Edgewood Primary School - Year 5 and 6

Design and Technology – Knowledge Organiser

Mechanisms Unit:

Toy Car (pulleys/gears with 3D printing)

Prior Learning

Experience of axles, axle holders and wheels that are fixed or free moving.

Basic understanding of electrical circuits, simple switches and components.

Experience of cutting and joining techniques with a range of materials including card, plastic and wood.

An understanding of how to strengthen and stiffen structures.

Key Knowledge for this Unit

Design

Below are some of the main considerations of a design process for a toy vehicle.

Chassis, Axle, Wheels:

You will need to draw on your prior knowledge of chassis, axle and wheel systems. The chassis should include axle holders. Your axle needs to be strong enough to hold the wheels, and fit freely in the axle holder. Consider the materials of your wheels.

Gears and Pulleys

The vehicle can run using either a gear or pulley mechanical system. In either case, you need to understand the ratio (how often larger wheels turn in relation to smaller pulleys). With gears, this can be done by counting the number of teeth.

As a part of the design process, you should be able to sketch and annotate different ideas.

Make

You should plan the main stages of making, using either a checklist, a storyboard, or a flowchart.

In order for the vehicle to move, it is essential that the mechanical system is planned effectively, and includes an input, a process, and an output. –

e.g. Batteries hold stored power, accessed by using a switch (**input**) to enable a motor to set in motion the motor spindle.

Motor spindles can attach the motor to the gears/pulley system (**process**), which in turn propels the axles and/or wheels to move the vehicle forwards/ backwards (**output**).

Health and Safety

Follow guidelines for working with electrical equipment.

Walk safely and calmly around the classroom, ensuring that your workspace is kept tidy.

Evaluate

How well does your mechanical system work?

Does it move smoothly?

Does it meet its purpose?

What would your audience think about your product?

What would they like about it? What would they not like?

What problems did you face in constructing your mechanical system?

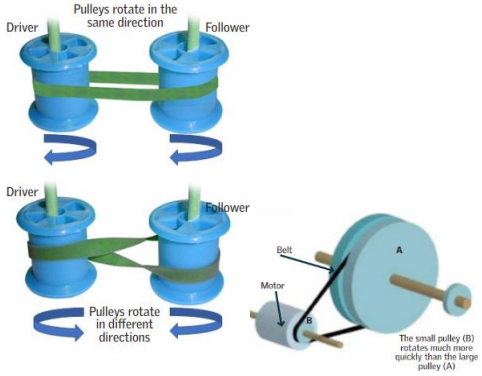
What changes did you need to make?

What could you still improve about your product?

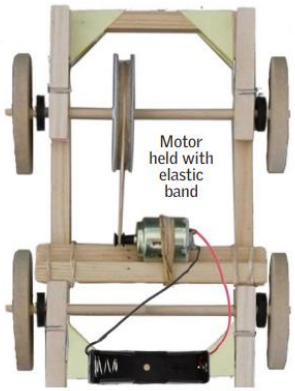
How would you do things differently next time?

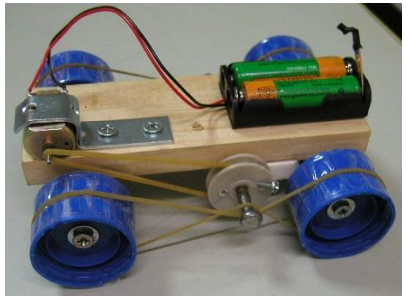
Key Vocabulary

pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, circuit, switch, circuit diagram



Examples





Pop Quiz Questions

- Can you name different types of mechanisms?
- How does a slider/lever/linkage mechanism work?
- How does an electrical circuit work?
- Can you identify the parts of a simple circuit?