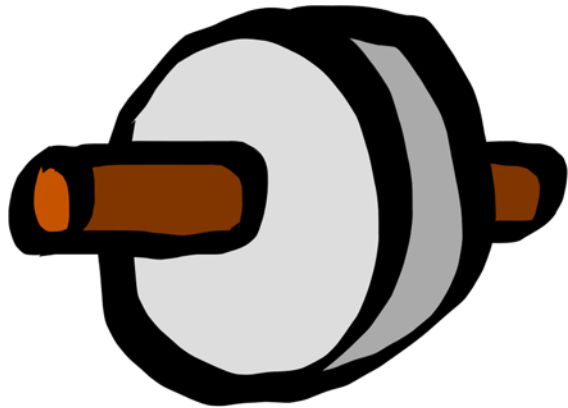


Name _____



Rolling Through Life: The Marvels of the Wheel and Axle

Mechanics of a Wheel and Axle

Have you ever wondered how wheels and axles work? They are a fascinating type of simple machine that has been essential to human civilization for centuries. In this passage, we will delve into the mechanics of a wheel and axle, understand how it operates, and explore various examples of its everyday applications.

How It Works

A wheel and axle is a simple machine consisting of two components: a circular wheel and a cylindrical axle that runs through the center of the wheel. These two parts work together to make tasks involving rotation and movement much easier. Let's break down how it works:

- **Wheel:** The wheel is the circular part that can rotate freely around the axle. It is often larger than the axle and provides a surface for other objects to move along.
- **Axle:** The axle is the cylindrical rod that passes through the center of the wheel. It serves as a central axis for the wheel to rotate around.

The magic of the wheel and axle lies in the mechanical advantage it offers. When you apply force to the outer rim of the wheel (known as the radius), the axle at the center also turns. The size of the wheel compared to the axle determines the mechanical advantage. A larger wheel relative to a smaller axle provides a greater mechanical advantage, making it easier to turn the axle.

This mechanical advantage is why wheels and axles are so commonly used in various machines and tools. They allow us to move heavy objects with less effort, increase speed, and achieve precision in tasks that involve rotation.

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Examples in Everyday Life

Wheels and axles are all around us, playing a crucial role in our daily lives. Here are several examples of how they are used:

- **Bicycles:** The wheels and axles on a bicycle allow you to cover long distances with ease. When you push the pedals, the force is applied to the wheel's outer rim, turning the axle and propelling you forward.
- **Cars:** Car wheels and axles are essential for mobility. The engine's power is transmitted to the wheels through the axle, allowing the vehicle to move.
- **Doorknobs:** Turning a doorknob is an everyday example of a wheel and axle. The knob acts as the wheel, and the spindle (the part connecting the knob to the door) is the axle. When you turn the knob, it rotates the spindle, allowing you to open or close the door.
- **Shopping Carts:** The wheels on a shopping cart make it easy to push heavy loads through the store. The axle connects the wheels, and as you push the cart, the wheels rotate around the axles.
- **Roller Skates:** Roller skates use wheels and axles to glide smoothly. The axles connect the wheels to the skates, allowing you to roll forward with each push.
- **Ferris Wheel:** A Ferris wheel is a giant wheel and axle. The wheel turns around a central axle, providing a fun and thrilling ride for those on board.

