

BI-CARB AND VINEGAR POWERED CAR

Lab Tech Notes



Overview

Subject:	Science and Technology
Grade:	Years 7 – 9
Topics:	Conversion of energy (chemical) Relationship between speed and distance Interaction between energy and materials

Materials

Item/s Per Student	Where to Buy?
650ml Litre Powerade bottle	Supermarkets
Different nozzles (must fit Powerade)	Supermarkets (on other drink bottle types)
Drinking straws	Supermarkets
Bamboo skewers	Supermarkets
Toy truck wheels (multiple size variations)	Craft Stores
Extra paper and/or cardboard for shape variations	Officeworks
Bicarb Soda	Supermarkets
Vinegar	Supermarkets

The items listed above are the minimum amount per student for the activity to work. Please ensure there are extra materials available for students in case of breakage, restarts etc.

Tools

Item/s	Where to Buy?
Ruler or measuring tape	Officeworks
Scissors	Officeworks
Hot glue gun	Officeworks
Extra hot glue gun glue	Bunnings
Safety glasses	Bunnings
Rubber/latex gloves	Bunnings

Risk Management/Hazards

The main hazard is the hot glue gun, the front part of the gun can get quite hot and the glue itself can cause minor burns. Students are instructed to keep hands away from all hot surfaces/materials.

While cutting the bamboo skewers and paddle pop sticks, sections may fly off unexpectedly. Students must wear safety glasses to prevent any pieces from hitting them in the eyes.

During the experimental stage when the bicarb soda combines with the vinegar, pressure builds up rapidly in the bottle. Student must wear the appropriate safety gear and be cautious of minor, non-flammable explosions.

Difficulties

Ensuring that the combining of bi-carb soda, to the bottle containing the vinegar is a relatively seamless process, is challenging. This however is essential, to maximise the amount of gas and pressure that is built up in the bottle, to optimise output and propulsion. A large gap between the wheels and the straw will make the wheels wobble, causing the car to veer left or right and overall reducing the distance travelled. Ensuring that the straw and skewer are very close in length will provide stability and allow the car to stay in a straight line.

Experimenters should take caution when the bi-carb soda and vinegar have mixed, and the bottle has been shaken. The car should be placed on the ground in position and the nozzle should be opened in a timely manner, so the pressure does not cause an explosion rather than propulsion.

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