Name: _____

Wheels & Levers

Date: _____

How Can You Build a Machine or Device That Moves on Its Own?

Discover: Building a Device or Vehicle that Can Power Itself

Question

How can you build an energy-supplied vehicle that can move on its own?

In this activity, you will use your design skills to build a vehicle that has moving parts and uses an **energy** source so that you do not need to push or pull it yourself.

Resources

Access the website links from the online course.

- Toy construction kit such as K'nex or similar type of kit
- Various common home materials (The materials depend on the design of the vehicle you decide to build.)
- Balloons or moustraps
- Optional - a purchased vehicle model kit
- Optional - digital camera or video camera

Gather Ideas!

View the following **YouTube** movies and websites. Watch, listen to, and read the information carefully. All are meant to provide you with ideas for building your own energy-supplied vehicle.

- Weekend Project: Mousetrap-Powered Vehicle (website)
- Louvee Air Car (website)
- Balloon-Powered Cars (website)
- Balloon Rocket Car Project (website)
- Balloon-Propelled Car Races (website)
- How to Build a Mousetrap-Powered Car (website)

Instructions

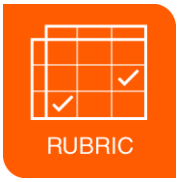
1 Choose a design of energy-supplied vehicle you would like to build. You may build a vehicle similar to any of the designs you have seen in Step 1, or you can design something new of your own. There are only three rules:

i Your design must include moving parts.

ii Your design must use an "on-board" energy source so that is can move on its own. The energy source should be from air (such as a balloon) or a mousetrap.

iii Safety first! Be careful when you are building and testing your energy-supplied vehicle.

Safety Warning: Whatever you build, you must do so **safely**. Protect your eyes. When you are using anything sharp, be very careful and never cut toward yourself. Mousetraps should be handled with care; do not let them snap on your fingers.



Rubric

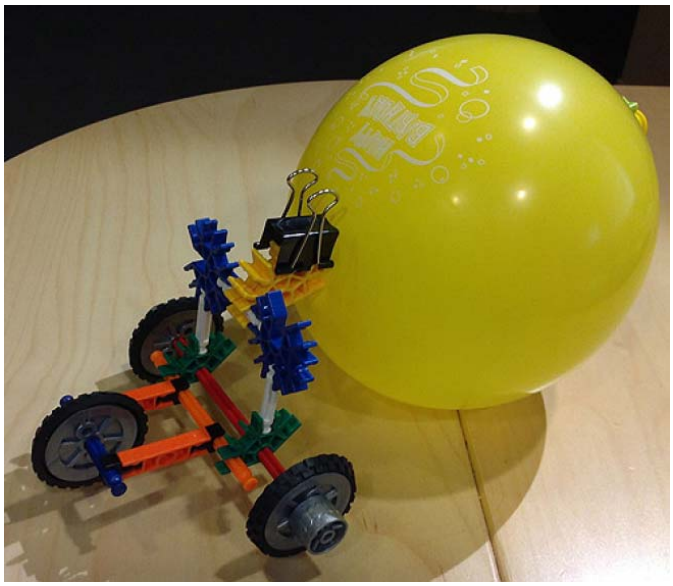
Before you begin building, be sure to read the **Energy-Supplied Vehicle Rubric** so that you know what is expected of you.

Energy-Supplied Vehicle Rubric

Criteria	Excellent	Proficient	Adequate	Limited
Communication and Understanding				
I will design an energy-supplied vehicle and explain clearly how it works.	I have explained very clearly how my vehicle works.	I have explained clearly how my vehicle works.	I have explained how my vehicle works, but my explanation could be clearer.	My explanation for how my vehicle works is unclear and needs lots of improvement.
I will design an energy-supplied vehicle and explain clearly how the energy supply makes it move.	I have explained very clearly how the energy supply makes my vehicle move.	I have explained clearly how the energy supply makes my vehicle move.	I have explained how the energy supply makes my vehicle move, but my explanation could be clearer.	My explanation for how the energy supply makes my vehicle move is unclear and needs lots of improvement.
Application				
I will build an energy-supplied vehicle that converts an energy supply effectively into motion.	I have built a very stable vehicle that moves very well using its energy supply.	I have built a stable vehicle that moves well using its energy supply.	I have built a vehicle that is a bit wobbly and unstable, but it moves using its energy supply.	I have built a vehicle that is very wobbly and unstable, and it moves some (or not at all) using its energy supply.

2 Build your energy-supplied vehicle. There are several options from which to choose for building, depending on your design and what materials you have available. Choose **one** of the following:

- Build your energy-supplied vehicle with a toy construction kit such as K'nex or similar type of kit.
- Build your energy-supplied vehicle using the materials you have around your home.
- Build your energy-supplied vehicle using a purchased model kit. These model kits are available in hobby and toy stores or from Internet stores.



An example of a self-powered vehicle. This toy trike has a balloon attached to the back as a source of energy.

3 Test your energy-supplied vehicle. If it does not work the way you want, make changes and repeat the testing. Repeat as many times as you wish until the vehicle performs the way you want. Every time you do a test, record your result in the ***Vehicle Test Recording Chart***.

When your vehicle works the way you want it, go to Step 5.

Vehicle Test Recording Chart			
Test	**Success? (Yes or No)**	**If no success, what went wrong?**	**What did you change to fix the problem?**
1			
2			
3			
4			

5			
6			
7			
8			

9			
10			

4 If you have a digital camera, take a photo or video of your energy-supplied vehicle for sharing later.

5 No matter what method you used to build, the last step is to write an explanation of how your energy-supplied vehicle works. Be sure to explain the idea behind your design as well as how the energy source you chose works to produce motion.

Use the space below to draft your explanation: