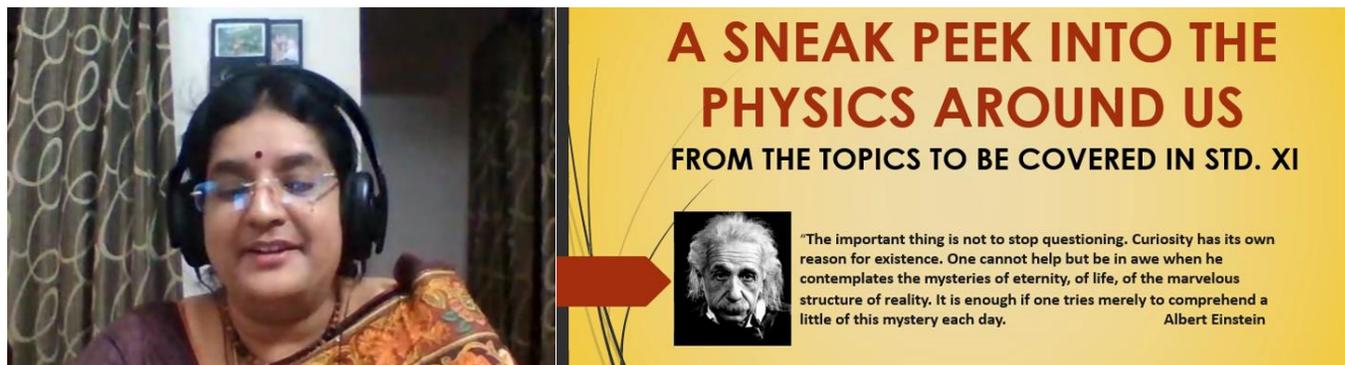


The Omnipresence of Physics!

A Sneak Peek into the Physics Around Us!

“One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality.”

~Albert Einstein



The video module titled ‘A Sneak Peek into the Physics Around Us’ sent to the students of Standards 10, 11 and 12 of all the branches of the PSBB group of schools, turned out to be a virtual eye-opener to them, besides enthralling them as well! It was a continuation of the ‘Stimulations’ venture of the institution, to provide an enriching learning experience to students.

Presented by Mrs. Srividhya Chandrasekaran, senior Physics teacher of PSBB Nungambakkam, the video ignited curiosity in students by providing insights into various principles of physics, shedding light on the mysteries of the world. Emphasizing the importance of inquisitiveness, she encouraged students to keenly observe and question the various occurrences around them.

The video deconstructed and explained the science behind phenomena which are often taken for granted. Intriguing and complex concepts were showcased through seemingly mundane events that occur on a daily basis, such as the simple act of walking, which is made possible by Newton’s Third Law, and the gift of flight enjoyed by birds, which is a result of Bernoulli’s Principle, Vector addition and Newton’s Laws.

Raindrops fall gently to the earth as a result of two forces opposing gravity, The liquid flowing through a pipe moves at a greater velocity, called the Equation of Continuity. The smaller the area of the cross-section of the pipe, the faster it flows, making it possible to enjoy a quick shower before getting ready for school.

The principles of physics can be seen in Sports as well. To be able to ‘hit a six’ in cricket, one must not only strike the ball with the right amount of force, but also take care of the

angle of deflection. The Magnus Effect is why a spinning ball's trajectory is so difficult to gauge, making it difficult for a batsman.

Door knobs are placed on the opposite side of the door from its hinges, as the further the point of application of force from the axis of rotation, the greater the Torque- the turning effect of force.

Riding a bicycle to school is made easier by the fact that one needn't continuously pedal until one reaches school, but can stop pedaling at intervals without stopping the cycle. This is due to the Moment of Inertia of the bicycle wheel, which is the tendency of a body to resist angular acceleration/deceleration. One can easily turn corners on one's bicycle by leaning one's body towards the turn, as a component of the normal reaction force adds on to the centripetal force provided by friction, allowing the cyclist to move his /her bicycle on a circular path.

When a lamp is filled with oil, the oil rises in the long narrow spaces between the threads, as these spaces act as capillary tubes. This is known as 'Capillary Action'. These were some of the concepts of Physics which were broken down for better understanding ,using familiar examples from everyday life and activities.

A video clip showing a glass of water being swung in a vertical circle without any spilling of the water, and an explanation of how that was possible due to the glass being swung at the right velocity, was the highlight of the intriguing video presentation, bringing it to a close.

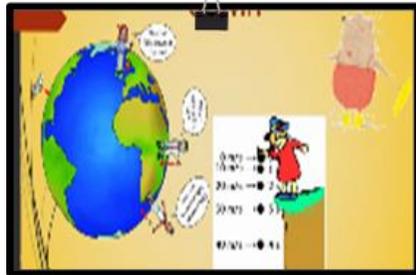
The detailed explanations were supplemented with fascinating examples, as well as visual aids- in the form of pictures, cartoons, diagrams, and videos, promoting greater understanding, and inspiring a sense of fun and enthusiasm.

Mrs. Sheela Rajendra, Dean and Director & Correspondent of the Institution stated in her personal message, sent along with the video, that the purpose behind the Stimulations series is "to enable students to see the Scientific Principles in the real world."

This fascinating module indeed went a long way in cultivating a keen interest in Physics in the students, besides promoting a better understanding of the concepts, which are omnipresent in everything around .

A memorable and exciting 'peek' indeed!





BIRD FLYING IS A RESULT OF VECTOR ADDITION, BERNOULLI'S PRINCIPLE AND NEWTON'S LAW

- Weight of the wings is action and the reaction is the force exerted by air.
- OA and OB are the directions of reaction force and the resultant of these two forces is OC, the lift on the bird.

PROJECTILE MOTION

WALKING- NEWTON'S LAW

- While walking, what you do is push the ground backward with your feet to help you move forward. So, here the ground tries to oppose the force exerted by your feet by applying a frictional force in the opposite direction.
- The forces on your feet are the normal force (the reaction force of your weight) and the frictional force and the net reaction force is what helps us to move forward.

TORQUE- TURNING EFFECT OF FORCE

- The turning effect of force or torque depends on the direction of force and the point of application of force.
- Further the point of application of force from the axis of rotation, greater is the torque.
- Perpendicular force exerts maximum torque.

MOMENT OF INERTIA OF A BICYCLE WHEEL

In a bicycle, the moment of inertia (MI) of the wheel is increased by concentrating most of the mass of the rim of the wheel and connecting the rim to the axle through spokes. Even after we stop pedalling, the wheels continue to rotate for sometime due to the large moment of inertia.

BENDING OF A CYCLIST

A QUICK SHOWER!

From equation of continuity for steady flow of a liquid, $A_1 v_1 = A_2 v_2$. Thus smaller the area of cross-section, greater is the velocity.

CAPILLARY ACTION

Oil rises in long narrow spaces between the threads of a wick, the narrow spaces act as capillary tubes.

MAGNUS EFFECT

From Bernoulli's theorem, when kinetic energy of air increases, the pressure energy decreases. The difference in pressure causes the spinning ball to deflect.

SWING A GLASS OF WATER IN A VERTICAL CIRCLE

Thinking should become your capital asset, no matter whatever ups and downs you come across in your life.

- Dr. A.P.J. Abdul Kalam