

Mechanisms: Levers and Pulleys Mastery

Learning objective: To understand how levers and pulleys function as simple machines to transfer force and reduce the effort required for tasks.

Review these flashcards to master the terminology and mechanical principles behind levers and pulleys. Use these concepts to help Max the monkey solve his latest construction puzzles!

What is a fulcrum?

A fulcrum is the fixed point or pivot upon which a lever rests and rotates.

Define 'Effort' in the context of a lever.

The effort is the amount of force applied to the lever to move an object.

What is a 'Load' in mechanical terms?

The load is the object or weight that is being moved or lifted by the machine.

How does a fixed pulley change the way we lift an object?

A fixed pulley changes the direction of the force, allowing you to pull downwards to lift a load upwards.

Explain the difference between a Class 1 and a Class 2 lever.

In a Class 1 lever, the fulcrum is between the effort and the load (e.g., a seesaw). In a Class 2 lever, the load is between the fulcrum and the effort (e.g., a wheelbarrow).

What is 'Mechanical Advantage'?

Mechanical advantage is the benefit gained by using a machine to multiply the force applied, making it easier to move heavy objects.

If you increase the distance between the effort and the fulcrum, what happens to the force required?

The force required decreases, making it easier to lift the load, though the effort must move through a greater distance.

What is the primary function of a pulley system with multiple wheels?

A pulley system with multiple wheels (a block and tackle) divides the weight of the load, significantly reducing the effort needed to lift it.

Why might an engineer choose a pulley system over a simple lever?

An engineer might choose a pulley system when the load needs to be lifted to a greater height than a single lever's range of motion allows.

Explain why a long-handled pair of scissors makes cutting easier.

The long handles provide a greater distance from the pivot (fulcrum), which creates a mechanical advantage, allowing a small effort to create a large cutting force at the blades.