



American Red Cross

BUILDING A HURRICANE PROOF HOUSE

DAY 1: DESIGNING YOUR HURRICANE PROOF HOUSE

Students

During the 1998 Hurricane Season the State of Florida experienced several storms that damaged 7,895 homes. Building homes that could better withstand the winds from hurricanes will be a consideration in all future housing starts. Your task is to design and build the most wind resistant building you can construct, using the materials provided. Your home must include at least 2,000 cubic centimeters. It can be any shape. **GOOD LUCK!**

Materials

- Two sheets of construction paper will be used for the main construction. (You may purchase any extra sheet of paper for 5 points to be deducted from your final grade)
- Four straws, glue stick and .6 cellophane tape will be provided. A styrofoam tray (turned upside down) will be used for the base only.

Team Work

- Each team will design and construct it together.
- List the science principles and construction ideas involved in designing your Hurricane Proof House on the Construction Team sheet.

Day 2: Building your Hurricane Proof House

Build House

- Draw the top and side view of your house.
- Calculate the volume:
Formula for volume for a rectangular solid or cylinder is area base x height.
Formula for any cone or pyramid shape is 1/3 the volume of original shape.
Formula for a sphere is $\frac{4}{3} \times \pi \times r^3$ ($\pi = 22/7$)

Day 3: Grade

Safety

At any time, unsafe behavior will result in your being fired from the construction team. (Grade = 0%)

You may only use materials provided.

- 10 points - Neatness
- 10 points - Use of Materials: Effective use of materials. Use as much as possible with now waste.
- 20 points - Design: Includes 1) top view drawing (with actual dimensions), 2) side view drawing (with actual dimensions) and 3) a list and description of the science principles you used in the design of your house.
- 20 points - Correct calculation of volume (Minimum of 2,000 cubic centimeters)
- 20 points - How it withstands the "wind".
- 20 points - Cooperation of the construction team: From the designing stage to building to hurricane occurrence, all team members will cooperate with each other. Each will do his/her part to make the building a success.
- 5 bonus points - For the team whose house withstands the MOST wind.

Construction Team Sheet

Science Principles Used and Calculation of Volume

Top View

Side View

To test the house, a leaf blower will be turned on at 10 feet away from the house (a tropical storm) then up close (a category 1 Hurricane). The house is then exposed to the leaf blower from all sides. This is done because hurricane winds eventually hit every side of the house as it passes over.