PennState College of Engineering | AEROSPACE ENGINEERING | KidWind PROJECT | PennState College of Education | CSATS Center for Science and the Schools

KidWind Challenge Workshop: Using Wind to Harness the Power of Young Minds

Presented by
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&
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CSATS

Saturday, December 7, 2019
9:00 a.m.- 2:30 p.m.

The U.S. has one of the largest and fastest-growing wind energy markets in the world[1]. In this workshop you will engage in hands-on activities that will introduce you to the science behind wind energy while putting easy-to-use tools in your hands. Activities from the workshop can be used to get your students excited about the KidWind Challenge, a wind turbine design contest for middle and high school students (scheduled for April 2020).

When students participate in a KidWind Challenge they will:

- **Discover the promise and limitations of wind energy technology**
- **Design, build, and test a functional, creative wind turbine**
- **Compete with their peers in a supportive environment**

Target Audience: Teachers of students grades 4-12

Teacher Benefits:

- This workshop is FREE to all educators with Act 48 credit available
- This workshop is aligned to PA State Standards, Next Generation Science Standards, and Common Core
- Continental breakfast and lunch provided by the Center for Science and the Schools (CSATS)

Maximum enrollment is 24. To apply visit csats.psu.edu

This workshop is sponsored by:
The Penn State College of Education
Center for Science and the Schools
182 Chambers Building, University Park, PA 16802

For more information, contact:
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1. https://www.energy.gov/science-innovation/energy-sources/renewable-energy/wind

Pennsylvania Standards

Grade 4	Grade 6	Grade 8	Grade 9
Math Standards			
CC.2.4.4.A.1 Solve problems involving measurement and conversions from a larger unit to a smaller unit.	**CC.2.1.6.D.1** Understand ratio concepts and use ratio reasoning to solve problems.		**CC.2.4.HS.B.5** Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.
English Language Arts Standards			
CC.1.5.4-8.A Engage effectively in a range of collaborative discussions on grade-level topics and texts, building on others' ideas and expressing their own clearly.			**CC.1.5.9-12.A** Initiate and participate effectively in a range of discussions on grade-level topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
Science Technology and Engineering Standards			
3.2.4.B2. Identify types of energy and their ability to be stored and changed from one form to another	**3.2.6B2.** Describe how energy can be changed from one form to another (transformed) as it moves through a system or transferred from one system to another system.	**3.2.8.B2.** Identify situations where kinetic energy is transformed into potential energy, and vice versa.	**3.2.10.B2.** Explain how overall energy flowing through a system remains constant. **3.2.P.B2.** Explain how gravitational, electrical, and magnetic forces and torques give rise to rotational motion.

Pennsylvania Standards

Grade 4	Grade 6	Grade 8	Grade 9
Science Technology and Engineering Standards			
3.2.4.B4. Apply knowledge of basic electrical circuits to the design and construction of simple direct current circuits Compare and contrast series and parallel circuits. Demonstrate that magnets have poles that repel and attract each other.	**3.4.6.B4.** Describe how electric current produces magnetic forces and how moving magnets produce electric current. Derive Ohm's Law through investigation of voltage, current, and resistance.		3.2.10.B4. Describe quantitatively the relationships between voltage, current, and resistance to electrical energy and power. Describe the relationship between electricity and magnetism as two aspects of a single electromagnetic force.
3.2.4.B6. Give examples of how energy can be transformed from one form to another.		**3.2.8.B6.** Explain how physics principles underlie everyday phenomena and important technologies.	**3.2.P.B4.** Explain how stationary and moving particles results in electricity and magnetism. Develop qualitative and quantitative understanding of current, voltage, resistance, and the connections among them. Explain how electrical induction is applied in technology.

NGSS Science and Engineering Practices

NGSS Science and Engineering Practices
Defining Problems
Planning and carrying out investigations
Analyzing and interpreting data
Designing solutions
Obtaining, evaluating, and communicating information