

1.



Force

BEYOND

2.



Newton's First Law of Motion

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3.



Newton's Second Law of Motion

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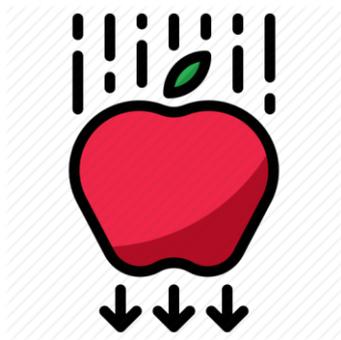
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Newton's Third Law of Motion

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5.



Gravity

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6.



Muscular Force

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7.



Air Resistance

BEYOND

8.



Ground Reaction Force

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2.

Force is required to cause:

- An object/body at rest to move
- A moving object/body to change direction, accelerate or decelerate.
- An object/body to change shape.

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1.

A push or pulling action applied upon an object.
Measured in Newtons or N.

Force (N) = mass (kg) x acceleration (a)

$F = ma$

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4.

'For every action there exists an equal and opposite reaction.'

Example: a hockey player will exert a force on an opponent, the opponent will exert a force of equal/opposite force back. This will decelerate the opponent and potentially accelerate them in the opposite direction.

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3.

An object will accelerate when acted upon by an external force. The acceleration of the object is proportional to this force and is in the direction by which the force acts.

Example: a shuttle in badminton will accelerate when hit by a racquet. The shuttle will reach a maximum speed and then begin to decelerate as air resistance and gravity apply forces to slow it down.

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6.

A push or pull applied to an object, provided by muscular contraction.

If you didn't apply enough muscular force to when releasing the ball, it might not reach your teammate.

Question: What would happen if you applied too much muscular force?

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5.

The force that attracts a body towards the center of the earth, or towards any other physical body having mass.

Question: How does gravity affect a ball being passed between players?

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8.

The reaction to the force that the body exerts on the ground.

Example – a sprinter in the starting blocks. The sprinter pushes against the blocks, allowing the sprinter to make an explosive burst.

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7.

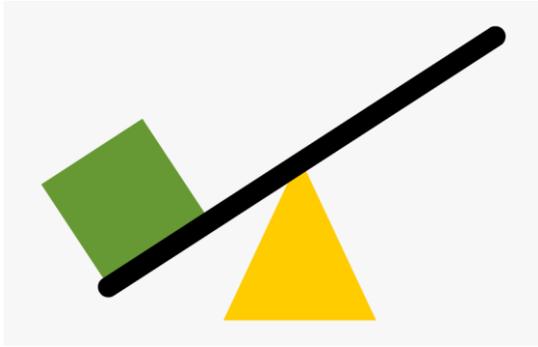
The frictional force that air applies against a moving object.

Air resistance will affect the distance and accuracy of the object you are passing or kicking.

Question: Can you think of a scenario when air resistance might affect your performance?

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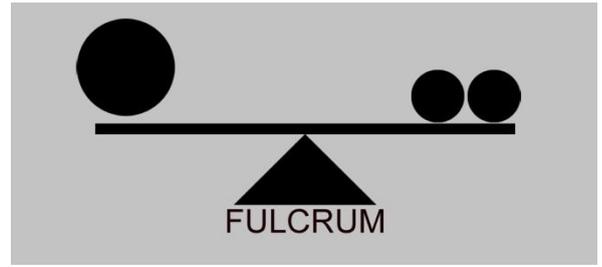
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Lever

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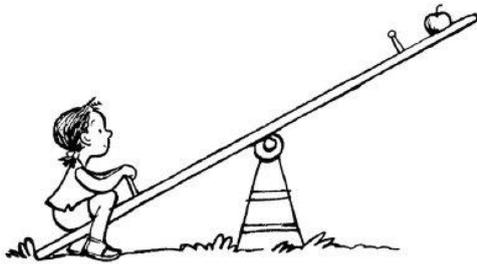
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Fulcrum

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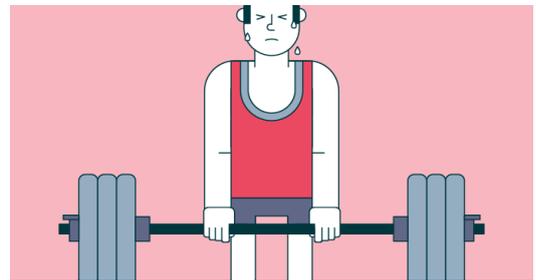
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Resistance

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12.



Effort

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13.



First Class Levers

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14.



Second Class Levers

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15.



Third Class Levers

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16.



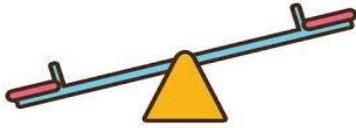
Helpful Hint

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10.

A fixed point about which the lever can turn, sometimes referred to as the axis or pivot.

Think of a seesaw:



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9.

A bone or bones that turns around an axis to create movement and contains 3 main components:

- Fulcrum
- Resistance
- Effort

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12.

The amount of force required to move the load.

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11.

The load or weight that the lever must move.

The load or weight could be body part or dumbbells.

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14.

A second-class lever has the resistance between the fulcrum and the effort.

An example is lifting a wheelbarrow.

The effort used to move the load can be much less than that of moving the load itself.

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13.

A first-class lever is a simple seesaw. The fulcrum is in the middle and the resistance and effort are at either side.

Example: Nodding your head is an example of a first-class level.

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16.

A class **1** lever has the **F**ulcrum in the centre.
A class **2** lever has the **R**esistance at the centre
A class **3** lever has the **E**ffort at the centre.

1, 2, 3 – F, R, E.

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15.

A third-class lever has the effort placed between the fulcrum and the resistance.

Example: a bicep curl.

Third-class levers require more work to perform a task and they can move with greater ranges of motion and increased speed.

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