Year 5 – DT Knowledge Organiser

Electrical / Mechanical Components

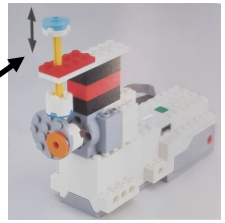
Lego Boost

What I remember from Year 3...

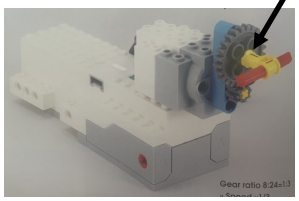
- Pulleys can be used to affect the speed, direction or force of a movement.
- Levers are used to move a heavy load with one end when pressure is applied to the other.

Design...

Cam mechanism



Gears

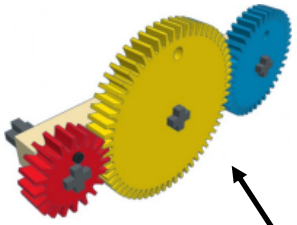


Ole Kirk Christiansen

Ole was a Danish Carpenter. In 1932, he founded the construction toy company – The Lego Group. Ole named the company Lego. Lego means 'play well'.

Key Knowledge...

Gears are wheels with teeth that slot together. When one turns, the other turns too.



Scan to watch gears move!

Gears can be found in toys.

Can openers have a gear mechanism.

Bikes have gears attached to the chain.

Gears work in three ways...

To increase the turning force – Small gears turn quickly but with a smaller force, whereas large gears turn slowly with a greater force.

To increase the speed –If you connect a larger gear to a smaller gear, the smaller gear turns much more quickly to keep up. Above, the blue gear will be turning faster than the yellow gear, and the red gear will be turning faster than the blue one.

To change direction – When you join two gears together, the second one will always turn in the opposite direction. So if the red gear above is turning clockwise, the yellow gear will turn anticlockwise, and the blue gear clockwise again.

Key Vocabulary...

Cam – A linkage system that has a follower to convert **rotary** movement to **linear** movement.

Rotary – A turning motion.

Linear – A straight line motion.

Shaft – Has one or more cams attached to it.

Follower – Causes the slider to move the object from rotational to linear motion.

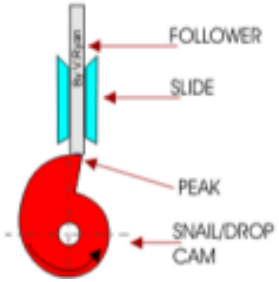
Slide – Converts rotational movement into linear movement.

Eccentric – A circular shaped cam.

Snail – A cam that produces a slow rise and quick drop movement.

Key Knowledge...

There are 4 main components that used to construct a working cam mechanism – cam, **shaft**, **follower**, and **slide**.



Cams are found in many machines and toys. They come in various shapes called cam profiles. They can be round, pear / egg, **eccentric**, hexagon, oval and **snail**.

Scan to watch and find out more about cams!

The shape of the cam controls the movement of the follower. If the pivot point is not central, the movement will be greater. The peak is the part of the cam that is the furthest from the pivot point, creating a larger movement. The snail causes a sudden drop as the follower falls from the peak to a part of the cam that is close to the pivot point.

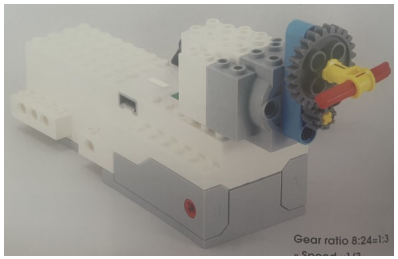
Machines and products can be controlled through a computer device.

Key Skills...

Cam mechanisms (Page 84).

Use the idea book to construct and code a Lego model with a cam mechanism.

Use the idea book to construct and code a Lego model that changes speed with gears.



Changing speed with gears (Page 50).

Use the Lego Boost App to control your Lego models. The App uses Bluetooth to connect your device to your model.

You can code your model to move.

Build, code and play!