

# Demonstrating Pascal's Law with the Help of Hydraulic Lift Experimental Model

## Introduction:

- The report, written by Supratim Roy during an internship at IIT Guwahati under Prof. Uday Shanker Dixit, aims to demonstrate Pascal's Law using a hydraulic lift experimental model.
- Pascal's Law states that any force applied to a confined fluid is transmitted uniformly in all directions throughout the fluid.

## Pedagogy:

- Emphasizes the importance of pedagogy in education, highlighting improved quality of education, team learning, non-monotonous learning, convenience for special students, and enhanced student-teacher communication.

## Pascal's Law and Applications:

- Pascal's Law is explained with practical applications such as hydraulic lifts, hydraulic jacks, and hydraulic presses.
- The history of Pascal's Law is briefly discussed, noting its application in ancient Mauryan fountain structures and other water lifting devices.

## Hydraulic Lift:

- Defined as a device that uses force created by pressure on a liquid inside a cylinder to move a piston upward.
- The methodology behind hydraulic lifts is based on Pascal's Law, demonstrating how a small force applied at one end can lift a larger weight at the other end.

## Experimental Model:

- The hydraulic lift model was designed in Siemens NX CAD and assembled using various materials including acrylic sheets, foam pads, a water bottle, a weight box, colored water, a transparent ruler, double-sided tape, and epoxy resin.
- The experimental trial involved using syringes to demonstrate the mechanism, showing how a small displacement at one end results in a larger displacement at the other end.

### **Calculations and Results:**

- Detailed calculations were performed to determine the lift and force applied, demonstrating the principles of Pascal's Law in a practical setting.
- The model successfully demonstrated the law, showing that a small force applied at the piston end could lift a larger weight at the ram end.

### **Conclusion:**

- The hydraulic lift model serves as an effective educational tool for demonstrating Pascal's Law, enhancing the understanding of fluid dynamics.
- The report provides valuable insights for educators, researchers, and enthusiasts interested in the practical applications of Pascal's Law.