Scorpio Technology NEWSLETTER

INSIDE THIS ISSUE

TEACHER CONFERENCES & WORKSHOPS

Scorpio is attending or supports these Design & Technology teacher activities:

DATTA QLD - 16-17/06/2022 "Creative Integration", Brisbane Convention and Exhibition Centre

DATTA VIC - 17/06/2022 "Designing the Future", Banyule Nillumbik Tech School, Greensborough

DATTA ACT – Sat 10/09/2022, TECHnow Conference, Daramalan College, Cowper St, Dickson

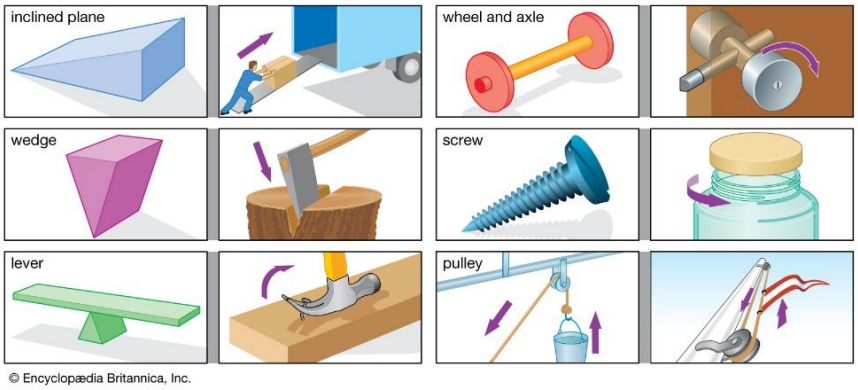
WELCOME

Welcome to Scorpio's May newsletter. Grab a cuppa and relax for an interesting read.

Remember, we're here to support you, however we can. Contact us at (03) 9802 9913 or email us at sales@scorpiotechnology.com.au

PRIMARY STEM: SIMPLE MACHINES

Simple machines have few or no moving parts that make hard jobs easier. The simple machines are the inclined plane, lever, wedge, wheel and axle, pulley, and screw. By conducting simple experiments students can gain an understanding of the role these machines play today and in times gone by.



© Encyclopædia Britannica, Inc.

https://www.britannica.com/technology/simple-machine#/media/1/1194584/149099

Check out Scorpio's Primary School catalogue for many great ideas suited to your classroom needs.
Click on link:
https://www.scorpiotechnology.com.au/catalogues

what's new!

Precision Screwdriver Set – 6 piece insulated (Code: SCREWDRINS6)

LED Magnifier Lamp – Desk Mount (Code: LEDMG LAMP)

LEARN TO MAKE, MAKE TO LEARN

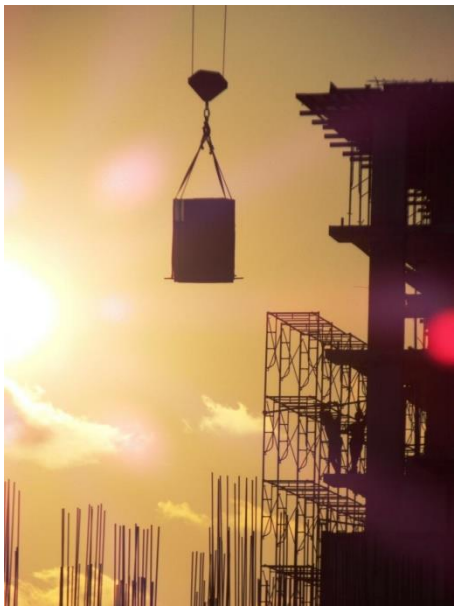
"Things don't have to change the world to be important."
Steve Jobs (1955 - 2011)

SCORPIO TECHNOLOGY Vic Pty Ltd,
1/31 Dalgety St. Oakleigh Vic 3166
www.scorpiotechnology.com.au

May 2022

Making lifting easier

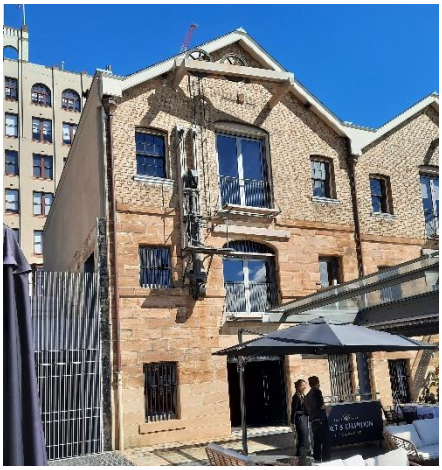
Written by Anita Vejins



"I want to be famous in the way a pulley is famous, or a buttonhole, not because it did anything spectacular, but because it never forgot what it could do."

Naomi Shihab Nye American writer (1952-)

Recently, while visiting Circular Quay and the Rocks area in Sydney, I was amazed to see so many buildings with pulleys. As Sydney Cove was the hub of transport and communications for the new settlement these pulleys served an important task.



Campbell Storehouses housed imports such as sugar, tea, and spirits from India. Pulleys that were used to hoist cargo can still be seen on the upper levels of the warehouses.

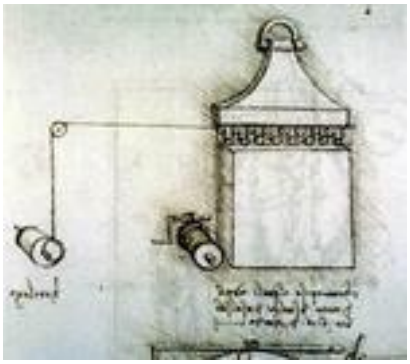
Further around the harbour tall ships can be seen displaying the pulleys and rigging used to hoist and lower the sails.

Man developed six **simple machines**. These made work easier by providing a mechanical advantage. These machines were a wedge, wheel and axle, lever, inclined plane, screw, and pulley.

Pulleys allow things to be moved with less effort.

The earliest evidence of pulleys dates back to Ancient Egypt in the Twelfth Dynasty (1991-1802 BCE) and Mesopotamia in the early 2nd millennium BCE. In Roman Egypt, Hero of Alexandria (c. 10-70 CE) identified the pulley as one of six simple machines used to lift weights.

Archimedes, a Greek mathematician, physicist, engineer, astronomer, and inventor (287-212 BC) has been credited as the inventor of the compound pulley system. He was said to have moved a 55 metre fully loaded an entire warship, laden with 600 men using a complex system of pulleys whilst sitting on the shore.



Many of Leonardo da Vinci's inventions made use of simple machines such as the robotic knight he designed for Ludovico Sforza. A system of pulleys and gears appear to allow the device to walk, sit, and move its jaw. In another invention he used a pulley system to brake the descent of a clock weight.

Pulleys in Everyday Life

Originally, the pulley was used for basic applications such as lifting a bucket to retrieve water from a well. Today, a wide range of household and commercial applications use the pulley system. Depending on the type of application, the pulley system can have a fixed axle, a movable axle, or a combination of both. Simply put, the more pulleys you have, and the more times you loop rope around them, the more you can lift.

Pulleys can be found in these and many more things:

- Elevators and escalators
- Cargo lift systems in warehouses and construction sites
- Construction cranes and bulldozers
- Tow trucks
- Weight-lifting exercise equipment
- Theatre curtains
- Pulleys allow window blinds to open or close
- A flag hoisted on a flagpole
- Fans with chains use a pulley system to be turned on and off.
- An extension ladder may have a pulley system.
- Sails on sailboats are raised and lowered using pulleys.
- Garage doors raise and lower utilizing a pulley system.
- Rock climbers use pulleys to help them to climb.

Scorpio Technology's **Belt Driven Car** kit utilises a pulley and belt system to connect an electric motor to the wheels of the car. The pulley connected to the motor shaft is called the driver pulley and the pulley connected to the wheels is the driven pulley. The driver pulley causes the driven pulley to turn.

The pulley and belt system is used to transmit the rotary motion and force from the motor to the wheels. By making suggested adjustments students can investigate how to increase or decrease speed using torque and more.

This kit has a comprehensive theory section that looks at pulleys in context to this kit. Please email Scorpio to get a free copy of this Teaching Unit (sales@scorpiotechnology.com.au).

REFERENCES

https://studiousguy.com/pulley-simple-machines-examples/
https://www.teachengineering.org
https://en.wikipedia.org/wiki/Pulley
https://www.globalmarvels.com/archimedes-the-greatest-mathematician-and-inventor/
https://en.wikipedia.org/wiki/Science_and_inventions_of_Leonardo_da_Vinci
https://info.designatronics.com/blog/pulleys-did-you-know
https://brunelleschi.imss.fi.it/genscheda.asp?appl=LIR&xsl=paginamanoscritto&lingua=ENG&chiave=100852

Pulleys suited to school experimentation and demonstration

Assorted pulleys (packs of 10)

- Pulley 5.5mm (Code: PU5.5 (Black)), (Code: PU5.5W (White))
- Pulley 10mm (Code: PU10)
- Pulley 30mm (Code: PU30)
- Pulley 50mm (Code: PU50)

Pulley – Plastic, Ball Bearing

- Single (Code: PUPH281A)
- Double (Code: PUPH281B)
- Triple (Code: PUPH281C)

Pulley – In Line – Plastic

- Single (Code: PUPS80)
- Double (Code: PUPA81)

Triple (Code: PUPA80A)

Pulley – Single Bench Mounting (Code: PH0290A)

Pulley with Universal Clamp – Large (Code: PUCLAMP70)

Large Vertical Pulley on Bench Clamp (Code: PUCLAMP

Differential Pulley – 4 Step (Code: PH0282D)

Pulley – 50mm dia – On Straight Alloy Rod (Code: MF2600-001)

Pulley – 50mm dia – On Offset Alloy Rod (Code: MF2600-020)

Pulley Demonstration kit for Students (Code: PH305)
Many possible configurations allow you to demonstrate a variety of concepts. Suits Years 6-12
Includes: 12 pulleys (8 single, 2 triple tandem, 2 quadruple); 3 rods, 81 × 1.25cm dia.; 8 collars with hook; 3 right-angle clamps; one wheel and axle; 4 cords.

Click here for links to pulleys:
https://www.scorpiotechnology.com.au/forcesenergymotion
https://www.scorpiotechnology.com.au/laboratory-general-equipment
https://www.scorpiotechnology.com.au/mechnical-components
https://www.scorpiotechnology.com.au/forces-energy-and-motion/pulley-demonstration-set-students

Why are pulleys despised by all other simple machines?
They have to be the centre of a tension.

A physicist, an engineer, and a mathematician go camping. They bring out a giant can of beans to eat but no one brought a can opener. The physicist says, "I know how we can open it; we can make a really hot fire and place the can in it. The internal pressure will rise and burst open the can." The mathematician says, "we can't do that, we'll lose half our beans that way!" The engineer chimes in, "I know what to do!" and quickly sets up a system of levers and pulleys. "We can drop this bolder on it and that will open the can." The mathematician says, "smashing it is the same problem! We'll lose half our beans that way." To which the others say, "Well, if you're so smart, what would you do?" The mathematician replies, "Well, first I would assume we had a can opener and then see what happens."