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## Increasing Realism in the Physics Laboratory

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## INCREASING REALISM IN THE PHYSICS LABORATORY

ROGER M. MORROW

At Iowa Wesleyan College we have felt the need of making the physics laboratory more interesting to the student. This has been accomplished, in part, by making the experiments such that the application is direct or obvious. The following four experiments meet our need.

The student determines the mechanical advantage of the transmission and differential of a car. Actual auto parts are used. Here the student sees for himself how the machine operates. Determination of the mechanical advantage of the differential with one axle held stationary, brings in the spider gear with movable axis. It is a new and interesting point for most students.

The experiment on the coefficient of friction is carried out on a large composition board using a model car (a dollar toy) with rubber wheels. The following list of suggestions is given to the student. Determine the coefficient of friction for the given conditions: (1) four wheels locked, (2) four wheels locked and with additional load, (3) four wheels locked, slide the car sideways, (4) two wheels locked, (5) incline plane method, (6) with car on sidewalk or concrete roadway. In addition the student may demonstrate skids and calculate some stopping distances. This experiment is judged successful because, (1) apparent student interest while performing the experiment, (2) many follow up this experiment by road tests of car brakes, (3) stated student preference for this experiment.

The experiment in sound is computing the period of reverberation of a large room and calculating the amount of material necessary to correct its defects. For this purpose the student is given a booklet from the Celotex Corporation and told to follow the instructions given there. The chief purpose of this experiment is to develop a consciousness of the acoustics problem and a realization that an intelligent person can do something about it.

The last experiment to be discussed is on photography. This has developed to meet the needs of the student having had no contact with photography and also to supplement the knowledge of

the amateur photographer that has had no opportunity to develop a film or print. The student is supplied with a Univex (39¢) camera and a roll of films (10¢). The student exposes the film. In the dark room he is given a minimum of instruction by which he can develop, fix, wash the film and print the pictures. The student finds this a new and worth while experience.

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