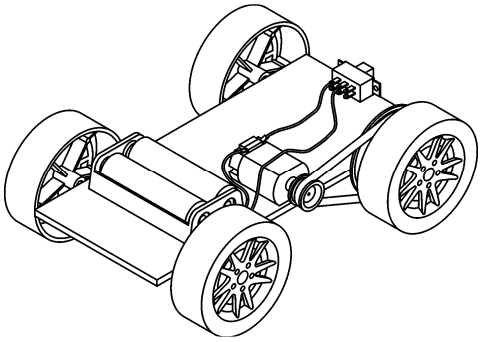
BELT DRIVEN CAR

DESCRIPTION

This is a four wheeled vehicle at its simplest. Motive power is provided to the rear axle by an electric motor-driven belt (a rubber "o" ring).



A number of these cars can be raced, and have the potential to be added to, to drive faster! Also, car bodies can be built, and decorated in the Art class!

THE PROJECT

The major aspects of this project are the planning, design, construction and assembly stages of the vehicle. To this can be added usage and performance (including the races).

1. COMPONENTS REQUIRED

1.1 COMPONENTS SUPPLIED

The following components are supplied in a plastic bag for the construction of one *BELT DRIVEN CAR*

1 x	3V electric motor (flat)	1 x	Sliding switch – on/off (small)
2 x	2.5 steel shaft – 120mm long	1 x	O-ring (belt)
2 x	PVC Guide tube (white) 100mm long	1 x	5.5mm diameter pulley
4 x	Wheels 52mm diameter	1 x	30mm diameter pulley
1 x	2xAA battery holder		

Note: it is suggested that, before you commence construction, you check the components in your kit.

1.2 ADDITIONAL REQUIREMENTS

1.2.1 Available from us are AA batteries, which need to be ordered separately.

1.2.2 The additional requirements are: material for the platform and fine electric wire.

2. DESIGN

- The drawings in this unit show the basic construction of the vehicle.
- The student has to make a full size drawing to determine the size of the vehicle's platform, the size and position of wheels, motor and battery holder. The body can be made from a single long piece of wood or plastic. Weight distribution and ease of operation should be taken into account.
- The PVC guide tubes are used as bearings for the axles, and are attached (glued) to the platform. The tubes should be 2-3 mm longer than the width of the platform. This prevents the wheels rubbing against the base, and slowing the vehicle down.

NOTE: When defining the width of the vehicle, the axle shaft provides an upper limiting factor.

- At the lower end, while the platform can be made from any piece of material, even a very narrow one, stability needs to be considered. Note: Cut-outs can be made for the wheels to allow wider material to be used (for an example, refer to the *DRAGSTER* unit on our website)
- With this vehicle only fixed steering is possible. However, you may wish to make it, so that the steering turns the car in one direction all the time, by mounting the front axle at a slight angle.

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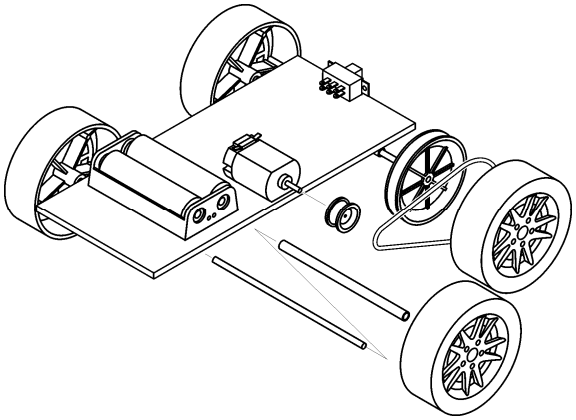
NOTE: while this vehicle at its most basic, it also allows scope for the student to develop and make a more interesting vehicle. Students can fabricate a body to simulate a monster truck, hot rod or other vehicle, or add a steerin system, by using a *FRONT WHEEL AND STEERING LINKAGE* set..

3. FABRICATION & PREPARATION FOR ASSEMBLY

- Cut the platform material to the required size and shape.
- Cut the axles to length. To determine the length of the axle, place a nail or piece of wire into the wheel hole to measure its depth. The length of the steel rod needed is worked out by taking the length of the plastic tube plus 2 times the depth of the wheel hole (for both wheels) plus 2 mm for clearance (so the wheel will not jam up against the platform).
  NOTE: When working out the rear axle length, remember to allow for the pulley as well.
- De-burr the steel shaft ends with a file.

4. ASSEMBLING THE CAR



- Assemble the pulley to the motor.
  Hint: Place the gear on the bench, insert the motor shaft into the pulley's hole and gently tap the end of the shaft (where it exits the motor) with a small hammer.
  WARNING: Don't just push the motor down as this can push the motor armature out of its bearings and jam the motor.
- Attach the motor, switch and battery holder on to the chassis using hot glue or double sided foam tape (roughen the surfaces to be glued with sandpaper to improve adhesion).
- Glue the plastic tube in place on the platform. Make sure that the tube is straight and not on an angle (or the vehicle will steer to one side).

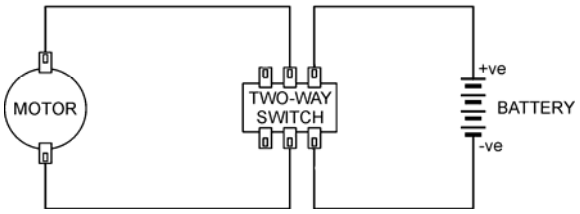
WARNING: hot glue can heat up the plastic tube and cause it to bend, making the axle a tight fit. To prevent this, and keep the plastic tube straight, place the axle through the plastic tube before gluing and hold the axle down until the glue sets. NOTE: Ensure that the axles guide tubes are at right angles to the car body and both guide tubes are parallel to each other.

- With the axle shafts in place, carefully press the 30mm pulley and wheels on to the shafts.

5. WIRING

The Switch should be wired as shown in the "Wiring Schematic

- Solder both the battery holder's wires to both of the terminals at one end of the switch. Solder two wires to the switch's middle terminals.
- Connect the other ends of those two wires to the motor's terminals. If the vehicle moves forward, solder the wires to the terminals. it goes in reverse, swap the wires & then solder them.



WIRING SCHEMATIC

CONGRATULATIONS! YOU HAVE BUILT YOUR CAR!