Design and Technology Year 6 Mechanisms-Pulleys and Gears

Prior Learning

Yr1-basic exploration of levers and sliders
Yr2-Wheels and axles (free and fixed)
Yr4-Levers and linkages
Yr 4&5-Electrical systems

By Year 6 the children have a good understanding of basic mechanisms and how and when these are used. They have experience of disassembling products that use them.
In addition, the children are able to use tools to create simple shell and frame structures and understand how triangulation can aid support.
The children are able to carry out research into current products on the market, can gather target audience thoughts and preferences, create exploding drawings and in year 5 began to learn how to draw cross sectional diagrams.

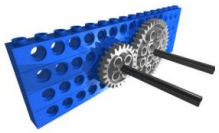
Pulleys and Gears s in the world today





Gears-Gears are toothed wheels that lock together and turn one another.

The wheels are usually different sizes so that one gear speeds up to slow down the next gear.
Gears are also used to change the direction of movement.



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

Key Vocabulary

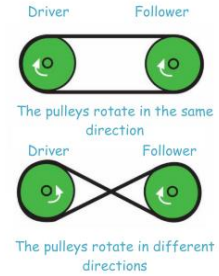
Drive belt – the belt which connects and transfers movement between two pulleys.
Gearing up or down – changing the rotational speed of a product by the use of pulleys or gears. When a small pulley or gear is used to drive a larger one the rotational speed is reduced and the product has been geared down.
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.

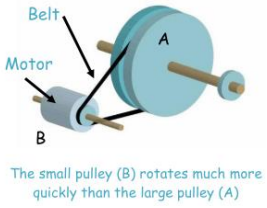
Intended Outcomes

1. **To identify pulleys and gears in the world.**
2. **To explain how gears and pulleys work and demonstrate how they are used.**
3. **To create working pulleys and gears using kits and by making them.**
4. **To explore the effect of differing gear sizes and ratio.**
5. **To create a product (from a given brief) that includes working pulleys/gears.**
6. **To fully evaluate the effectiveness of the product by referring to the specification and stating how to improve them**

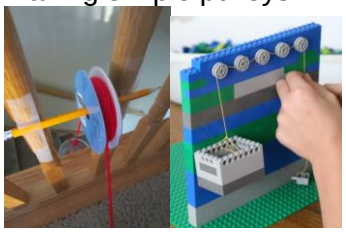
Pulley-Pulleys do not touch but the wheels are joined by a drive belt.

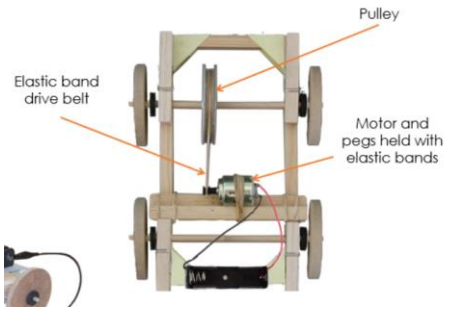
They can be used to change the speed, direction or force of a movement.





Making simple pulleys





Useful Website and Hints

https://www.youtube.com/watch?v=5amir8BpfHM

https://www.youtube.com/watch?v=r3Ru1zZjvug

https://www.youtube.com/watch?v=odpsm3ybPsA