# Alder Coppice Primary School — Knowledge Organiser

| DESIGN &TECHNOLOGY | Year: 2 | Unit 2: MECHANICS | Links to: SCIENCE |
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## What I Should Already Know:

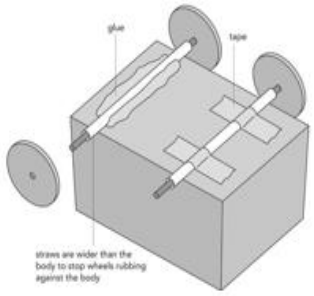
Some things can move in different ways
Naming some direction of movement and how things move
To know that a mechanism provides movement
To know what a wheel mechanism is
To know what a lever is and how it works
To know what a slider mechanism is and how it works.

## Skills & Enquiry:

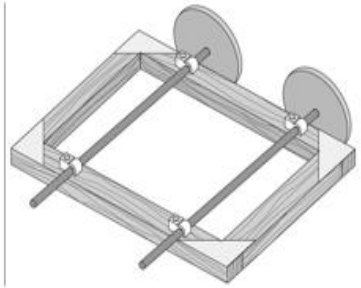
Communication - ideas, observations, comparisons, preferences
Physical –
Skills to manipulate materials and use tools
Thinking -
To generate ideas for design
To select materials for a purpose
To select appropriate tools/ techniques to shape and join
Investigate –
To investigate simple mechanisms

## Diagrams:

Free axle—The picture shows you two ways to fix the bearings onto the body.




Fixed axle—The next picture shows you the other way to let the wheels turn. This time the axle remains fixed and the wheels turn on the axle. The axle is fastened to a wooden body with cable clips.



## Unit Specific Vocabulary:

**Mechanism** – something that can be used in a product to make movement.
**Motion** – the movement
**Axle** – a rod that enables a wheel to turn
**Fixed axle** – the axle is fixed to the chassis and the wheels are free to turn
**Free axle** – the wheels are fixed to the axle and the axle turns in a bigger tube called a bearing
**Bearing** - part of a machine that allows one part to rotate or move
**Cab** – where the driver would sit
**Chassis** – the base on which the vehicle is built
**Dowel** – the wooden rod for making axles
**Load** – what is being lifted or moved

## What I should know by the end of the Unit:

To know that a mechanism provides movement
To know what a wheel mechanism is
To know what an axle is and how it works
To know what a chassis is
To name a famous car developer

## Famous Designer:

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Designer - **Henry Ford** – made cars accessible to many people

## Key Mechanical Facts

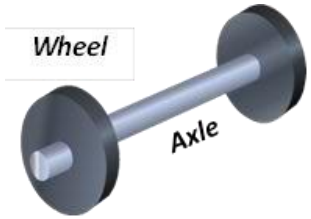
Wheels and Axles
Mechanisms are the parts that make something work.

Mechanisms are all around us! Most objects that help us in our lives are made up of different mechanisms.

Wheels and Axles are mechanisms that help things to move.

Wheels are circular objects that roll on the ground, helping vehicles and other objects to easily move.

Axles are rods that help wheels to rotate. The wheel can either rotate freely on the axle, or be attached to (and turn with) the axle. Axles often bear the weight of the vehicle and its cargo.




## Example Mechanisms

-A Ferris wheel is one example of a wheel and axle mechanism in action. Normally, Ferris Wheels are fixed to the axle. Force is applied to the axle which makes it spin. This makes the giant wheel spin too!

-Roller skates are another example of wheel and axle mechanisms. Obviously, there are four wheels here instead of one, and the wheels are much smaller. Often, the wheels rotate free from the axle, but sometimes they are fixed.

Toy cars (and real cars) use wheel and axle mechanisms to move. On toy cars, the wheel is normally fixed to the axle, meaning both the wheel and axle spin. This makes it really important that there is not too much friction on the axle, or the wheel will not move!

## Designing a vehicle

-You need to think about who your product is for – what is its purpose and who is going to use it?

### Chassis
-The chassis is the frame or base on which the vehicle is built. A chassis should be strong and rigid enough to hold the vehicle.
-The chassis should include axle holders. These are designed so that the axles do not have too much friction against them.

### Axle
-Consider what you will make your axle from. It needs to be strong enough to hold the wheels, and fit freely in the axle holder.

### Wheel
-Consider whether your wheels will be fixed to the axle, or free.
-If fixed, they need to be firmly attached. If not, they need a stopper to prevent them from falling off.
-Some materials allow the wheel to move more freely on surfaces.