Simple Machines

Spoken Tutorial Project
https://spoken-tutorial.org
National Mission on Education through ICT
http://sakshat.ac.in

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Learning Objectives

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- **Simulate the working of a pulley system**

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- **Calculate the torque**

System Requirements

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- **Ubuntu Linux OS v 16.04**

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- **Firefox Web Browser v 62.0.3**

Pre-requisites

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- **Learner should be familiar with topics in basic physics**

Pulley

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Pulley

- A pulley is a simple machine that is used to lift heavy objects
- We can either use a single pulley or a combination of pulleys
- Ex. Pulleys can be used in wells, escalators, rock climbing, flag poles

Link for Apps on Physics

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https://www.walter-fendt.de/html5/phen

Apps on Physics

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- **Pulley System**

Apps on Physics

- **Pulley System**
- **Lever Principle**

Necessary Force

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- $F = (W_l + W_p)/4$

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- $F = (W_l + W_p)/4$
- W_l **is weight of the load**
- W_p **is weight of the loose pulley**

Assignment

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- **Change the weight of the load to 25 N and weight of the loose pulley to 10 N**

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- **Change the weight of the load to 25 N and weight of the loose pulley to 10 N**
- **Calculate the necessary force and verify your answer from the App**

Torque

- **Torque is the twisting force that tends to cause a rotation**

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- **Point where the object rotates is the axis of rotation**

Torque

- $\tau = F \times r_{\perp}$

Torque

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- **F is a force applied by the load**

Torque

- $\tau = F \times r_{\perp}$
- **F is a force applied by the load**
- **$r_{\perp}$ is a perpendicular distance from the fulcrum**

Assignment

- **A block weighing 5 N is kept at 0.5 m and a block weighing 3 N is kept at 0.6 m on the same side of the fulcrum**
- **How far blocks weighing 6 N and 1 N should be kept on the other side of the fulcrum to achieve a balance condition**

Summary

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- **Simulated the working of a pulley system**
- **Calculated the necessary force to pull the load**
- **Achieved a balance condition for the lever**
- **Calculated the torque**

Acknowledgement

- **These Apps were created by Walter-fendt and his team**

About the Spoken Tutorial Project

- **Watch the video available at https://spoken-tutorial.org/What_is_a_Spoken_Tutorial**
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Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- **Conducts workshops using spoken tutorials**
- **Gives certificates to those who pass an online test**
- **For more details, please write to contact@spoken-tutorial.org**

Forum for specific questions

- Questions in THIS Spoken Tutorial?
- Visit https://forums.spoken-tutorial.org
- Choose the minute and second where you have the question
- Explain your question briefly
- The Spoken Tutorial project will ensure an answer

You will have to register to ask questions

Forum for specific questions

- **The Spoken Tutorial forum is for specific questions on this tutorial**
- **Please do not post unrelated and general questions on them**
- **This will help reduce the clutter**
- **With less clutter, we can use these discussion as instructional material**

Acknowledgements

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