

# TECHNOLOGYSTUDENT

## MOBILE REVISION

### LEVERS-FORCES-MOTION MOMENTS-CENTRE OF GRAVITY

This mobile revision pdf is based on detailed work found in the 'FORCES' section.

Tap on the green link button below to go to the complete website section



Tap the blue button to view all forces/movement covered by this Revision PDF



# FORCES AND MOTION

Tap on the title for information / revision.

1. TYPES OF FORCES

2. TYPES OF MOVEMENT  
AND MOTION

3. STRUTS AND TIES

4. STATIC AND DYNAMIC LOADS  
AND MECHANICAL ADVANTAGE

5. POTENTIAL ENERGY AND  
KINETIC ENERGY

6. CLASSES OF LEVER

7. CENTRE OF GRAVITY /  
CENTRE OF ROTATION

Tap on the image for detailed information

## STATIC LOAD STANDING STILL



The person is holding a stack of books, but he is not moving. The force downwards is **STATIC**.

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Tap the red button to return to the Contents page



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## DYNAMIC LOAD MOVING

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The person is carrying a weight of books, and walking. The force is moving or DYNAMIC.

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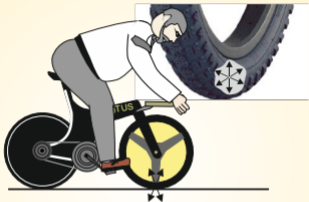
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## INTERNAL RESISTANCE

PUSHING BACK / RESISTING



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The person is sat on the bicycle and the air filled tyre is under great pressure. The air pressure inside it pushes back against his weight.

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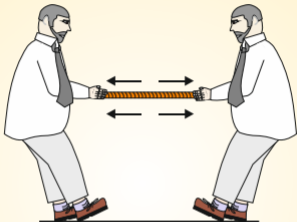


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## TENSION STRETCHING



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The rope is in "tension" as the two people pull on it. This stretching puts the rope in tension.

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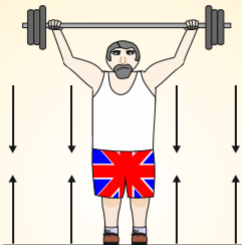


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## COMPRESSION COMPACTING



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The weight lifter finds that his body is compressed by the weights he is holding above his head.

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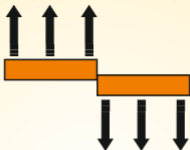
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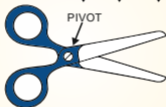
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## SHEAR FORCE

MOVING IN DIFFERENT DIRECTIONS



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A simple scissors - the two handles put force in different directions on the pin that holds the two parts together. The force applied to the pin is called shear force.

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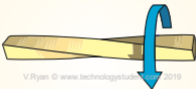
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## TORSION TWISTING



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The plastic ruler is twisted between both hands. The ruler is said to be in a state of torsion.

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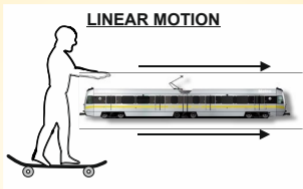
Tap on the link buttons below, to go to detailed information and exercises and a video on **FORCES – MOTION – MOMENTS OF FORCE – STRUTS AND TIES – EQUILIBRIUM – CENTRE OF GRAVITY – LEVERS – POTENTIAL ENERGY AND KINETIC ENERGY**. Ideal for revision.



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Tap on the image for detailed information



Linear motion is movement in a straight line and in one direction.

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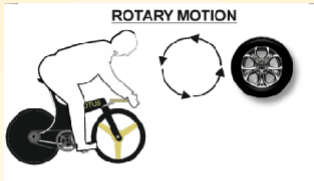
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Tap on the image for detailed information



This is movement following a circular path, around a fixed point.

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## OSCILLATING MOTION



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Oscillating motion occurs when an object swings left and then right (or vice-versa), from a fixed point.

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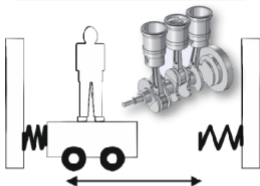


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## RECIPROCATING MOTION



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Reciprocating motion is a repetitive movement left to right OR up and down.

Tap the blue button for the next page on forces and motion.



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Tap on the link button below, to go to an exercise on **TYPES OF MOVEMENT AND MOTION**. Ideal for revision.



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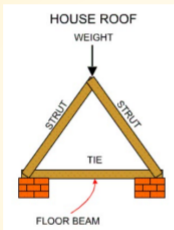


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## STRUTS AND TIES

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Tap on the image for examples



All structures have forces acting on them. You should have an understanding of tensile, compressive and shear forces. The part of the structure that has a tensile force acting on it is called a TIE and the part that has a compressive force acting on it is called a STRUT.

Tap the blue button for the next page on forces and motion.



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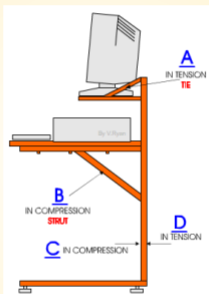




## STRUTS AND TIES

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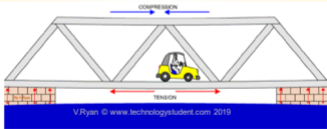


## MORE FORCES IN ACTION

The bridge below is a common type called a Box Girder Bridge.

When a vehicle crosses the bridge each member experiences some type of force. The diagram shows that the part the car rests on, is under tensile force (in tension) as it stretches under the weight of the car. As the bridge bends, the top member is compress (under a compressive force).

**Tap on the image** for detailed information



Tap the blue button for the next page on forces and motion.



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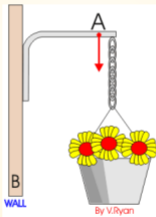


## MORE FORCES IN ACTION

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The bracket holding up the hanging basket is made of steel.  
What are the forces acting on it?

**Tap on the image** to check your answer



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## A STATIC LOAD

A person stands still at the centre of the tightrope. The tightrope dips with the weight applied to it and stays in that position.

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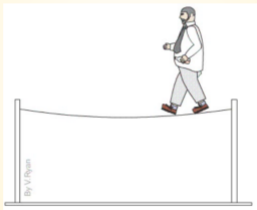


## A DYNAMIC LOAD

The person starts to walk across the rope. He is now a dynamic load.

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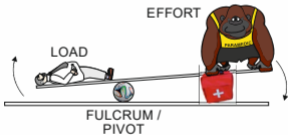


## MECHANICAL ADVANTAGE

An attempt is made to lift an injured person. A plank has been placed under his body and it will be used as a 'lever'. A football is used as a fulcrum. A fulcrum is the point at which a lever pivots. Using a lever makes it easier to lift the person. This is a good example of mechanical advantage

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# POTENTIAL ENERGY AND KINETIC ENERGY

Potential Energy is 'stored' energy, that is not moving, it is stationary and yet has the 'potential' to move.

Kinetic energy is released when an object moves.

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**POTENTIAL ENERGY**



**KINETIC ENERGY**



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## WHAT IS A LEVER?

Levers are used to lift heavy weights with the least amount of effort. The weight on the left hand side is moved by the person, because of the lever. The longer the 'lever' the easier it is to lift the weight.

**Tap on the image** for detailed information



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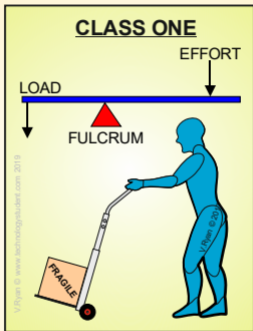
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## A CLASS ONE LEVER

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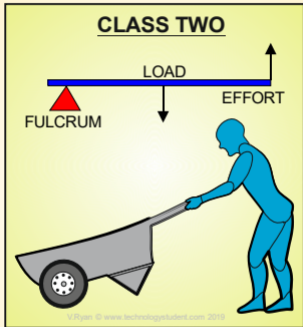


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## A CLASS TWO LEVER

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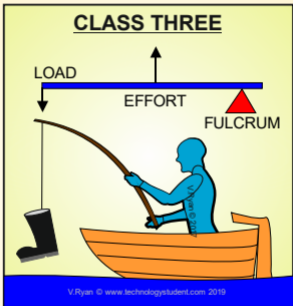


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## A CLASS THREE LEVER

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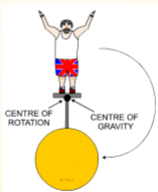


## WHAT IS 'CENTRE OF GRAVITY'?

The centre of gravity of an object is generally understood, as the centre of the object's weight distribution. This means that if an object can rotate around its centre of gravity, it will balance at that point.

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