

Spring Project Reflections

Design Technology – Levers and Pulleys

Concept and Milestones

Take inspiration from design throughout history

This concept involves appreciating the design process that has influenced the products we use in everyday life.

D/TID1 • Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.

D/TID2 • Improve upon existing designs, giving reasons for choices.

D/TID3 • Disassemble products to understand how they work

Mechanics

D/PSII • Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers and pulleys).

What is a pulley?

A pulley is a wheel on a fixed axle with a groove in it to guide a rope or cable. The rope or cable is attached to the object you want to lift and looped over the pulley so that the end of the rope is hanging down on the other side. The pulley changes the direction of the force needed to lift the object or the amount of force that is needed to lift an object.

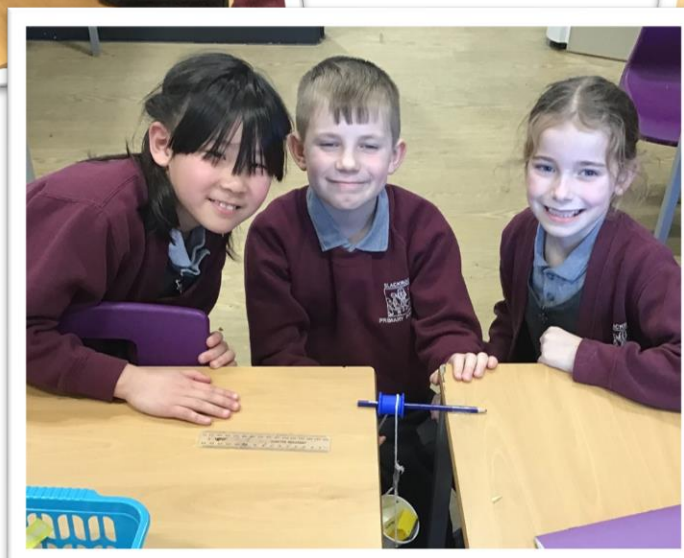
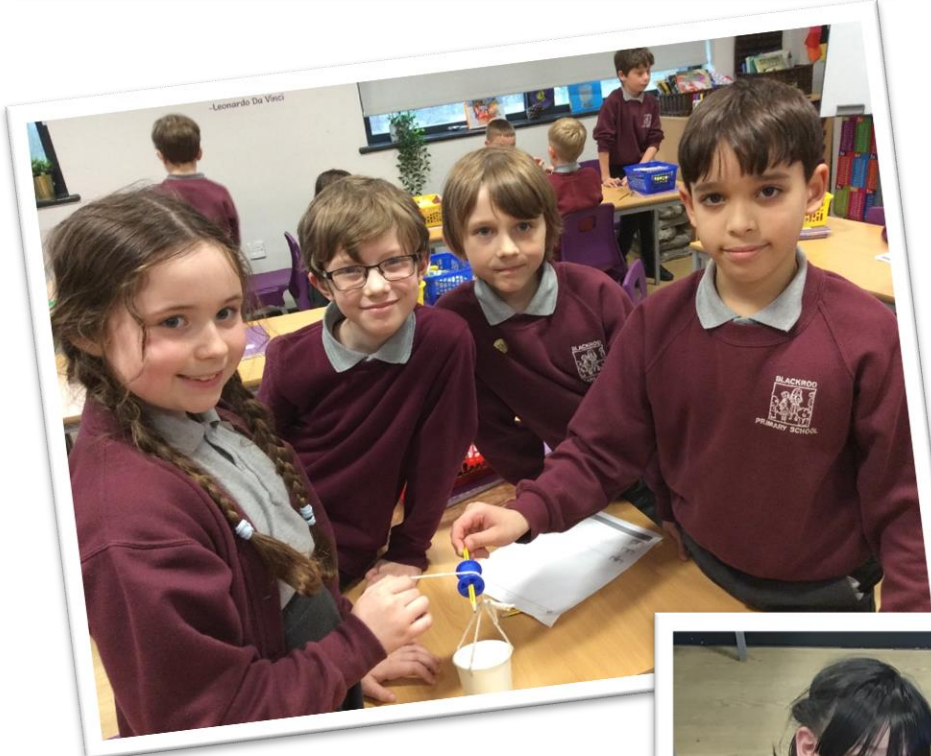
In everyday life they are used in lifts and elevators, in wells for pulling up buckets of water and in weight lifting machines in the gym. Next time you visit a building with a lift, see if you can spot the pulleys working.

Sir Isaac Newton is the scientist known for the discovery and explanation of forces.



Sir Isaac Newton was born in 1643 and went on to be one of our greatest scientists.

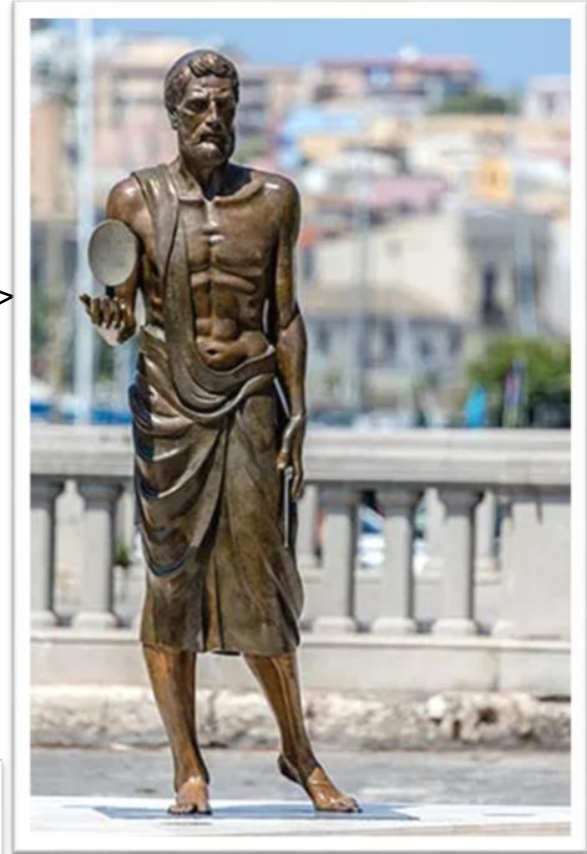
Legend has it, that Newton was hit on the head with an apple and that is how he discovered gravity. This isn't quite true... He did see an apple fall from a tree, but rather than hitting him on the head, it got him thinking and that's how he worked out that gravity must exist.



We followed instructions to make our own pulleys.

We learned that the first scientist to recognize and use the power of the lever was Archimedes (287-212/211 BC).

This gifted Greek mathematician and inventor once said,
"Give me a place to stand and rest my lever on, and I can move the Earth."



We explored different types of levers and linkages and disassembled some examples to help us understand how they work.



Key Vocabulary

Lever - a rigid bar which moves around a pivot. Levers are used in many everyday products.

Linkage - the card strips joining one or more levers to produce the type of movement required. The term 'linkage' is also used to describe the lever and linkage mechanism as a whole.

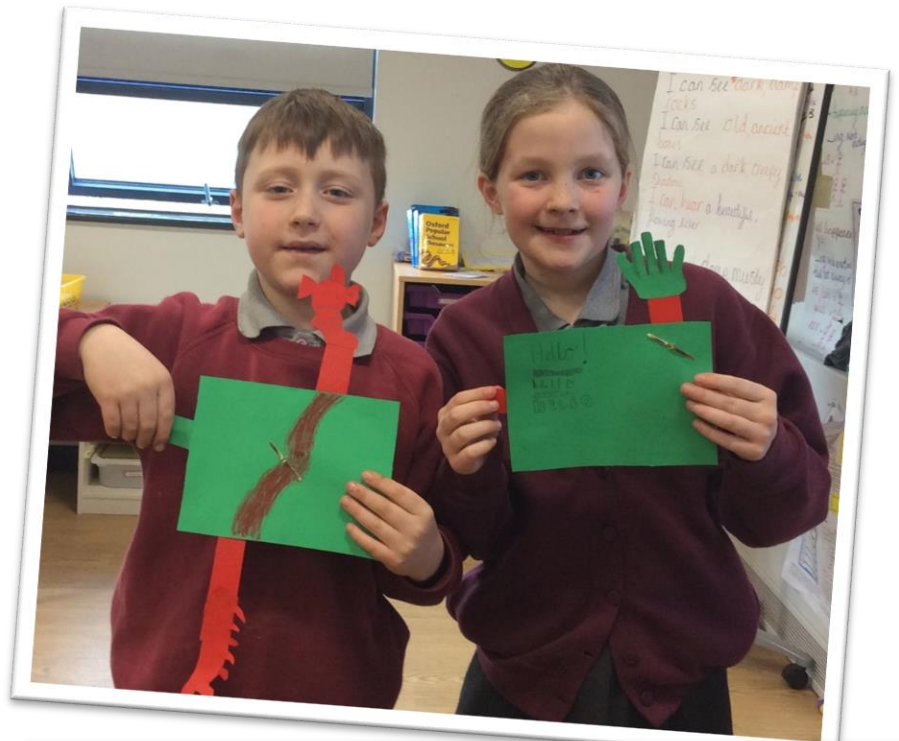
Guide or bridge - a short card strip used to keep lever and linkage mechanisms in place and control movement.

Pivot - the central point, pin, or shaft on which a mechanism turns.

Lever is the simplest type of mechanism. A mechanism means a system of parts working together.

A fulcrum is any pivotal point that supports the movement of a lever.





Our group challenge was to make our own lever creation by following a set of instructions. We did a great job!



Home Learning links

[\(141\) What is a Pulley? - Simple Machines | Science for Kids | Educational Videos by Mocomi - YouTube](#)

[\(141\) The mighty mathematics of the lever - Andy Peterson and Zack Patterson - YouTube](#)

[What is gravity? - BBC Bitesize](#)

We then put our new knowledge to the test and designed and constructed a moving picture containing both a lever and a pulley.

