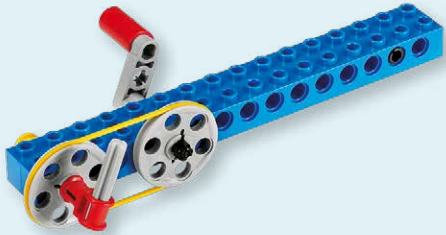


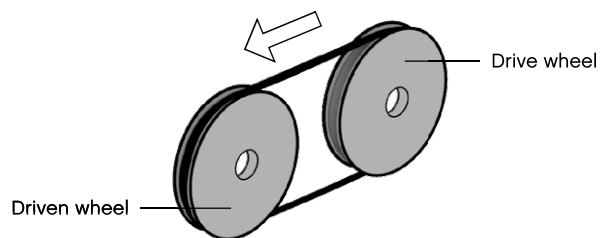
Pulley

Student Worksheet



Simple Machines: Pulley

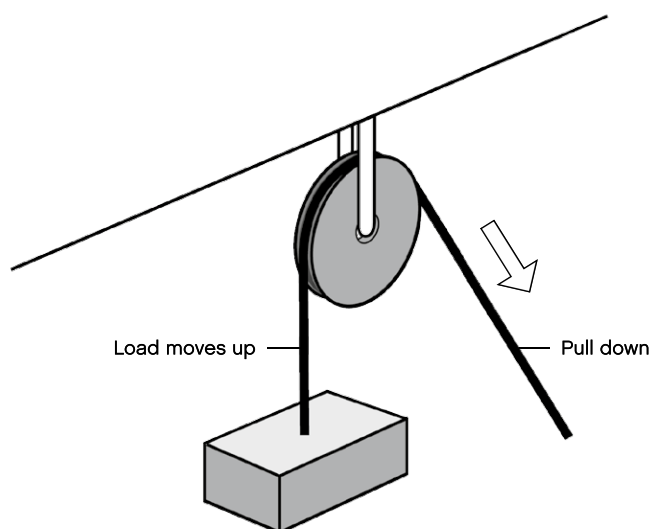
Pulleys are wheels that are moved by ropes, chains or belts around their rims.



In a belt driven pulley a continuous belt joins two pulley wheels. The wheel to which an external force is applied (effort) is called the drive wheel, and the other the driven wheel. The drive pulley wheel provides the input force and the driven pulley wheel delivers the output force. When the drive wheel turns the belt moves and causes the driven wheel to turn in the same direction. If the drive wheel is smaller than the driven wheel, the driven wheel will turn more slowly than the drive wheel.

Belt driven pulleys rely on belt friction to transmit motion. If the belt is too tight the belt will create wasteful friction forces on the pulley axle and bearing. If too loose the belt will slip and the effort is not used efficiently. Slip is an overload protection safety feature of belt-operated machinery.

For heavy lifting jobs; multiple pulley wheels can be combined into a lifting system that makes lifting heavy objects easier.



Using a single pulley to lift a load doesn't make it easier, but it changes the direction of motion without any gains in speed or required effort. It only allows you to lift a load up by the pulling of the rope. Pulleys can be either movable or fixed. The difference between fixed and movable pulleys are that fixed pulleys do not move up or down when the load is being moved. A fixed pulley is often fixed to an overhead beam or rafter and will only be able to rotate around its own axle. The use of multiple pulley wheels on one axle, in a lifting or dragging system, is called a Block and Tackle.

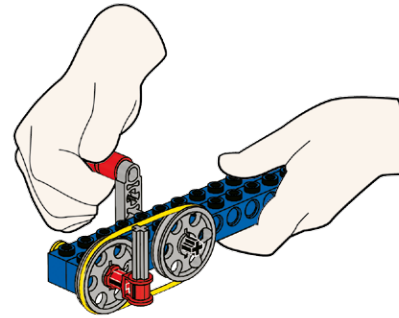
Common examples of pulleys are found in window blinds, curtains and flagpoles.

Did you know?
Pulleys started the age of mass production in England, when they were produced at the beginning of the 19th century to supply the British Royal Navy with pulley blocks for their war ships during the Napoleonic Wars.

C1

Build C1 book I, page 18

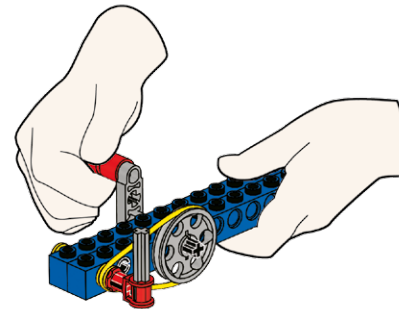
Turn the handle and describe the speeds of the drive and the driven pulley wheels. Then gently increase your grip on the output pointer and describe what happens.



C2

Build C2 book I, page 19

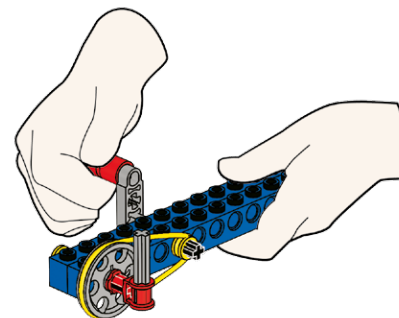
Turn the handle and describe the speeds of the drive and the driven pulley wheels. Then gently increase your grip on the output pointer and describe what happens.



C3

Build C3 book I, page 20

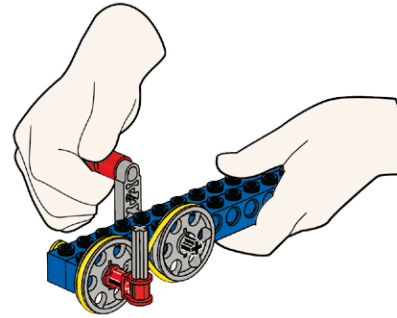
Turn the handle and describe the speeds of the drive and the driven pulley wheels. Then gently increase your grip on the output pointer and describe what happens.



C4

Build C4 book I, page 21

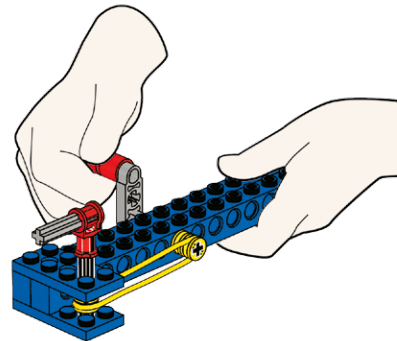
Turn the handle and describe the speeds of the drive and the driven pulley wheels. Then gently increase your grip on the output pointer and describe what happens.



C5

Build C5 book I, page 22 to 23

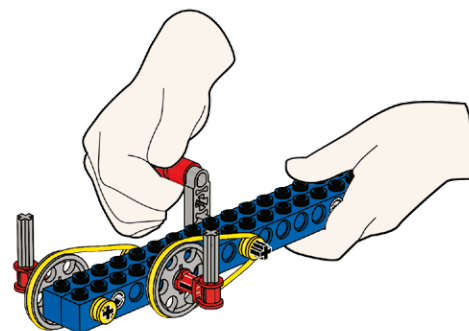
Turn the handle and describe the speeds of the drive and driven pulley wheels. Label the drive and driven pulley wheels. Use a circle to show exactly where each one is.



C6

Build C6 book I, page 24 to 25

Turn the handle and describe the speeds of the drive and driven pulley wheels. Label the drive and driven pulley wheels. Use a circle to show exactly where each one is.

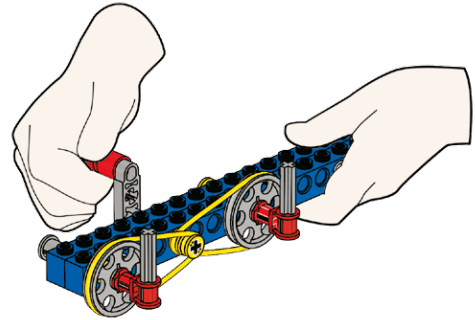


C7

Build C7 book I, page 26 to 27

Turn the handle and describe the speeds of the drive and driven pulley wheels.

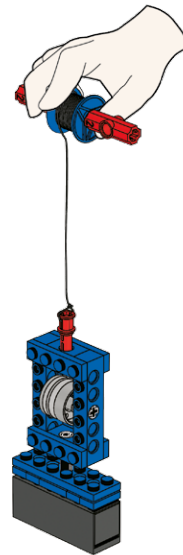
Label the drive and driven pulley wheels. Use a circle to show exactly where each one is.



C8

Build C8 book I, page 28 to 31

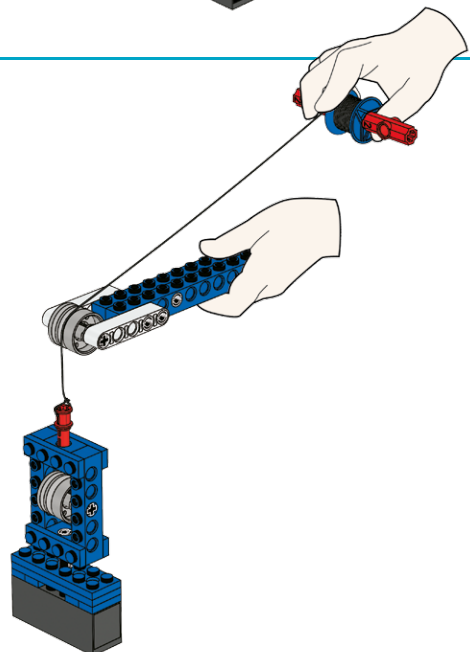
Lift the string to lift the load. Describe what happens.



C9

Build C9 book I, page 32 to 35

Pull the string to lift the load. Describe what happens.



C10

Build C10 book I, page 36

Pull the string to lift the load. Describe what happens.

