

## 6.8P Project - Make an Energy storage Car

### Aim

To make a car that carries its own energy and see how far it can go.

### Assessment

Based on the distance your car travels.

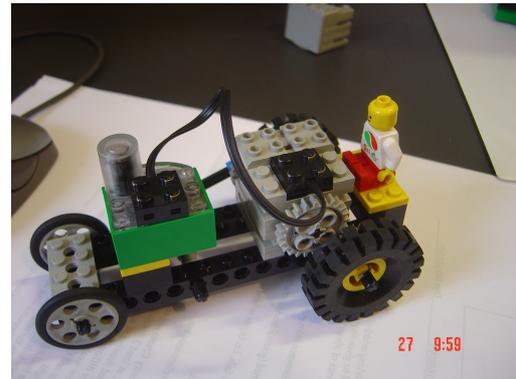
### Possible Equipment

Renewable energy kits with simulated storage (See Resources lists) or

Large capacitor (1-10 farads) and 10 ohm resistor (see charging a capacitor circuit next page) or

Energy kits with energy storage device (e.g. LEGO capacitor or rechargeable battery).

Renewable energy source (solar, wind or fuel cell)



### Discussion

Renewable energy sources are fine while their available and abundant but what about solar at night and wind generator on a still day? Sometimes the generator is just too heavy to carry. So most energy efficient cars have a storage device; a capacitor or rechargeable battery to carry that energy which can be recharged when the source is available again. The car however must be efficient in its energy usage i.e. all its energy is converted mostly to motion not heat or sound.

Possible energy storage devices include large capacitors, rechargeable batteries, even a wound up coiled spring or elastic band

### Method

1. Decide what source of renewable energy you will use (solar, wind, water, human, fuel cell)
2. Find a device to store the energy
3. Decide the design of your car and how the car will travel maximum distance on the limited power available
4. Explain to your teacher your ideas (you can draw, speak or show)
5. Once you have teacher's approval, construct your car!
6. Charge your capacitor or meter. Run the car on a long straight stretch. How far did it go?
7. Redesign if it was not efficient!

### Results

How far did your car go?

What did you change to make it work better?

This temporary battery doesn't last very long. What could you do to make your car go faster and further?

**Charging a capacitor:**

1. Connect the circuit as shown.  
Energy source can be solar cell, generator or battery.
2. Connect the multimeter (DC voltage setting) across the resistor
3. Charge up the capacitor until the resistance voltage drops to zero.
4. Disconnect the capacitor (being careful not to short the terminals) and connect to your motor

Energy source e.g. solar cell

