



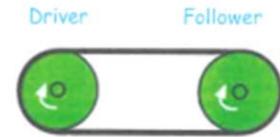
What should I already know?

- Gather information about needs and wants, and develop criteria to inform the design of products that are fit to purpose, aimed at individuals or groups
- Generate, model, and communicate realistic ideas through discussion and where appropriate, annotated sketches, cross-sectional and exploded diagrams.
- Order the main stages of making
- Confidently select appropriate materials including electrical components
- Measure, mark out, cut, and shape a range of materials using appropriate tools, equipment, and techniques
- Evaluate both during and at the end of the project
- Evaluate their products carrying out appropriate tests.

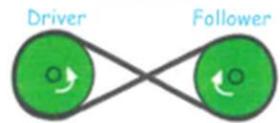
Skills I will develop:

- Select appropriate tools and techniques
- Measure and mark out accurately
- Use tools and equipment safely e.g., junior hacksaws, glass paper,
- Cut and join accurately to ensure a good quality finish to the product
- Use research to develop a design specification for a functional product. Take account of constraints including time, resources, and cost
- Generate and develop innovative ideas and share and clarify these through discussion
- Communicate ideas through annotated sketches, pictorial representations, or circuit diagrams.
- Evaluate against the original design specification
- Evaluate the product personally and seek evaluation from others.

Developing understanding of gears and pulleys



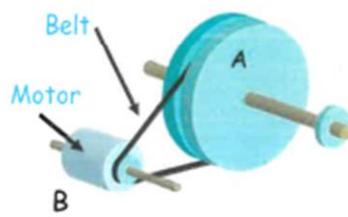
The pulleys rotate in the same direction



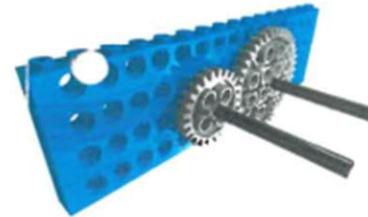
The pulleys rotate in different directions

Using construction kits, ask children to explore gear ratio using combinations of two gears e.g.

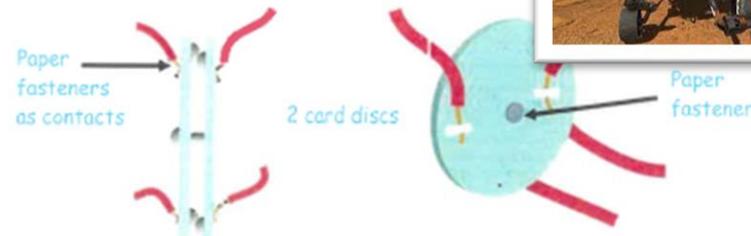
No. teeth	Ratio
8, 16	2:1
8, 40	5:1
8, 24	3:1
40, 40	1:1



The small pulley (B) rotates much more quickly than the large pulley (A)



An example of a homemade reversing switch



Key Vocabulary (including definition)

Modelling	To realise and manipulate ideas in a tangible form
Purpose	The reason you are designing something
Design brief	The brief outlines how a problem will be resolved.
Pulley	A grooved wheel over which a drive belt can run.
Gear	A wheel with teeth around its circumference.
Drive belt	The belt which connects and transfers movement between two pulleys.
Gearing up or down	Changing the rotational speed of a product by the use of pulleys or gears. When a small pulley or gear is used to drive a larger one the rotational speed is reduced and the product has been geared down.
Mechanical system	A set of related parts or components used to create movement.
Driver	The gear or pulley that provides the input movement to the system.
Follower	The gear or pulley that provides the output movement to the system.
Mesh	The point where two gears join together and transfer movement.
Motor spindle	The rod on the end of the motor onto which a gear or pulley is attached.