

Name: _____
Group Members: _____
Group Name: _____

Build a Powered Vehicle

End of Semester Project

Purpose:

To design a powered vehicle that uses several energy transformations and several simple machines. Your vehicle will be expected to travel at least a distance of 2 meters while following the state constraints below.

Instructions:

You must build a vehicle that will travel a distance of 2 meters. You will be able to choose your own source of energy as well as design. You may need to bring materials from home but you must follow the requirements listed below. Within your group you must designate specific jobs to each member. They must have a Job Title and must have a Job Description. An example is below.

Requirements for Vehicle:

- Your vehicle must be built from common materials. No motors or existing vehicles (whole or parts) may be used.
- Your vehicle can use chemical energy but is not allowed to use a battery
- The vehicle must travel at least two meters across a straight course
- All parts of the original vehicle at the start of the race must cross the finish line. No pieces can be left behind on track.
- You may choose to design your vehicle for speed, distance or both.
- You must use at least two different simple machines. A chain of at least two types of energy must be used to power your vehicle. (Use chapter 4.2-4.4 in your book if you have forgotten what this means)

Objects you will be provided:

- | | |
|---|--|
| ● <u> </u> CD's | ● <u> </u> Baking Soda |
| ● <u> </u> Washer's | ● <u> </u> Vinegar |
| ● <u> </u> Adhesive putty | ● <u> </u> Antacid Tablets (must ask teacher for use) |
| ● <u> </u> Rubber Bands | ● <u> </u> Balloons |
| ● <u> </u> Bamboo Skewer (Wooden Stick) | ● <u> </u> Water Bottles |
| ● <u> </u> Masking Tape and Packing Tape | ● <u> </u> Pinwheels |
| ● <u> </u> Cardboard or Foam Board | ● <u> </u> Paper |

Possible Sources of Energy

- **Rubber Band:** Kinetic Energy- When you pull it tight, then release it

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- **Baking Soda and Vinegar:** Chemical Energy- When you combine, gas is released
- **Antacid Tablets in water:** Chemical Energy- When you combine, gas is released
- **Water Bottle:** Gravitational- when squeezed the bottle and water is released
- **Pinwheel:** Mechanical- When you blow air onto it and the blades move

Group Contract and Job's

Group Contract:

Your group should review the following contract and negotiate how you will complete it. Fulfillment of these contractual obligations will be part of your project participation evaluation. Each member of the group needs to complete the contract.

Group Policies:

Be sure to answer the following questions:

1. What process will you use to resolve differences of opinion about your project?

2. How will your group ensure that everyone is participating and contributing to the project equally and efficiently?

Group Job's:

Student's Name	Job Title	Description of Job	Duties of Job
Example	Vehicle Design	The designer is in charge of handling how the car will look	Draw diagram of design and get it approved by team members. Gather materials for car. Put the car together.

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Element	1	2	3
Safety	The Design of the car is not safe, safety measures following the safety contract were not followed	Car design is somewhat safe, but the safety measures following the safety contract were not followed	Car has safe design, and all group members followed the safety contract.
Car Design	No creativity, car does is unable to move. Or materials did not follow requirements of project.	Car works and is functioning but is not creative Or some materials did not follow requirements of project	Creative design and functioning car
Energy Sources	There are no energy sources used on the vehicle or the energy source used was not approved by Ms. Lowery	Only one energy source was used or the only one of the energy sources were approved.	Two or more energy sources were used and were approved by Ms. Lowery
Energy Transfers	There were not any energy transfers	There was only one energy transfer	There were two energy transfers

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Distance Traveled	Car did not travel at all	Car traveled less than 2 meters	Car traveled 2 or more meters
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Rubric for your Vehicle

