



Curiosity Guide #402

Pulleys

Accompanies Curious Crew, Season 4, Episode 2 (#402)

Bicycle Cone Pulleys

Investigation #7

Description

How are bicycles and pulleys related?

Materials

- Bicycle that shifts gears
- Bicycle stand

Procedure

1. Begin by riding the bicycle at a low gear or place the bike in a bike stand and pedal the bike with your hands.
2. Switch to a higher gear while continuing to pedal. What do you notice?
3. Repeat the steps again while watching the back gears.
4. How are the gears like a pulley?

My Results

Explanation

Cone pulleys are one-piece pulleys made of wheels of different diameters. Gears on a bicycle are an example of cone pulleys. The gears all rotate together. The chain that runs around the gears serves the same purpose as a rope on a pulley. Rather than moving a load, the teeth on the chain are pulled along, causing the bicycle and the rider to move. By shifting the gears on the bicycle, the rider can apply more force to a smaller gear and get faster wheel rotation, or apply less force to a larger wheel and rotate the wheel more slowly.

Investigate further! Pulleys sure are useful machines, especially when they provide a mechanical advantage. Wouldn't Archimedes be surprised at all the different ways people have thought to use pulleys to magnify an applied force? We interact with pulleys every day, so be sure to keep your eye out and let us know what other examples you can find that use that uplifting simple machine—the pulley! Stay curious and keep experimenting!

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