The University of Vermont GEORGE D. AIKEN Lectures



The UNIVERSITY of VERMONT
College of Engineering and Mathematical Sciences

THE 2009 DESIGN TASC / AIKEN CHALLENGE:

The Art and Science of Wind Energy!

Technology And Science Challenge, Kinetic Wind Sculpture & PSA Video

Wind energy has been used by people for more than 1,000 years to grind grain into flour, spin prayer wheels, saw lumber, and pump water. The paper that the declaration of independence was written on was made in a Dutch windmill. That machine is still making paper. One hundred years ago, the Vermont landscape was dotted with windmills used by farmers to pump water for homes and livestock. A key energy solutions question facing Vermont today is how does wind energy fit into Vermont's landscape now and into the future. We invite teams of students with interdisciplinary strengths to collaborate on between one and three projects: solving an engineering challenge, building a functioning and aesthetically interesting kinetic sculpture, or creating a Public Service Announcement that addresses Vermont's energy future.

Please visit the Design TASC website for more details: www.cems.uvm.edu/tasc
For more information about the Aiken lectures, please visit uvm.edu/aiken

DATES & PRIZES

All three events will be juried for prizes and exhibition by a panel of experts in their fields. Important dates:

May 1, 2009 Registration application available online at: **www.cems.uvm.edu/TASC/2009/registertasc2009.htm**

Oct. 15, 2009 Deadline for submitting middle and high school team registrations for one, two or three events

Dec. 5, 2009 UVM TASC/Aiken Challenge Exhibition—UVM Patrick Gym—tennis court areas

- For the video competition, you will be required to bring a DVD
- For the windmill competition you will be required to bring device, description and photos
- For Technology And Science Connection – you will be required to bring your device

Technology And Science Challenge (TASC)

CHALLENGE 1: WHAAM! Wind Harvesting for Automated Apple Moving. *Design and build a machine that harvests power from the wind (provided by a window fan) to move apples (plastic miniatures) from the "orchard" up a hill to the "farmers' market".

Parameters: Your team's score will be a measure of profit—the dollar value of the apples brought to market in five minutes minus the costs of materials and energy.

Criteria for evaluation:
Each team will demonstrate their machine and present a Design Review covering concept development, engineering challenges, test data and resulting design revisions, and analysis of final machine performance.

Teams will be asked to reflect on the evolution of their ideas and how they went about translating from rough sketches into working hardware.

Kinetic Wind Sculpture

CHALLENGE 2: Design and build a wind kinetic sculpture as well as a way of transferring the energy of the wind into mechanical or electrical energy or sound.

Parameters: Devices can be built in one of two categories: table-top or outdoor.

- Safety is of the highest priority. Sharp moving edges must be covered in duct tape. Any devices considered to be dangerous by the event organizers will be disqualified. The electric potential of all devices must be below 12 volts.
- Outdoor devices must have flat bases that can be secured with 5 lb jugs filled with sand or water for stability.

Criteria for evaluation:
- Solid and well-constructed
- Creativity of approach
- Visually exciting, including casts interesting shadows in motion
- Is functional (can pump water, etc.)

Public Service Video

CHALLENGE 3: Create a 30 or 60 second Public Service Announcement (PSA) that addresses the issue of wind energy in the Vermont landscape.

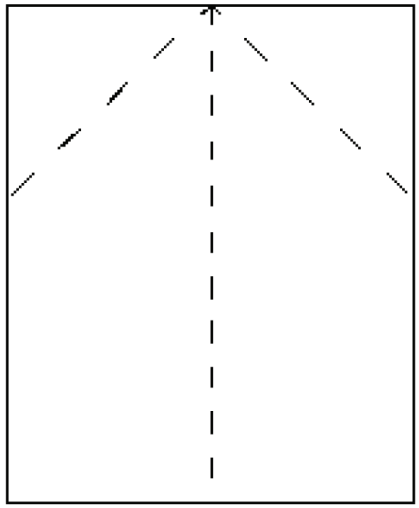
Parameters: Video pieces must be either 30 or 60 seconds in duration
- Can be color or B&W
- Can be narrative or conceptual
- Can be animation

Criteria for evaluation:
- Must have good visual and audio quality
- Must have clear message
- Inspirational and/or provocative

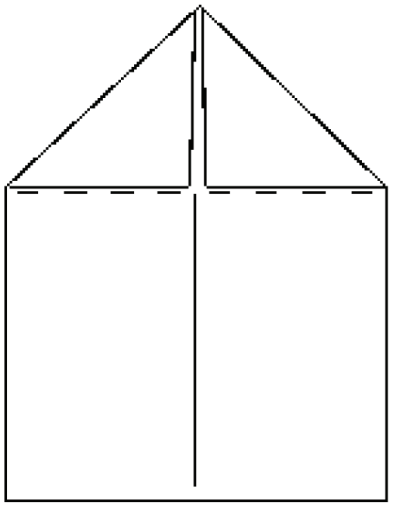
The Teams: We encourage students to work in teams where there is collaboration between "artists" and "engineers" to maximize the creative problem solving of this challenge.

paper glider instructions

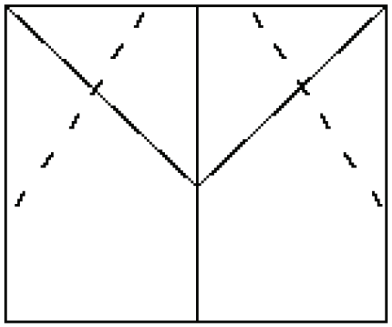
This is a very stable plane. It can fly straight with little adjustment. Curve the elevators up for loops.



Fold an 8.5 x 11 inch sheet of paper in half lengthwise and open back up. Fold the top corners down to the center.

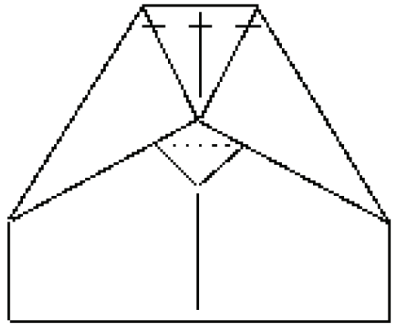


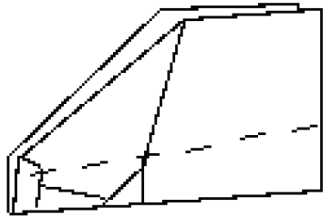
Fold the top down.



Fold the corners in to the middle.

Fold the little point up, fold the top 0.5 inch down, and fold the airplane in half away from you.





Now fold the wings out at an angle as shown.

Bend elevators up just slightly for better performance.