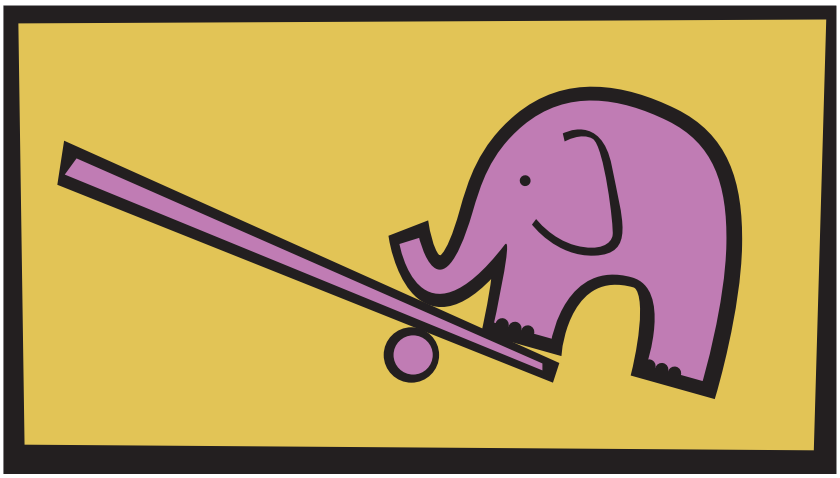
tiny tinkering tasks

Task theme

Levers



Task title

How are very heavy loads lifted?

Learning outcomes

- To understand how simple machines such as levers make work easier.
- To identify how the lever is used in many familiar household products.
- To discover a relationship between the length of lever and the amount of lift.

EHoM link

PROBLEM FINDING
Ask questions based on observations.

SYSTEMS THINKING
Illustrate (e.g. through labelling) how an object or tool breaks down into parts.

EDP link

ASK

IMAGINE & PLAN

Key Stage/Year Group Suitable for both KS1 and LKS2

Resources required

- A selection of screwdrivers, pennies
- A selection of lever lid tins – these can be bought online – or old paint / syrup tins could be used.
- Pencils and books

How to run the task

1. Engage the children in exploring. Hand each group a lever lid tin, a screwdriver and a collection of coins. Before discussing the equipment, challenge them to open the lid with the coins and then the screwdriver. Which was the easiest to do? Can they explain why?
2. Elicit the children's understanding by asking them to explain how the coins and the screwdriver are working to open the lid. Introduce and explain the term 'lever', developing ideas from the children's explanations: lever. DEFINITION: a lever is a rigid bar which pivots around a fixed point called a fulcrum – the longer the lever, the easier it is to lift the lid (load).
3. Extend the challenge by asking the children to lift a pile of books using two pencils – one as a lever and one as the fulcrum. (NB: you could also use a wooden ruler with a triangular prism from the shape box as the fulcrum)
4. Encourage the children to evaluate their learning by asking them to draw a diagram labelling the different parts of the lever system (load, fulcrum and effort). You could introduce the notion of 'audience' to elaborate on this task – e.g. Draw a labelled diagram that would be useful to explain levers and fulcrums to small children, your grandparents etc. Can the children think about where the different groups of people will encounter levers in their daily lives?

Top Tips

- You may want to encourage children to fix their fulcrum to the desk with Blu Tack to make it more stable.
- Watch clip about Archimedes for more information about levers https://www.youtube.com/watch?v=YlYEi0PgG1g
- Challenge - experiment with lever length to see how much weight you can lift. Is there a mathematical pattern? http://www.discovere.org/our-activities/single-activity-detail/Leave%20it%20to%20Levers

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Evaluate learning

• Why might we want to use levers?
• Where can we find them?
• What advantage do they give us?
• Does the length of the lever affect the results?
• What happens when you move the fulcrum?

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As a practising teacher, Julie has written these 12 tasks to encourage more children to engage in engineering in primary schools. They have been stimulated by real-world engineering and inspirational ideas shared by others. They are linked to the Tinkering for Learning research and development project run by SEERIH.

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