

Name \_\_\_\_\_

# ENGINEERING A HURRICANE PROOF HOME

## 8.4.5 Extension

**Introduction** – Homes all along the Atlantic and Gulf coast are susceptible to wind damage during a hurricane. Some hurricanes can top 150 mph. After the devastation of the last hurricane, home builders in the region have been forced to meet the demands of homeowners and build more damage-resistant housing. You are the lead architect for the largest home builder on the Texas coastline. Your task is to design a home that can withstand hurricane force winds, yet still appeal to homeowners. You will have to be budget conscience with your design and have a home strong enough to stand up to the deadliest hurricanes. Where will you focus your efforts? How will you spend your money? How can you innovate from current designs? Your challenge is a tough one, but this is your moment to shine.

**Requirements** – Your house must have

Walls  
Roof  
1 door  
2 windows  
1 foundation – no smaller than 10 x 13 cm but no larger than 12 x 15 cm.  
Must be built on the property (a cookie sheet)

**Supplies** – your team may choose any combination of the following supplies to build your house.

popsicle sticks	\$3,000 each	plastic wrap	\$2,000 each
straws	\$2,000 each	masking tape	\$3,000 meter
pipe cleaners	\$1,000 each	glue stick	\$8,000 1 stick
regular paper	\$7,500 sheet	clay	\$4,000 square inch
construction paper	\$10,000 sheet	paper clips	\$2,000 each
paper plate	\$15,000 each	scissors	\$1,500 each
Ruler	\$3,000 each		

**Research** – Use a chrome book and complete a quick google search on hurricane proof homes.

1. What is the difference in structure between a hurricane proof house and a regular house?
2. What are some things engineer's add to houses to make them hurricane proof?

**Design (drawing)** – In the space below, draw your design and label materials you are using in the hurricane proof home you are going to build.

**Purchase Order** – Create a small purchase order to be turned into the supply manager (teacher). Remember you must remain under budget, save some money to use later to rebuild your model.

**Budget \$** \_\_\_\_\_

Item Description	Item Cost	Quantity Ordered	Total Cost
<b>Total Cost</b>			

**Build**– Once your purchase order has been approved by the teacher, start building the model. If you need extra supplies you may purchase them from the teacher. Remember, you must meet all of the requirements for the home to be able to test it.

**Test** – Test your design by placing your hurricane proof home (it needs to be sitting on the cookie sheet) then place in front of the fan and set the timer for 60 seconds and begin the test. Make sure you observe how the wind affects the home to help make improvements

1. Did your house withstand the wind from the fan?
2. Where did you notice weak areas in the design?
3. Where did you notice strong areas in the design?

**Rebuild** – Reuse your supplies and if there is money still in the budget, you may purchase more supplies to rebuild your hurricane proof home and improve your design.

**Retest**– Retest the new and improved design.

1. Did your hurricane proof home survive the fan during the retest? Explain what happened
2. What changes did you make to your design?
3. What improvement would make your design even better?
4. How well did you work with your group?
5. What are some benefits from working with different people on engineering projects like this one?
6. What are some creative risks you took to make the hurricane proof home look better?