

DESIGN CHALLENGE: WHIRLING WINDMILLS

WHIRLING WINDMILLS:

Can you design and construct a windmill to harness the power of the wind?

Materials:

Tinkertoy rods (various lengths)

Sample windmill blades

Windmill hubs

Poster board

Cardboard

Cardstock

Foam Core

Styrofoam plates

Tools:

Prepared Windmill
Stands (PVC, motor,
wires, alligator clips)

Multimeters

Fans

Masking Tape

Scissors

- 1 ASK:** Explore the materials available. What materials are the lightest or strongest? What orientations and shapes are best? Test some of the sample blades on the windmills. How do they perform? Does the wind speed or number of blades make a difference?
- 2 IMAGINE:** Brainstorm different shapes and structures for your windmill blades. Think of many different possible solutions and discuss them with your team.
- 3 PLAN:** Pick two ideas you would like to design and test. Determine which materials you will use, how many blades you will have, and what shape and orientation they will be. Describe your designs on the back of this worksheet.
- 4 CREATE:** Construct your designs with the materials you have selected. Ask design challenges staff to help you test your designs! Be sure to test multiple wind speeds and record your observations on the worksheet.

FACILITATION TIPS

- Divide class into groups that test one variable of the windmill blade design (i.e. size, shape, etc., etc.). Students may graph results and a member from each group should present findings to the entire class.
- Please keep the students behind the windmill when testing since blades may fly off.
- If blades are not staying in the hub you may need to place a piece of tape at the end of the blade.
- Testing should initially just be done on the “low” setting of the fan but as a final test you may have the students compare their results to the “high” setting.
- For more ideas and information regarding the wind and for materials to build these windmills please check out the following website: www.kidwind.org