

Wind Energy: The Turbine Design Challenge

Grade Levels 4-6

Program Description:

Students will investigate how wind can generate electricity using fans and small motors. They will view photos of various wind turbine designs to inspire them in creating their own prototype. Students build and test their models by measuring electricity generated. They then evaluate design features and plan for re-design.

Massachusetts Curriculum Standards:

Grade 4: Earth and Space Sciences

ESS3. Earth and Human Activity

4-ESS3-1. Obtain information to describe that energy and fuels humans use are derived from natural resources and that some energy and fuel sources are renewable and some are not.

Grade 4: Physical Science

PS3. Energy

4-PS3-2. Make observations to show that energy can be transferred from place to place by sound, light, heat, and electric currents.

Grade 4: Technology/Engineering

ETS1. Engineering Design

4.3-5-ETS1-3. Plan and carry out tests of one or more design features of a given model or prototype in which variables are controlled and failure points are considered to identify which features need to be improved. Apply the results of tests to redesign a model or prototype.*

4.3-5-ETS1-5(MA). Evaluate relevant design features that must be considered in building a model or prototype of a solution to a given design problem.

Grade 5: Earth and Space Sciences

ESS3. Earth and Human Activity

5-ESS3-1. Obtain and combine information about ways communities reduce human impact on the Earth's resources and environment by changing an agricultural, industrial, or community practice or process.

Grade 5: Physical Science

ETS3. Technological Systems

5.3-5-ETS3-1(MA). Use informational text to provide examples of improvements to existing technologies (innovations) and the development of new technologies (inventions). Recognize that technology is any modification of the natural or designed world done to fulfill human needs or wants.

5.3-5-ETS3-2(MA). Use sketches or drawings to show how each part of a product or device relates to other parts in the product or device.

Grade 6: Technology/Engineering

ETS1. Engineering Design

6.MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution. Include potential impacts on people and the natural environment that may limit possible solutions.



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