we the curious
Workshop

Innoventions KS2 & KS3

Duration: 1 hour, max capacity: 30 students

Levers, pulleys, gears and cams are all examples of simple machines that can be used to make work easier. In this engaging and very hands-on workshop students will investigate different types of simple machine. Activities include lifting a teacher with one finger, launching a helicopter and using a pulley to change the direction of a force. The workshop culminates in a challenge task where teams construct and use a model catapult.

Key Words

Invention, Machines, Levers, Pulleys, Cams, Gears, Forces, Mechanics, Effort, Load, Pivot, Fulcrum, Design.

Learning objectives

Recognise how simple machines can be used to make work easier.
Appreciate that levers, pulleys, gears and cams can transform forces.
Understand that complex machines are comprised of simple machines working together.
Understand the basic scientific principles behind the functioning of each machine type.
Experience first-hand the advantages gained by using simple machines.
Investigate the structure and functioning of a catapult.

Content

Learn about different types of 'simple machines' and the scientific principles they employ.
Gain direct, hands-on experience of with levers, pulleys, gears and cams.
Have the opportunity to volunteer to take part in entertaining role-play activities that illustrate the functioning and benefits of different machines.
Work in small teams to investigate a range of activities, including using levers and pulleys to lift heavy loads and change the direction of a force as well as using gearing to launch a helicopter.
In teams, assemble, optimise and deploy a model catapult to launch an object towards a target.

Curriculum Links

KS2:

Science

Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect
Explore the effect of levers, pulleys and simple machines on movement
Design and make products that use levers, pulleys and gears and explore their effects

Design and Technology

Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)
Through a variety of creative and practical activities, acquire the knowledge, understanding and skills to engage in an iterative process of designing and making

KS3:

Science

Moment as the turning effect of a force
Forces as pushes or pulls, arising from the interaction between two objects
Forces measured in newtons

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Potential Hazards and accessibility

Flying objects and heavy weights, all used under supervision and with careful instruction.