

JUNK BOX WARS

ZOOM MACHINES

Goal:

To create a "Zoom Machine" that will travel 4m in the shortest amount of time.

Competition Rules:

Each team will be provided with a junk box filled with materials that could be used to create your zoom machine. Each team will receive only one set of materials. Your team may use all or part of the materials in the junk box and are not allowed to share materials with other teams. All unused materials should be saved in case repairs are needed during competition.

Teams will be allowed time to build and test their machine. Competitors are allowed to bring diagrams and research to help them build their machine. After the time is up, all machines will be impounded and no changes will be allowed.

Zoom Machine Requirements:

Your machine must be powered by the energy stored in the rubber band(s) and may not be aided by a helping hand or other energy source. You may not propel the machine by a slingshot method.

Testing Procedure:

Each team will be allowed 5 minutes to "power up" their machines. No electric winders are allowed. Teams are not allowed to rewind the rubber band during testing.

Each team will be allowed two trials with 10 minutes allowed between trials to "power up" the machine and to make repairs or adjustments using materials left over from construction. No new construction or major design changes are allowed.

The best time out of the two trials will be considered for final results. If the car fails to make it to the finish line or goes out of the track area, no points will be awarded for that trial. The lightest machine will be declared the winner in case of a tie.

Possible Supplies:

CDs

Dowel rods

Pencils

Straws

Spools

Film canisters

Rubber bands

Plastic containers

Milk cartons

Masking tape

Glue

Index cards

Paper

Pipe cleaners

SAMPLE SCORE SHEET



ZOOM MACHINE Score Card

Team Members: _____

Mass of machine = _____ g

Trial 1 Time = _____ sec

Trial 2 Time = _____ sec

Assessment:

1. Rank order of fastest car. (10 pts)

- Winner 12 pts**
- Next 2 10pts**
- Next 3 9pts**
- Next 3 8pts**
- Last 2 7pts**

2. Machine Moves (5 pts)

3. Use of class time, proper safety, etc. (5 pts)

4. Ingenuity of design/approach. (10 pts)

5. Planning Log-Documentation of the thinking that went into your choice of design: control of variables, theoretical basis for design decisions. This will be your portfolio component for the project. (20 pts)

6. Self and Group Evaluation (10pts)

Competition Timeline:

July 9 – Introduction to Project - Receive junk box

July 12 – Brainstorm & Research due

July 12-13 – Time to work on project during class

July 14 – COMPETITION Day



Names:

ZOOM MACHINE Planning Log

Stage 1: Brainstorming

Write down any ideas that you have about how to complete the challenge successfully. Include sketches and materials you have in mind.

List variables that you think you need to control? How are you going to control these variables?

Stage 2: Research

Find out what there is to know about this challenge.

1. Write down questions you want to research. (How does a car get power? What can I do to give the car power? What type of energy will it have?)
2. Do the research and record what you learn.
3. Go back to Stage 1 and in a **different color**, make any changes/additions to your original ideas after learning this information.

Stage 3: Design

1. Make drawings and identify the materials you will need to make your apparatus.
2. Come back to this design and make changes in a **different** color while working on Stage 4.

After Stage 4 and editing your drafts above, sketch the final version of your design below.

Stage 4: Construction and Testing

1. Construct your design.
2. Carry out trials and record the raw data from your trials below (include date of trial).
3. After each trial, write one suggestion to improve your design.
4. Then go back to Stage 3 and make changes/additions to your design in a **different color**.

ZOOM MACHINE PROJECT RUBRIC



ZOOM MACHINE Score Card

Team Members: _____

Mass of machine = _____ g

Trial 1 Time = _____ sec

Trial 2 Time = _____ sec

Time Rank (Circle one):	Overall Winner	12pts
	2nd – 3rd Place	10pts
	4th – 6th Place	9pts
	7th – 9th Place	8pts
	10th – 11th Place	7pts

Machine Moves (out of 5 pts): _____

Safety, Use of time, etc (out of 5 pts): _____

Documentation (out of 20 pts): _____

Ingenuity of Design/Approach (out of 10 pts): _____

TOTAL GROUP POINTS (out of 50pts): _____

Comments:

*** Self and group evaluation separate



ZOOM MACHINE
Group and Self-Assessment

In each of the 2 categories, give a score (0-5) **and comment** on why the score is deserved.

Names (Your name first)	Comment on work completed & time spent (5pts) (1= negligible contribution, spent little time on tasks, relied totally on others. 5= went above and beyond on their part of the project)	Score	Comment on Teamwork & attitude (5pts) (1= tardy, no enthusiasm held the team back. 5= went above and beyond, helped others, brought a positive attitude to the project, led by example)	Score	Total Points