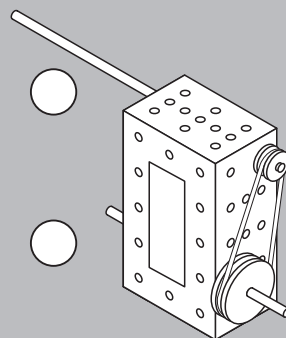




Visit TechCard at techcard.co.uk & Instagram & YouTube

Pulley Workshop

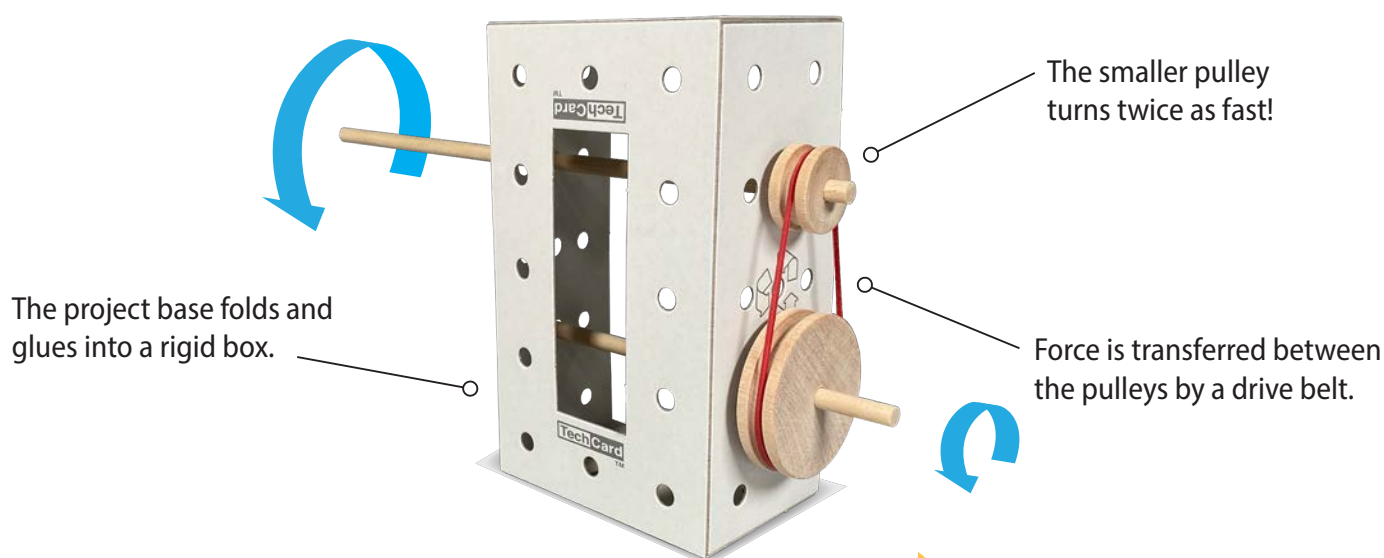
D&T Workshop Skill Level ● ● ○ ○ ○



Build a pulley box and arrange the pulleys to do different jobs!

Explore how pulleys & drive belts transfer and change forces.

See how to make with TechCard on our website.



Great for fairground rides projects!

Assembly videos on YouTube!

Parts to make 1 model

Structural Parts

TechCard Project Base 1

Mechanical Parts

300mm Dowel Axle 1
40mm Pulley 1
20mm Pulley 1
25mm Discs 2

Additional Materials

Rubber Band(s)

Example size: 75mm x 1.5mm is a No18 size)

You will have parts left over towards other models.

Parts to make 10 models

Structural Parts

TechCard Project Base 10

Mechanical Parts

300mm Dowel Axle 10
40mm Pulley 10
20mm Pulley 10
25mm Discs 20

Additional Materials

Rubber Band(s)

Example size: 75mm x 1.5mm is a No18 size)

Based on pupils sharing off-cuts between them.

What are pulleys?

Pulleys are wheels with a groove for a rope, cable or belt. Pulleys are a type of simple machine that help make work easier to do like making a machine go faster or lifting a heavy load.



What do pulleys do?

Pulleys transfer the forces that are applied to them. They can change the direction of a force and they can increase or decrease the power, speed and distance a force travels.



How are pulleys used ?

Pulleys are used in machines all around us. Cranes use pulleys to lift heavy loads. A washing machine uses pulleys to connect the electric motor to the spinning drum and a car uses pulleys to drive the fan belt.

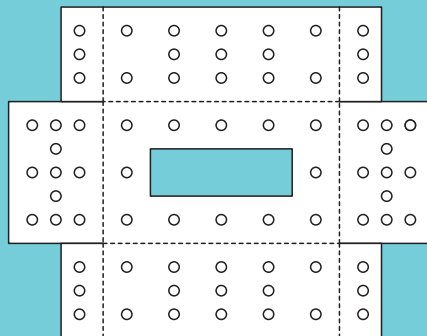


Make the pulley box.

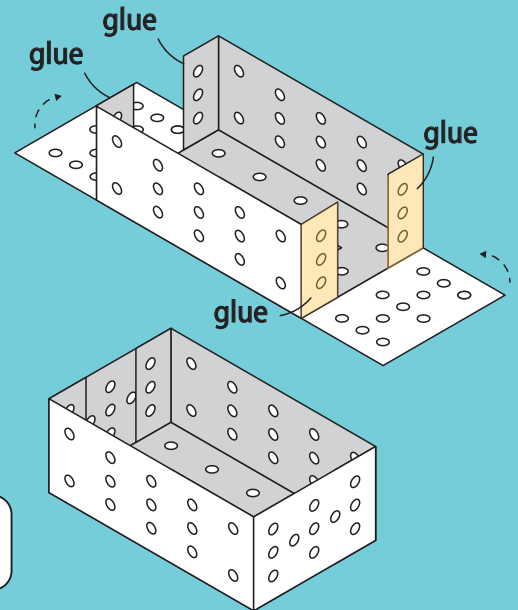


Before you start see
'Make with TechCard'
on our website.

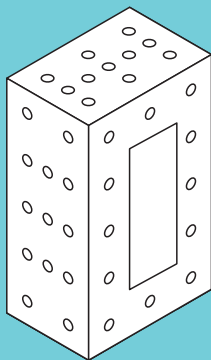
1 Make the box.



Fold and glue a TechCard Project
base to make the base.



2 Check the box.



Check the box is neat and
straight and the holes are clear.

3 Axles and pulleys.

You can build lots of projects with
these two axles and pulleys.

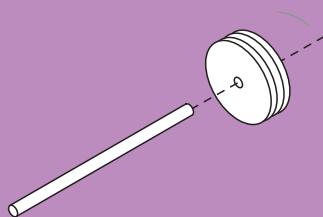
Cut a 110mm and
a 190mm axle.



Use one 20mm pulley
and one 40mm pulley.



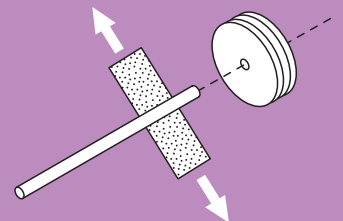
4 Check the pulleys.



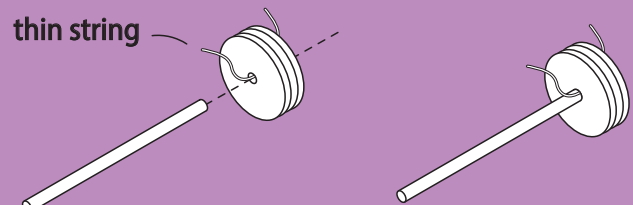
The axes should be a tight push-fit
into the pulleys.

4 Adjust the axles.

If the axles are too tight then
lightly sand them so they fit.



If the axles are too loose then fit a piece of thread
or thin string in the pulley to make a tight fit.



6 Assemble axles and pulleys.

Fit the 20mm pulley onto the end of the 190mm axle.

handle

Push the 40mm pulley along the 110mm axle leaving a handle.

7 Fit the pulleys to the box.

Fit the axles through the box.

8 Fit the drive belt and discs.

Secure the axles with two 25mm discs.

Fit the drive belt onto the pulleys.

9 Check the assembly.

handle

gap
gap

Check there is a gap between the 25mm discs and the box.

10 Try different arrangements.

You can also set up the box so the axles are vertical.

Try different rubber bands or change the distance between the axles.

11 Operate your pulley system.

handle

Turn the handle and the force will be transferred to the top axle by the drive belt.

Make it your own!

Is it a fairground ride or a colour wheel?



Your pulley system can power lots of things. Use more TechCard and add other materials to design and make your own machine!

Is it a food mixer?



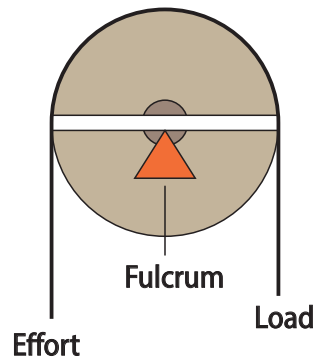
Is it the 'London Eye' or a tumble dryer?



Send us photos of your models so we can post them on Instagram!

The Science of Pulleys.

Pulleys are one of the six 'simple machines' which include the lever, the wheel and axle, the inclined plane, the screw and the wedge.

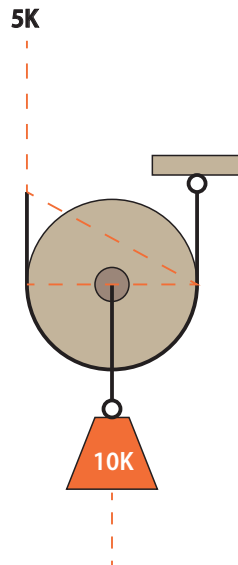


All the simple machines are variations of the lever which is arguably the most important 'machine' ever invented.

It's an 'exchange' not magic!

Machines make work easier by changing the forces applied to them.

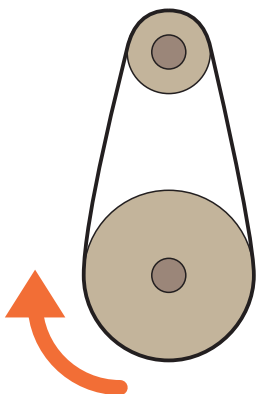
A 5K effort can raise a 10K load by exchanging the power of the force for the distance the force travels.



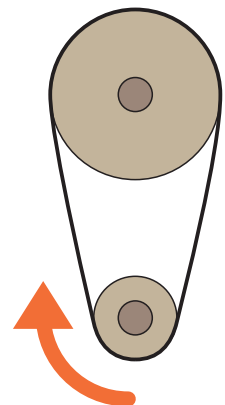
The 5K effort has to move twice the distance to raise the 10K load.

Large cranes can raise massive loads using combinations of pulleys but, in exchange, many meters of cable are wound onto a drum.

Power exchange.



When the large pulley drives the small pulley, the small pulley turns twice each time the large pulley turns once. The small pulley turns faster but with half the force.



When the small pulley drives the large pulley, the large pulley turns slowly but with twice the force.