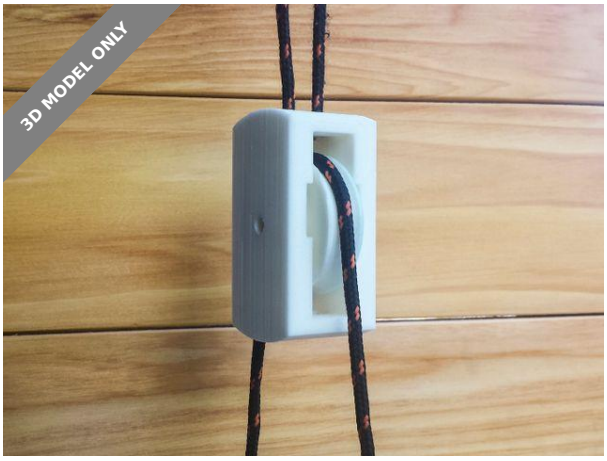

Project: Pulley systems

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VIEW IN BROWSER

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Summary

To demonstrate how simple and multiple chain hoist/pulley block work we need to have one or more pulleys.

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To demonstrate how simple and multiple chain hoist/pulley block work we need to have one or more pulleys. A functional single or multiple pulley is the result of this project. It can demonstrate the transmission of forces and weights in physics. During the design and construction process, the use of basic 3D geometry has been used.

Print instructions Licence: Creative Commons - Attribution Category: Engineering How I Designed This

To create the pulley, which consists of three parts, the addition and subtraction of basic geometric shapes has been used. The pulley wheel is formed by a cylinder and torus subtracted from it. Pin wheel consists of the

addition and subtraction of cylinders and the pulley housing is formed by a cutaway cylinder, from which other cylinders and cubes are subtracted. To create a multiple pulley, the number of wheels of the pulley can be set parametrically
All parts are designed for 3D printing.

Project: Pulley systems

Objectives

Students will be able to test and use in practice how pulley block, one of the first invented machines, works. Students will find out how to change the force required to lift the load when using more pulleys in various setups.

Wikipedia - Pulley

They may also work with inventing their own design of the pulley, in order to meet the principle, while being as simple and compact as possible.

Audiences

The function of the pulley block is usually part of the curriculum of secondary schools (11-years old pupils). Complex pulley blocks and designing your own pulley can bet he task for older students.

Preparation

The preparation for this project is the study of the fundamental principles of**Archimedes pulley**. Material: You also need to prepare several meters of rope with a diameter of 5-8 mm, steel rod with a diameter of 4 mm and a length of 500 mm and a 3D printer. Tools: We needed a hacksaw, hammer and scissors. Force measuring load cell can be used. And finally some burden, of course ;)

Steps

Students first create a pulley with one wheel and measure what force is needed to pull and how long piece of rope is needed to pull out.

They will continue adding additional wheels to pulley and measurements will be repeated.
Because the pulley block can be assembled in many ways, students can search as many variations andtest and describe their advantages and disadvantages of their design.

Results

The students of lower grades can construct various pulley blocks with a pulley from this project and only define the number of wheels of pulley. Students of higher grades can design their own pulley.

Model files

pulleys_v2.scad

pulleys_v2_case_2.stl

pulleys_v2_case_1.stl

pulleys_v2_case_3.stl

pulleys_v2_case_4.stl

pulleys_v2_wheel.stl

pulleys_v2_1.stl

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