



## *BELT DRIVEN CAR – NO SOLDER\** (Code: BELTCAR-NS)

### DESCRIPTION

The *BELT DRIVEN CAR* 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 enhanced to drive faster! Also, car bodies can be built and decorated to allow students to individualise their creations.



**LEVEL:**

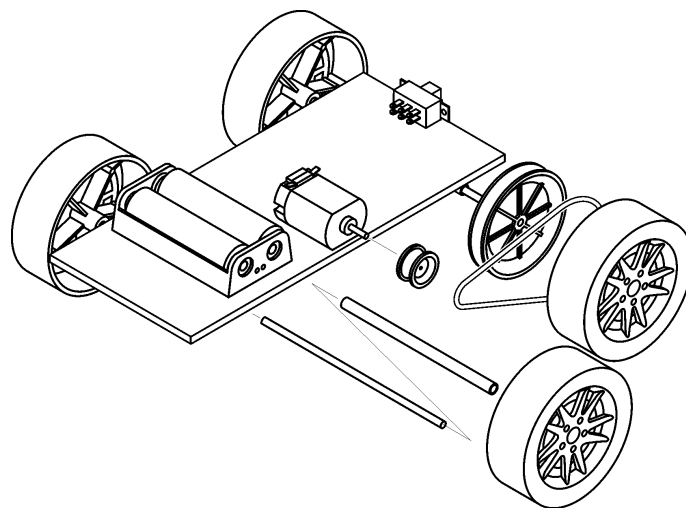
Introductory

**HOURS TO CONSTRUCT:**

6 - 8 hours

**SKILL DEVELOPMENT:**

- Planning and Design
- Manufacturing
- Mechanical
- Electrical

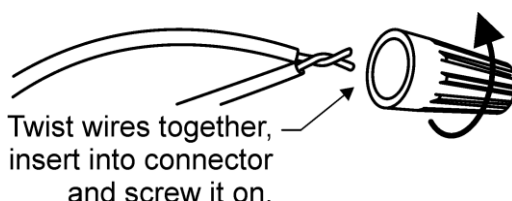
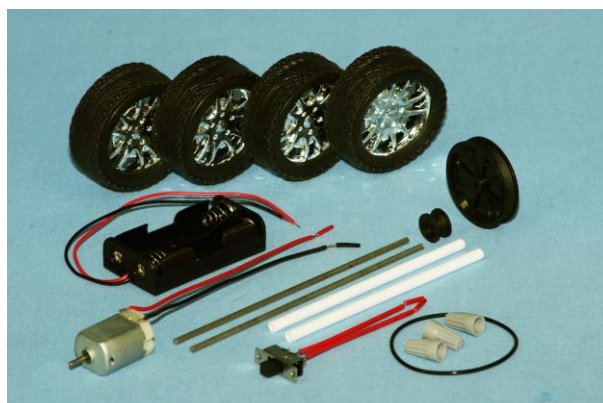


\* a solder version is available – code: *BELTCAR*



## WHAT'S IN THE KIT?

- All the mechanical and electrical components required to make the *BELT DRIVEN CAR* work including the wheels, pulleys, drive belt, motor, battery holder and switch.
- A detailed teaching unit with a complete parts list, design suggestions, step by step instructions for wiring up the components, and general construction guidelines.



## WHAT ELSE IS NEEDED?

The following items are required and are available from Scorpio Technology, but need to be ordered separately:

- 2 x Battery – AA (BATTA – 4 pack or BATTALK40 – 40 pack)
- Single-sided adhesive tape (TAPESS)
- Double-sided adhesive tape (TAPEDS)
- We recommend the following spares when buying class sets of kits to replace parts damaged or lost by students:
  - Steel rod and Plastic guide tube (SRGTW – 5 of each in a pack)
  - Wheels (W52C2 – 40 in a pack)
  - Large pulley (PU30 – 10 in a pack)
  - Small pulley (PU5.5 – 10 in a pack)

The following material is to be supplied by the student / teacher:

- Material for the platform (PVC or acrylic sheet, plywood, etc.)

## TOOLS REQUIRED

The following tools are required:

REQUIRED TOOLS	ORDERING CODE
Assorted hand tools – depending on the choice of materials to be used	-
Hammer	-
Ruler and pen	-
Craft knife	CRKNF
Mini Bolt Cutters	BOLTCUTM



## ABOUT THE PROJECT

The major features of this project are the planning, design, construction and assembly stages of a simple vehicle.

## DESIGN PHASE

- Create your own unique *BELT DRIVEN CAR* design based on our drawings which focus on component relationships, rather than dimensions. This provides scope for students to individualise their *BELT DRIVEN CAR* design and increase their engagement in the project.

During the **Design phase**, students will need to:

- Evaluate the suitability of various materials for the platform, such as PVC, acrylic, plywood or balsa wood
- Determine the size of the vehicle's platform, the position of the wheels, and the location of the motor, switch and battery holder
- Evaluate the stability of the vehicle. For example, consider the length of the axle and the distance between the front and rear wheels
- Consider the effects of having the front wheels driven rather than the rear
- Consider researching what they can change or add to make the car go faster
- Take into account weight distribution and ease of operation
- Evaluate available technologies that can be used, for example:
  - 3D printer (if you are making a shell for the vehicle)
  - laser cutter (which allows more interesting shapes than usual)
  - vacuum former (if you are making a shell for the vehicle)
- Consider the practical aspects of construction and assembly. For example, clearance for the wheels

## MAKING / CONSTRUCTION

Once the Design process has been completed, the students will be able to start **building their design**. They will:

- Make the *BELT DRIVEN CAR* platform they have designed
- Mount the motor, battery holder, switch and guide tubes on to the platform
- Wire up the battery holder, motor and switch
- Mount pulleys and wheels onto the axles
- Test and adjust the *BELT DRIVEN CAR*
- Troubleshoot any problems!

## DOES THE TEACHING UNIT INCLUDE ANY THEORY?

The Teaching unit has a THEORY section that covers:

- How pulley and belt systems work
  - Input and output torque
  - What happens if a car stalls
  - Speed vs acceleration
  - Disadvantages & advantages of pulleys and belts

For more information and ideas, go to our website:

<https://www.scorpiotechnology.com.au/kits-in-action>

