluculating. 5. Design – To creat or construct according to plan 6. Electron – an elementary particle consisting of a negative charge 7. Evaluate – to approximate the value, worth, or significance of something 8. Frame – a structure that provides support and shape 9. Generator – a device by which mechanical energy is changed into electrical energy by the movement of conductors through magnetic fields. 10. Graph – a diagram (as a series of one or more points, line segments, curves, or areas) that represents the variable in comparison with that of one or more other variables. 11. Induction – the movement of a conductor through a magnetic field, causing electrons to move in a conductor. 12. Kinetic – The forces of energy of motion. 13. Modify – to change 14. Motor – a rotating machine that changes electrical energy into mechanical energy 15. Multimeter – an electronic measuring instrument that has the ability to measure voltage, current and resistance. 16. Pitch – the angle of a propeller with respect to its plane of movement 17. Scientific Method – principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observations and experiments, and the formulation and testing of hypotheses 18. Speed – the rate of motion 19. Turbine – A device for transforming the movement of the wind into circular motion for the purpose of producing electricity 20. Variable – a symbol for a quanity that may assume any one set of values 21. Voltage Electric potential or potential difference expressed in volts 22. Velocity – rapidity of motion or operation, swiftness, speed 23. Wind – a natural movement of air of any velocity

Content: Turbine Duration: During the 7.5 weeks

	What are some renewable energy sources?
Essential Question:	What is a Turbine?
-	What kind of voltage does a Turbine produce?
	What find of voltage does a Parbnic produce.
Skill:	 Student will construct an Eco-Wind Generator Describe how the pitch of the blade effects both wind speed and voltage Students will use an Anemometer to test wind speed from distances of 18",36', and 48' from the fan Students will use a Multi-Meter to test voltages from the same distances 18', 36', and 48' from the fan
Instructional/Engagement	
Activities	
f Assessment:	 Students will design the Turbine blade Stunts will test their designs by lighting the bulb on the Turbine Students will create a bar graph showing how the distance from the fan effects the wind speed Students will create a bar graph showing how the distance from the fan effects the voltage
Resources:	Teacher prepared materials Video: Renewable Energy Video: Eco-Wind Gen
Standards:	3.2.7.B Apply process knowledge to make and interpret obsevations. 3.2.7.D Know and use the technological design process to solve problems 3.7.7.B Use appropriate instruments and apparatus to study materials.
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Vocabulary:	Same as Windmill

Comments: