

**SOME EXPERIMENTS AND DEMONSTRATIONS IN
INTRODUCTORY FLUID DYNAMICS**

A PROJECT REPORT PRESENTED BY

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Lift and drag forces are prominent on objects moving in air. Experiments are rare in physics texts on these. Variation of lift and drag forces on an air foil with the angle of attack was measured using a "force measuring balance" invented by the author. Results reveal that the lift force is a maximum at 30° . According to the above result the best angle of an airplane wing at the taking off position is 30° with horizon. A theoretical proof also was built for the above result. Drag force was less below 20° and rapidly increasing between 20° and 30° .

Other experiments designed to check the applications of above results were really congruent. A propeller was made with the facility to adjust the angle of the blades by 10° . Using the same power source the thrust produced by the propeller was measured and was a maximum at 30° . This concludes any propeller as well as a helicopter produces the maximum thrust when the blades are angled at 30° with the plane of rotation. This thrust is on air and as a result air will be blown out having maximum rate at 30° . Measured power output of a model windmill was greatest when angle of attack is 22° , showing the drag force is prominent now as well as the lift. When the flow is streamline, water outlet of a tap grows lean as it falls due to gravitational acceleration (g) and equation of continuity. Measured " g " by taking necessary readings gave a fair value.

Demonstrations are effective in visualizing the concepts and arousing student's interest. Devices made in this project were efficient in demonstrating applications of fluid dynamics. Applications of physics concepts and principles are seen everywhere around us. If teachers emphasize this, the students will be interested in physics. In this project all demonstrations visualize applications of fluid dynamics. Under discussions of all experiments applications are included. Some more are named or briefly discussed. All demonstrations and experiments included here are done with low cost, easily available or discarded things. So, all these can easily be carried out in all schools.