

Kinetic Sculpture

OBJECT

This activity will demonstrate the design process. Every day, engineers define problems, design solutions, build, test, redesign, and retest them, and then share the results.

GRADE LEVEL

Middle school.

THE CHALLENGE!

Make a sculpture that is at least six inches tall and has two parts that move in the wind. That's what makes it kinetic—it moves. But watch out...the wind might also knock it over.

MATERIALS (for each student or group)

- Electric Fan (*you only need one*)
- Ruler
- Cardboard
- Markers
- Ping Pong balls
- Poster putty
- Paper cups (*various sizes*)
- Scissors
- Wooden skewers
- Strips of colored paper or fabric
- String
- Masking tape
- Metal washers

BRAINSTORM AND DESIGN

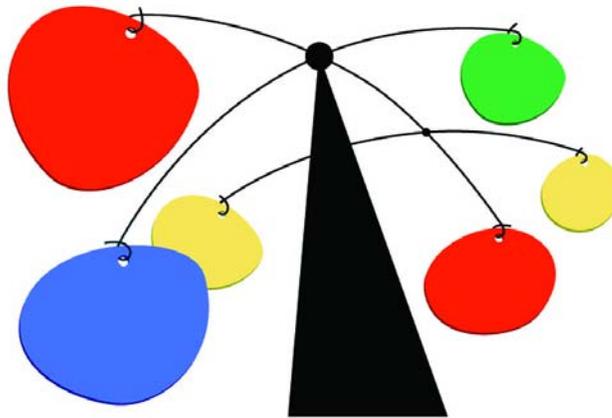
Distribute the materials. Encourage students to first think about what they could build, and then to make simple sketches or drawings.

BUILD

An artist usually gives his or her sculpture a name. Naming a sculpture can add meaning. Name your sculpture. Try for a name that's accurate, funny, poetic, or mysterious.

TEST

As students complete their sculptures, place each in front



of the fan. Does the sculpture get blown away or fall over? If it does, it's probably because of the **force**, the push, of wind from the fan. Ask students to think how they can **redesign** their sculpture. (*Tip: try giving it a wide or heavy base.*) But wind isn't the only force acting on the sculpture. Where the sculpture's weight is located affects how it stands. If

most of the weight is at the top it may tip over. If most is at the bottom, it may stand better.

REDESIGN

When the sculpture is standing tall and secure, ask the students if they can...

- add another moving part?
- make their sculpture taller?
- make it work in a different amount of wind?

CONNECT TO ENGINEERING

What if a sculpture had to stand up in typhoon-strength winds (74 miles per hour or greater)? That's one of the things the engineers who built the Taipei 101 Tower of Taiwan (one of the tallest buildings in the world) were worried about—very worried. Typhoons regularly blow into Taiwan, so they designed a building that is much wider at the bottom than at the top to help it resist being blown over. They also used special materials, including strong, flexible steel to make the building sturdy enough to withstand those typhoons.

This activity is adapted from the *Design Squad* Event Guide.

<http://pbskidsgo.org/designsquad/engineers>

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