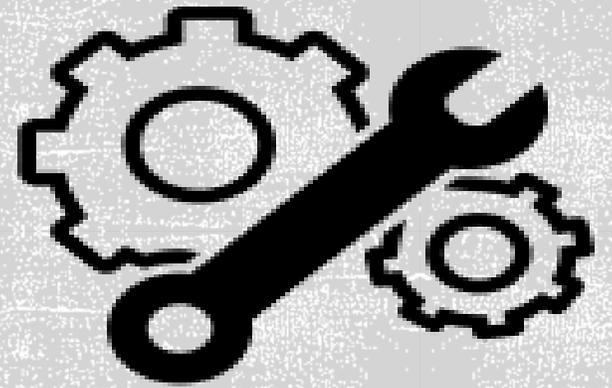


Inertia Wheel



Overview

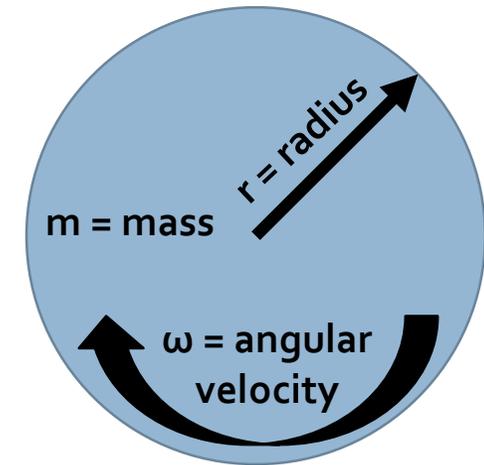
- Build the model
- Understand the science
- Make it relatable
- Use the demo
- Why does it matter?

Build the Model



Understand the Science

- Kinetic Energy (KE) - the energy of motion, which depends on speed and mass.
- The Inertia Wheel's KE is rotational and the energy is dependent on
 - Mass (m)
 - Radius (r)
 - Angular Velocity (ω) (i.e. RPM)
- KE will increase when
 - The mass of the wheel increases
 - The size of the wheel increases (in this case - constant)
 - The speed of the wheel increases



Make it Relatable

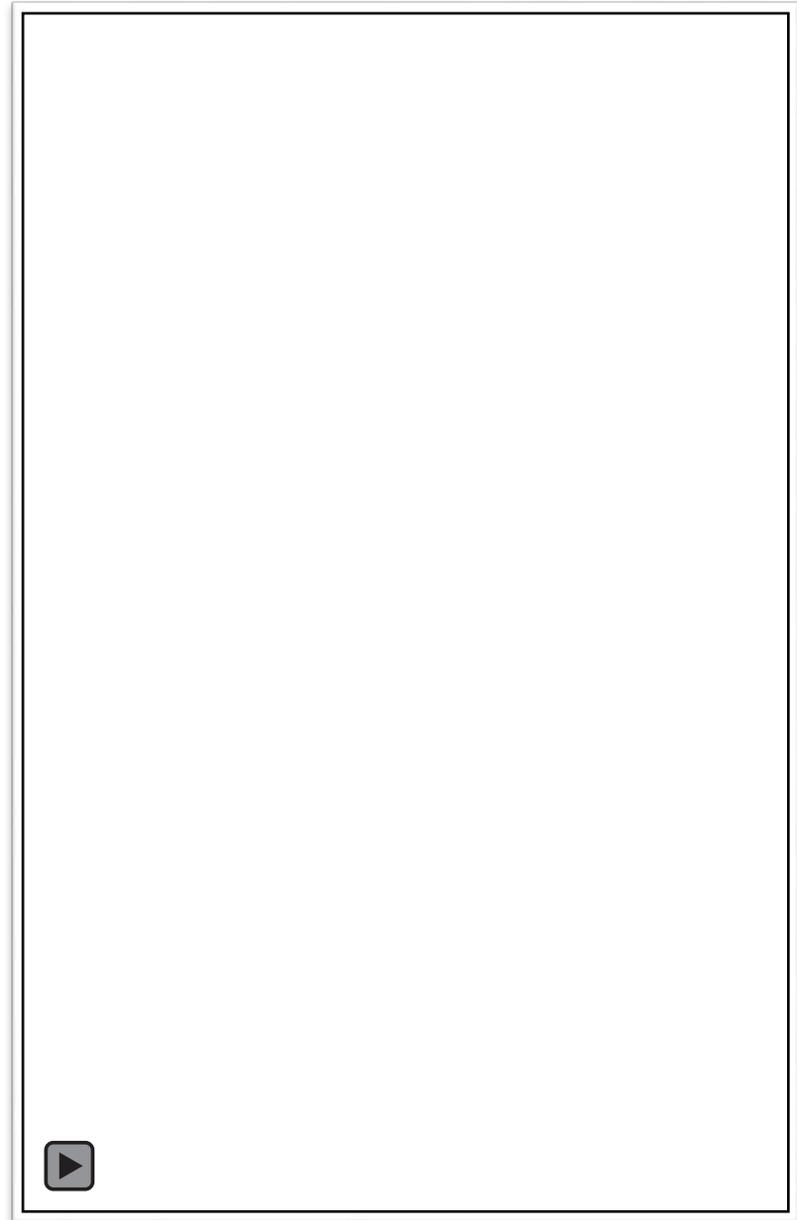
- Momentum and inertia are not common topics considered during safety, but are almost always present within a system.
- Question to ask - "Why do you think this matters?"
 - Consider all the rotating tools and objects on a jobsite. Have them name a few (grinders, saws, flywheels, spools)
- Question to ask - "Have you ever had an incident or near miss caused by rotational Kinetic Energy?"
 - If so, how did it occur?
 - What were the outcomes; medical care, missed work, etc.

Use the Demo

- The demo is adjustable on multiple levels
 - The amount of mass can be adjusted from no extra weight (wheel only) to as much as the demonstrator would like.
 - The mass location can be adjusted at one inch intervals to compare how the location of the mass in relation to the axis of rotation effects the amount of energy required to spin the wheel.
 - The handle can be inserted at different locations to compare the energy required to rotate the wheel.
 - The further the mass from the axis of rotation, the greater the impact it has on KE.
 - The faster the wheel is spun, the more KE is system has
 - Conservation of Energy states that energy cannot be created or destroyed. Therefore, the increase in energy required to spin the wheel increases the amount of KE the system will release in the event of an incident.

Use the Demo

- Find 2-4 wheel layouts (weight location, weight amount, handle location) that support the theory you want to reinforce. This will ensure the audience understands the key concepts before they adjust the variables as they would like.
- The presenter can initially demonstrate the action. Then, have members of the audience test the demo so they can experience the change in energy in the system.



Why Does it Matter?

- Rotating objects on a construction site are common. Between tools and machinery, there are always objects moving.
- Keeping ourselves safe
 - Wear appropriate PPE when working with rotating objects such as leather gloves, safety glasses, and additional protective clothing to exposed body parts
 - Make sure rotating tools and equipment are in good working order
 - Use the right tool for the job. Bigger isn't always better.
 - Use tools with preventive features that help minimize the negative outcomes from a release of the rotational energy
 - Always consider, "How heavy, how big, and how fast?" when evaluating the amount of energy in a system