

## Activity 1

### Mousetrap Vehicle

#### Introduction:

If you have ever had your finger caught in a mousetrap you realize the potential power of the spring! Realize that this is a great amount of force and torque released in a very short period of time. Since the beginning of time man has used the spring as a useful tool to do many tasks for him.

You are going to become an inventor and using a standard size mousetrap design, construct and test a terrestrial vehicle using the mousetrap as the propulsion device. You must also be concerned with the control and guidance systems of this terrestrial vehicle. Obviously the structural and suspension systems also play an important role in this new type of experimental vehicle.

#### Assignment:

You are to design, construct and test a vehicle propelled by a mousetrap.

#### Rules of the Competition:

1. Use only standard mousetraps. (These are provided)
2. Only one 180-degree swing of the mousetrap flipper for propulsion.
3. You may extend or shorten the flipper.
4. You may use any materials you wish in its construction.
5. Competition consists of three tries, the better of which is to be used for grading.
6. Judging of distance and straightness is to be done at the completion of the vehicle linear travel. (See point breakdown for competition)

#### Put on your thinking cap!

1. What material and size of wheels should I use? Should it have wheels?
2. What about traction?

3. What about friction?
4. Should I lengthen or shorten my flipper arm?
5. How can I transfer power for propulsion?
6. Which is more important for propulsion release: Speed or Torque?
7. What is momentum and how can I use it effectively to extend potential power?
8. How can I use simple machines to convert the energy?

Good Luck! Remember to try different ideas and to keep track of your success or failure. With a little scientific/technological know how you should come up with some good ideas.

# POINT BREAKDOWN FOR COMPETITION

<u>DISTANCE</u>	<u>POINTS</u>	<u>STRAIGHTNESS FROM CENTERLINE</u>	<u>POINTS</u>
1 Foot or less	0	6 inches or less	5
2 Feet	1	10"   "   "	4
4 Feet	2	12"   "   "	3
6 Feet	3	14"   "   "	2
8 Feet	4	16"   "   "	1
10 Feet	5	More than 16 Inches	0
12 Feet	6		
14 Feet	7		
16 Feet	8		
18 Feet	9		
20 Feet	10		

## RECORDING CHART (record points)

	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>
Distance	_____	_____	_____
Straightness	_____	_____	_____
TOTALS	_____	_____	_____

Record largest total on GRADE SHEET!

## Mouse Trap Vehicle

### Grading Criteria

- |                              |        |
|------------------------------|--------|
| 1. 3 thumbnail sketches      | 15 pts |
| 2. 1 final sketch            | 20 pts |
| 3. Construction of Vehicle   | 20 pts |
| 4. Distance and Straightness | 25 pts |

Total points= 80