

PROJECT

COLLECT INFORMATION ABOUT THE APPLICATIONS OF NEWTON'S THIRD LAW

- Title of the project** : Applications of Newton's third law in our daily life.
- Purpose of the project** : To Know about the applications of Newton's third law in our daily life.
- Hypothesis** : The three laws of motion were first compiled by Isaac Newton in his "Philosophiae Naturalis Principia Mathematica" (*Mathematical Principles of Natural Philosophy*), first published in 1687. Newton used them to explain and investigate the motion of many physical objects and systems. The third law states that "**For every action, there is an equal and opposite reaction**".
- Material** : Internet, 9th class physical science text book, balloon, straw, tread and spring balances.
- Proceedure** : We collect information from different sources about the applications of Newton's Third law. We collect some pictures about the applications of newton's third law. An experiment was conducted by me about the Newton's third law. According to gathered information we have prepaed a project report.

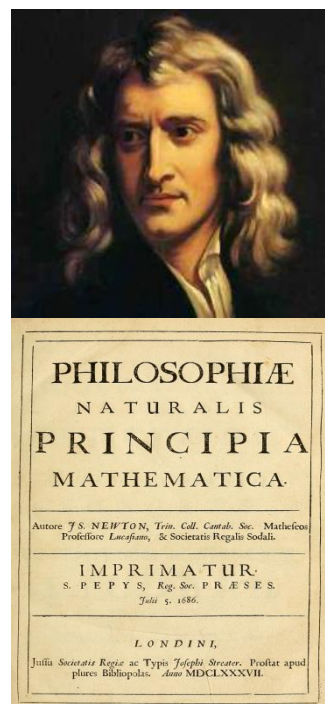
Introduction :**Newton's laws of motion:**

The three laws of motion were first compiled by Isaac Newton in his *Philosophiae Principia Mathematica* (*Mathematical Principles of Natural Philosophy*), first published in 1687. The first law states that an object at rest will remain at rest unless acted on by an unbalanced force. An object in motion continues in motion with the same speed and in the same direction unless acted upon by an unbalanced force. This law is often called "the law of inertia". Second law states that the Acceleration is produced when a force acts on a mass. The greater the mass (of the object being accelerated) the greater the amount of force needed (to accelerate the object). The third law states that every action there is an equal and opposite re-action.

Newton's third Law: The third law states that every action there is an equal and opposite re-action.

This means that for every force there is a reaction force that is equal in size, but opposite in direction. That is to say that whenever an object pushes another object it gets pushed back in the opposite direction equally hard.

The third law states that all forces between two objects exist in equal magnitude and opposite direction: if one object A exerts a force F_A on a second object B, then B simultaneously exerts a force F_B on A, and the two forces are equal and opposite: $F_A = - F_B$. The third law means that all forces are interactions between different bodies, and thus that there is no such thing as a unidirectional force or a force that acts on only one body. This law is sometimes referred to as the action-reaction law., with F_A called the "action" and F_B the "reaction". The action and the reaction are simultaneous, and it does not matter which is called the action and which is called reaction; both forces are part of a single interaction, and neither force exists without the other.



Process:**To know the opposite forces:**

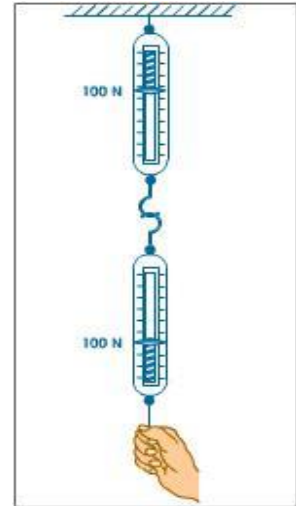
Hook two spring balances as shown in the diagram and pull from either side. You will notice that the pointers on the spring balances read equally (say 100 N). This shows that both the spring balances are registering equal force.

Observations:

- 1) The readings on the two spring balances are equal.
- 2) If we pulled the spring balance more, then the reading are changes but they are same.

Result :

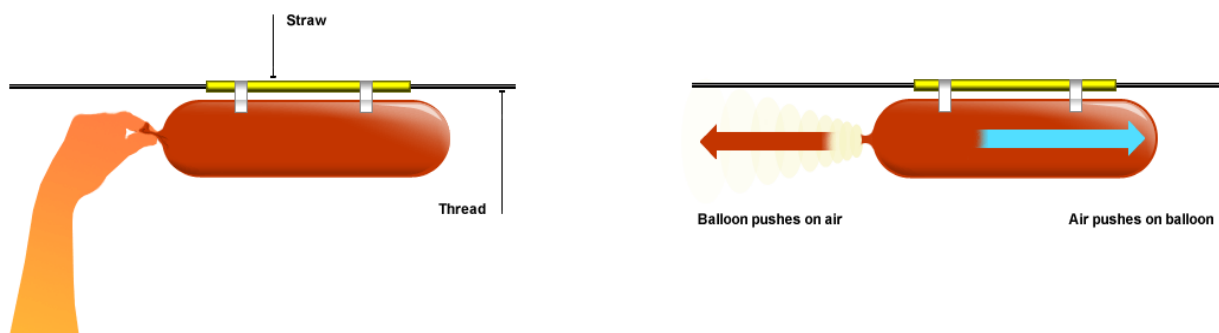
When one object exerts a force upon a second object, the second object exerts an equal and opposite force upon the first object.

**Balloon – Straw Experiment:****Materials:**

- balloon
- drinking straw
- string
- tape
- printout of worksheet.

Procedure:

- Slide the drinking straw onto a piece of string.
- Place two loops of masking tape onto the straw.
- Blow up the balloon to its maximum capacity (greatest volume). Hold tightly onto the neck of the balloon so that no air escapes, and attach the balloon to the two pieces of tape. The neck of the balloon should be parallel to the string.
- Release the neck to let the air rush out of the balloon.

**Observations:**

- 1) When the air rush out to the balloon, the balloon with straw travelled opposite side.
- 2) Air rush out to the balloown is an acton and the balloon travelled with straw is a reaction.

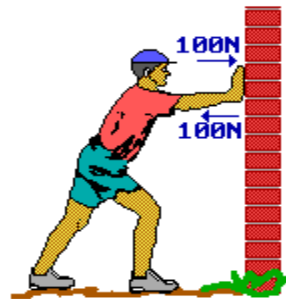
Result: The third law states that every action there is an equal and opposite re-action.

Applications:

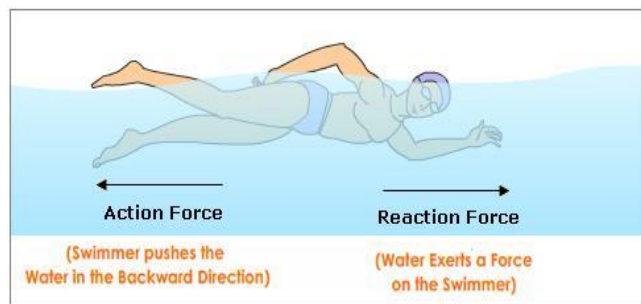
- 1) When you walk forward you push your foot back wards on the ground. The earth pushes your shoe forward.
- 2) As birds push down on the air with their wings the air pushes their wings up and gives them lift.



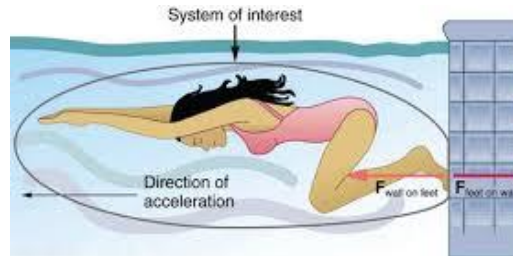
- 3) The fish uses its fins to push water backwards. In turn the water reacts by pushing the fish forward, moving fish through the water.
- 4) if someone pushes horizontally against a wall with a force of 100 N, then the wall will push horizontally against the person with a force of 100N.



- 5) In Rocket, Various fuels are burnt in the engine produces hot gases. The hot gases push against the inside tube of rocket and escape out the bottom of the tube. As the gases move down ward, the rocket moves in opposite direction.
- 6) Arms push against the water, water pushes swimmer ahead.



- 7) When bullet is fired from a gun the force sending the bullet forward is equal is equal to the force sending the gun backward. But due to the high mass of the gun, it moves a little distance backward and gives a backward jerk or a kick to shoulder of the gunman. Gun is said to be recoiled.
- 8) When a swimmer turns, the pool wall pushes against the swimmer with the same force as the swimmer pushes against the pool wall.



Precautions:

- 1) The spring balance should be brought in elastic mode before doing the experiment.
- 2) The second spring balance should not be pulled beyond its elastic limit.
- 3) The reading of the spring balance should be taken without any parallax error.
- 4) We should blow the balloon in its volume limit.

Interpretation of the student: We collect the information of daily life applications of Newton's third law from Internet. We have done an experiment to prove the Newton's third law. We have done an experiment of spring balances to show that "action and reaction forces are same".

Conclusion: After completion of the project we conclude that "**For every action, there is an equal and opposite reaction**". To prove the law we have done some experiment with the help of our teachers. We collect information about the applications of Newton's third law from internet. We know the various daily life examples of Newton's third law.

Analysis: In the above collection of the applications of Newton's third law. We observed that "For every action, there is an equal and opposite reaction"

PROJECT REPORT

Title of the Project	: Applications of Newton's third law in our daily life.
Class	: 9 th
Subject	: Physics
School	: Z,P.High School, Lolugu, Ponduru Mandal, Srikakulam district
Time frame	: 7 రోజులు

Material/Sources used tools: Internet, News paper clippings, Science books, laboratory equipment.

Details of procedure followed:

- We collect data about the applications of Newton's third law from Internet and various Science books.
- We understand the Newton's third law by the balloon-straw experiment.
- We understand the use of the Newton's third law in our daily life. And we also know that the various equipment prepared by the Newton's third law. Ex: Rocket.

Finding Observations:

- ❖ Newton's third law used in our walking.
- ❖ This law is applicable when a swimmer jumped in the swimming pool.
- ❖ This law helps to flying the birds and swimming the fishes.

Experiences faced: when we collect information about newton's law from internet we know the process to search the results from internet. We use balloons and tread experiment to prove the Newton's third law.

Project outcome : After completion of the project we conclude that "**For every action, there is an equal and opposite reaction**". To prove the law we have done some experiment with the help of our teachers. We collect information about the applications of Newton's third law from internet. We know the various daily life examples of Newton's third law.

Name of the group members and work allotment:

Sl.No	Name of the team member	Work allotment
1		
2		
3		
4		
5		
6		

Date of Submission :

Signatures

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