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**OSCILLATIONS AND WAVES EXPERIMENTS USING
LOW COST MATERIALS AND AVAILABLE
INSTRUMENTS IN THE SCHOOL LABORATORY**

A PROJECT REPORT PRESENTED BY

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The fundamentals of Physics are mainly based on experiments. However, owing to the great deal of time required for assembling and handling the experiments and preparing the relevant worksheets in the midst of availability of equipment in schools and necessity of covering the vast syllabus of Physics at General Certificate Examination (Advanced Level), teachers do not readily incorporate the experimental strategies in their classroom work. This condition is capable of providing only a vague idea about the concepts of physics and it has given unfavorable effects on the achievements of the students in Physics.

With this background, a project was carried out to teach the main concepts of the unit Oscillations and Waves in the General Certificate Examination (Advanced Level) Physics syllabus using demonstration experiments. A questionnaire was used to identify views, attitudes and opinions of a sample of teachers. The teachers highlighted the common problems of the teaching and learning process of the unit. From the teachers view, a set of concepts/ sub topics were selected and instruments were designed.

Then inexpensive materials and the other available resources in the school laboratory were used in designing instruments. The designed instruments can be used to obtain the wave patterns of the simple harmonic motion and damped harmonic motion, to demonstrate the relation between the circular motion and the harmonic motion, to introduce the wave properties, to demonstrate the particle movement in a media when a wave is propagating and to teach the concepts related to resonance. A motor driven bob-spring system was constructed to demonstrate the natural frequency of a spring. And the resonance was studied by obtaining amplitude

verses frequency curves for different bob masses. The resonance amplitude was studied under different frequencies and damping conditions. The Ripple tank designed to use with the OHP to demonstrate the wave fronts to a large class, was found to be more useful instrument than the ordinary one. The obtained results were in good agreement with the theory.

Worksheets for experiments related to the G.C.E (Advanced Level) Physics syllabus were designed to increase the effectiveness of the experiments. These instruments could be used even in school laboratories or other institutions with minimum financial resources to teach the concepts of Oscillations and Waves.