



LOYOLA
UNIVERSITY MARYLAND

GENERAL PHYSICS MODULE

MECHANICAL ENERGY

ABSTRACT

This document represents a lesson plan to introduce the idea of innovation to students in their introductory physics class, using basic ideas of mechanical work and energy conservation.

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Mechanical Energy Lesson Plan

Lesson Description

Overview: This module uses the ideas of mechanical work and conservation of energy to address feasibility questions of using human power to pump water for irrigation. It introduces students to the basic idea of innovation and entrepreneurship and can be used to “market” other opportunities at the institution.

Need: Students need to understand that basic concepts of physics have applications to real-world problems. Even at an introductory level, there may be problems that can be solved by creative applications of physics.

Goals: Students should be able to use physics knowledge to address feasibility questions for real-world problems.

Topics and Concepts: Energy Conservation; Finding approximate, real-world numerical values.

Length of the Module: This lesson can be run in approximately half an hour. Since it provides examples of energy conservation, similar to textbook problems, it should not add significantly to the time required to cover these topics.

Instructional Strategies: Power Point slides; Webcast will be available shortly. Additional problems are provided that can be assigned.

Target Audience

This module is designed primarily for students in an introductory physics course when they are studying energy conservation.

Prerequisites

Basic understanding of work, power and gravitational potential energy.

Learning Objectives

At the completion of this module students should be able to:

- Work with relationships between work, energy and power,
- Find approximate numerical values for real-world quantities,
- Address feasibility questions at a “first-order” level,

Evaluation

The learner / participants will demonstrate their level of learning by completing some additional homework assignments.



Materials and Resources

List the tools and resources that are used by the instructor and learner to conduct and complete the lesson.

- **Instructor Resources:** PowerPoint Slides, lesson plan with notes.
- **Learner Resources:** Webcast version of classroom presentation, articles, homework exercises.



Lesson Plan Outline

Estimated Time: Estimated time it will take to complete the lesson

Learning Objective	Activities/ Learning Method	Instructional Materials	Estimated Time
<i>Identify the learning objective</i>	<i>Describe the instructional strategy</i>	<i>Identify the materials that will be used by the instructor and learner</i>	<i>Time required to complete activity</i>
Work with relationships between work, energy and power	Encourage students to work through example problem as it is presented in PowerPoint.	PowerPoint slides	10 min
Find approximate numerical values for real-world quantities	Have students hunt down numerical values on the web.	PowerPoint slides	10 min
Address feasibility questions at a “first-order” level	Homework exercises	Homework exercises	30 min outside of class