

## Machines and Energy

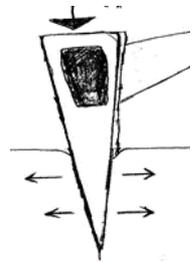
Simple machines allow a small force to have a much greater effect.

There are six types of simple machine which you need to know about. You can see examples of them all around you.

1 A WEDGE is a triangular shape. The sharp point or edge is used to cut through a material.

The force is concentrated into a very small area so the pressure increases and allows the wedge to split the material.

A nail, knife or an axe are wedges.



2 A LEVER is like a seesaw with a force on each end and in the middle is a point around which all the forces move. This is called the Pivot.



If the forces are the same distance and weight from the pivot, it is balanced.

If you move the pivot point closer to one end of the seesaw, it becomes a pole to lift heavier objects.

The Law of Moments can be used to work out the force needed.

3 A WHEEL AND AXLE is normally two wheels joined by an axle (a shaft), but some machines may only have one wheel and the axle.

Both the wheels and the axle always turn in the same direction and at the same speed.

There are many wheels bigger than you at the museum due to the huge forces involved and even one where a young person had to walk inside the wheel to turn it!



- 4 An **INCLINED PLANE** is simply a ramp. One end is higher than the opposite end.

It takes less work to move an object up a ramp than it does to lift that object up vertically.

A ladder is an inclined plane.



- 5 A **SCREW** is an inclined plane wrapped around a pole which holds things together or lifts materials.



A screw can hold the pieces of wood together, but it is also used in other countries to lift water.

This seat is lifted or lowered using a screw.

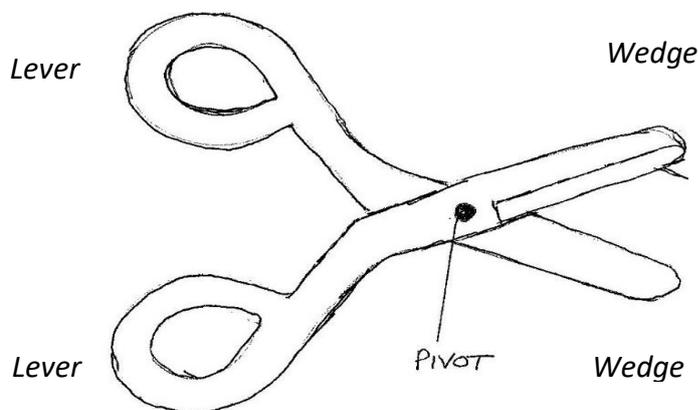
- 6 A **PULLEY** is a type of wheel and axle that is combined with a rope, chain or cord to pull something up and down or back and forth.

Window blinds have pulleys.

The more pulleys you have decreases the amount of starting force needed.



**COMPOUND MACHINES** have two or more of these simple machines working together to increase the range and usefulness.



A pair of scissors uses two levers and two wedges.

If the wedges are not kept sharp, then the force is spread out and the pressure is reduced, so the scissors feel blunt.

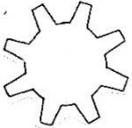
Can you find 5 examples of each simple machine around the school or at home?

Wedges	Levers
Wheel and axle	Inclined plane
Screw	Pulley

Draw a compound machine and show where the simple machines are within it.

Compound machine
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Finally, can you find any cogwheels? You will be exploring these more at the museum.

<p>Cogwheels</p> 
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