On the move: simple mechanisms

Think Physics,
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Outcomes

• Know key terms related to levers, pulleys and gears
• Identify opportunities for different types of scientific enquiry with levers, pulleys and gears
• Considered how to link science and DT
Year 5

• recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Draft performance indicators:

• describe how simple mechanisms (at least: pulleys, levers, gears) increase the effects of a force.
Technical knowledge

• understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
Types of scientific enquiry

- Observing over time
- Pattern seeking
- Identifying, classifying and grouping
- Comparative (and fair) testing
- Researching using secondary sources
Household object sorting activity
What is a simple machine?

A mechanical device which is used to change:

• the size of a force
• the direction of a force
Simple machines: making life easier

Six basic machines

- Inclined plane (slope)
- Wedge
- Lever
- Pulley
- Wheel and axle
- Screw

• Gears
How can a child lift an adult off the floor?
Levers – Key terms

Load: The weight (force) that is being moved
Effort: The force being used to move the load
Fulcrum: The point about which the lever pivots
Aside: Classes of lever

Class 1: Fulcrum between Load and Effort

Class 2: Load between Fulcrum and Effort

Class 3: Effort between Fulcrum and Load
Levers Activity

Pattern seeking

Comparative testing
Links with numeracy

Load x distance of load to fulcrum = effort x distance of effort to fulcrum
Links with DT

- Launching a ping-pong ball (see-saw)
- Saving the Gingerbread man (coathanger)
- Building a trebuchet / catapult (lollysticks)
Pulleys

Fixed pulley

Moveable pulley

Effort

Load
Block and tackle

Effort

Load
Demo Pulley
Pulley activity

• The Power of Pulleys

Taken from Activity 4a
Squashed tomato challenge

To design, build and test a way of moving tomatoes that won't squash them!

Http://practicalaction.org/squashed-tomato-challenge-5
• Kaleidogears

• Build your own clock
Gears – Key terms

• Rotating wheel with teeth (or cogs) cut into the edge.
• The fit into the teeth of a second wheel.

• Can change speed and direction of applied forces
Bringing it all together

- Heath Robinson / Rube Goldberg machines
Useful links

- http://www.robives.com/blogshop
thinkphysics.org

Contact us on
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