

# Jeavons Wood Primary School – Science Knowledge Organiser

**Topic: Forces**

**Year: 5**

**Strand: Physics**

## Big Question: How useful are forces?

### What should I already know?

- May have an awareness of how to make things stop and start.
- Compare how things move on different surfaces.
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance.
- Observe how magnets attract or repel each other and attract some materials and not others.
- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials.
- Describe magnets as having two poles.
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

### What will I know by the end of the unit?

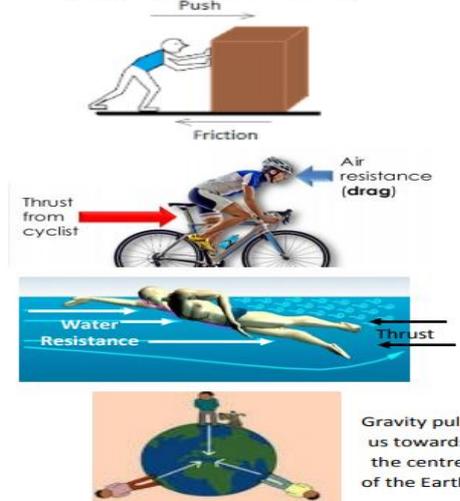
#### Forces

What is a force?	A force is either: <ul style="list-style-type: none"> <li>• A push or</li> <li>• A pull</li> </ul>
Forces can make things...	<ul style="list-style-type: none"> <li>• Speed up</li> <li>• Slow down</li> <li>• Change shape</li> <li>• Change direction</li> </ul>
A force that speeds something up	The child is pushing the car to speed it up. 
A force that slows something down	The girl is pulling the dog to slow it down. 
A force that changes the shape of something	The can is being squeezed so that it changes shape and becomes smaller. 
A force that changes the direction of something	When the ball is hit with the racket, it will change direction. 

#### Types of Forces

<b>Magnetism</b> Magnets attract or repel each other or other objects	Attract:  Repel:  North and South attract. But North and North or South and South will repel.
Air Resistance	<ul style="list-style-type: none"> <li>• Air resistance slows down moving objects, because air slows you down as you move through it</li> <li>• To travel faster through the air, things need to be streamlined.</li> </ul>
Water Resistance	<ul style="list-style-type: none"> <li>• Water resistance slows down moving objects, because water slows you down as you move through it</li> <li>• To travel faster through the water, things need to be streamlined.</li> </ul>
Friction	<ul style="list-style-type: none"> <li>• Friction happens when two surfaces touch each other.</li> <li>• Friction gives us grip.</li> <li>• Friction produces heat.</li> <li>• Rougher surfaces slow things down a lot.</li> <li>• Smoother surfaces don't slow things down as much.</li> </ul>

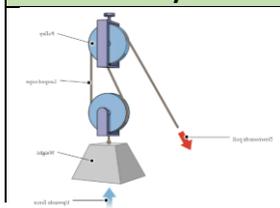
#### Diagrams of forces in action



#### Another Force

What is gravity?	Gravity is the forces that <b>pulls</b> objects <b>down</b> towards the centre of the Earth.  Gravity stops things from floating away into space.  When things go into the air (like a football) gravity pulls them back down.
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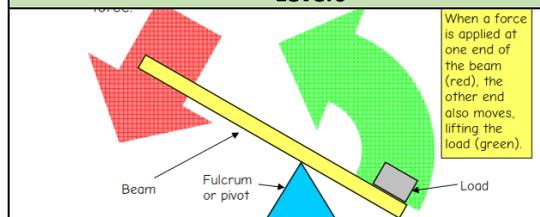
#### Pulleys



#### Gears



#### Levers



#### Vocabulary

Streamline	A shape that presents least resistance to air or water.
Gear	Wheels with teeth that slot together so that when one gear is turned, the other turns also. Gears of different sizes can be used to increase the power of a turning force.
Cog	The name of the 'wheel' or 'bar' in a gear.
Pulley	The looping of a rope over one or more wheels in order to lift heavy objects.
Lever	A long rigid body with a fulcrum which lifts a load, reducing the amount of effort needed to do so.
Mechanisms	Levers, pulleys and gears, that allow a smaller force to have a greater effect.
Grip	To have a good connection with a surface.
Drag	To cause to slow down.

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### Big Question: How useful are forces?

<b>Q1: Tick the things that describe a force;</b>	<b>Start of unit</b>	<b>End of unit</b>
Push		
Grip		
Drag		
Pull		

<b>Q2: Tick all of the contact forces;</b>	<b>Start of unit</b>	<b>End of unit</b>
Gravity		
Magnetism		
Water resistance		
Friction		

<b>Q3: Tick what a force can make things do;</b>	<b>Start of unit</b>	<b>End of unit</b>
Speed up		
Go uphill		
Change shape		
Slow down		
Change direction		
Change colour		
Turn over		

<b>Q4: Tick the options that explain why we streamline objects</b>	<b>Start of unit</b>	<b>End of unit</b>
To reduce air resistance		
To increase friction		
To increase gravity		
To reduce water resistance		

<b>Q5: Tick the simple machines that reduce the effort necessary to move/lift larger loads</b>	<b>Start of unit</b>	<b>End of unit</b>
Wheel		
Lever		
Gears		
Engine		
Pulley		
Jet		