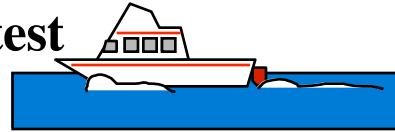




Name: _____

Per: _____

Mousetrap Boat Contest



WHAT: Make a mousetrap boat travel as far as possible for the cheapest cost. Also, write an engineering report that includes items, costs, explanations, calculations, and a graph.

WHO: 8th grade science students. There can be from 1-3 people in a group from your class only.

WHEN: Boats are due and will be raced on _____

WHERE: This is an out of class assignment. The boats will be tested on school grounds.

POINTS: 80 points

RULES: The rules must be strictly followed or you will receive no credit on your project. If you do not turn in the report as well as the boat, you will receive no credit. Follow these rules carefully!!

1. You must use a single mousetrap to power some form of boat. The spring of the single mousetrap can be the only source of power for the boat. It needs to be a Victor® brand mousetrap so it is fair to everyone. No rubberbands or balloons allowed.
2. The mousetrap is part of the design and must travel with the boat. No parts can be left behind at the dock.
3. The design must not exceed 30 cm in length, width, or height at any time while the boat is at rest or moving.

MATERIALS: You will provide all materials, including the mousetrap. Remember, this is not a contest to see who can spend the most! It is a contest to see who is the best engineer. Keep a list of parts and costs for your engineering report. Good engineers produce the best product for the lowest cost!

PARENTS: Many of you will receive extra help from your parents and that is fine. Remember, it is your project and should be built from your ideas. Your parents should most definitely supervise you as much as possible. A fun contest would be for your parents to build their own boat and race it with us.

SAFETY: These mousetraps are not toys!! The springs are strong and can hurt your fingers. Use good common sense and avoid injury to your fingers.

RESPONSIBILITY FOR BOATS: When your boat is at school it is YOUR responsibility to keep it safe. Carry it in a box. Do not leave it unattended in the classroom.

BOAT GRADING: 40 points of your grade will be based on how far your boat travels. Look at this scale:



- Above 5 meters = 38 points A
- 3.00-4.99 meters = 34 points B
- 1.50-2.99 meters = 30 points C
- 0.50-1.49 meters = 26 points D
- Illegal design or < .5 m = 0 points F
- Class champion = 2 points extra credit
- School champion = 10 points extra credit
- Best engineer in class = 5 points extra credit
- Best engineer in school = 10 points extra credit

0 m	0.5 m	1.5 m	3.0 m	5.0 m	
Start	F	D	C	B	A

ENGINEERING REPORT: 40 points will be from the report you turn in. The report must be neat and organized. It must have all of these parts:

1. A list and total of all items and costs to make the boat
 - a. Each piece of household material "junk" will have a value of 10 cents. For instance, if you used 10 bolts, 1 piece of wood, 3 screws, and a piece of metal, your cost would equal 150 cents.
 - b. The mousetrap is worth 50 cents. If you break it, you'll need another Victor® brand mousetrap.
 - c. Anything you buy must have a receipt. Remember to turn them in with your report.
2. The calculated cost per meter of your boat. This is the total cost divided by the distance your boat traveled. It must be in cents per meter.
3. A one page, detailed explanation of why you built the boat the way you did. This explanation must be typed. Discuss the following:
 - a. What you used to make it float.
 - b. How you propelled it forward.
 - c. What you did to make it go straight.
 - d. What you did to reduce friction.
 - e. Which person in the group did what to help out.
4. Calculations *with work shown* for the following:
 - a. The average speed of the boat.
 - b. The average acceleration of the boat.
 - c. The mass of the boat in kilograms.
 - d. The force that pushed the boat forward (use the formula $F = MA$).
5. A speed graph of distance in meters versus time in seconds. You are responsible for writing down your distance and time from the timekeepers during the race. Use this data for your graph!

