

**Exploring Mechanisms**

**Introduction:**

The Exploring Mechanisms module introduces the scientific concepts and components that make machines work. Students also learn about careers in mechanical systems, construction, and manufacturing, where they can expand and apply the knowledge gained in this module.

**Module Details:**

This module teaches students how the principles of work, power, force, energy and torque are applied in various types of mechanisms. Several hands-on experiments demonstrate how these factors make it possible to perform simple functions, like opening doors, to complex tasks, like moving boulders and houses. Students also construct simple machines with gear trains, timing belt chains, O-ring chains, pulleys, and other devices. These activities allow them to learn first-hand how mechanical advantage is achieved with these mechanisms.

**Module Hints:**

- Take notes on module lessons, and use them on module lessons quizzes and post tests.
- Retake anything that you get a bad grade on!!!

**Module Grades:**

1. Pretest: Students will receive a 100 for taking the pretest.
2. Workbook grades are taken from the average of lesson quizzes.
3. Post Test use notes to take post tests. Post test maybe retaken.
4. Module Report: needs to be completed before module will be graded

GRADE DESCRIPTION	%
<b><u>Pretest Score:</u></b>	
<b><u>Work Book Assignments</u></b>	
Intro to Mechanical Power	
Inclined Plane and Wedge	
Lever	
Types of Levers	
Wheel and Axle	
The Pulley	
The Screw and the Gear	
<b><u>Work Book Score:</u></b>	
<b><u>Post Test Score:</u></b>	

**Lesson 1 Introduction to Mechanical Power**

<b>Gravity</b>	
<b>Weight</b>	
<b>Physics</b>	
<b>Work</b>	
<b>Effort</b>	
<b>Units of Work</b>	
<b>Kinetic Energy</b>	
<b>Potential Energy</b>	
<b>Thermal Energy</b>	
<b>Foot-pounds</b>	

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**Exploring Mechanisms**

<b>Joules</b>	
<b>Mechanical Advantage</b>	
<b>1869</b>	
<b>1300</b>	
<b>1808</b>	
<b>80-71 BC</b>	
<b>1841</b>	

**Lesson 2 Inclined Plane and Wedge**

<b>Inclined Plane</b>	
<b>Right Triangle</b>	
<b>Vertical Leg</b>	
<b>Mechanical advantage of the Inclined plane</b>	
<b>Friction</b>	
<b>Wedge</b>	
<b>Mechanical advantage of the wedge</b>	

**Lesson 3 Lever**

**Lesson Hotspots: Take notes on these items.**

<b>Lever</b>	
<b>Fulcrum</b>	
<b>Load</b>	
<b>Lever Law</b>	

**Lesson 4 Types of Levers**

**Lesson Hotspots: Take notes on these items.**

<b>1<sup>st</sup> Class Lever</b>	
<b>2<sup>nd</sup> Class Lever</b>	
<b>3<sup>rd</sup> Class Lever</b>	

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**Lesson 5 Wheel and Axle**

**Lesson Hotspots: Take notes on these items.**

<b>Wheel</b>	
<b>Axle</b>	
<b>Radius</b>	
<b>Diameter</b>	
<b>Mechanical Advantage of the wheel and Axle</b>	

**Lesson 6 The Pulley**

**Lesson Hotspots: Take notes on these items.**

<b>Pulley</b>	
<b>Fixed Pulleys</b>	
<b>Movable Pulleys</b>	
<b>Block and Tackle</b>	
<b>Mechanical Advantage of a Pulley</b>	

**Lesson 7 The Screw and the Gear**

**Lesson Hotspots: Take notes on these items.**

<b>Screw</b>	
<b>Gear</b>	
<b>Gear Train</b>	
<b>External Gear</b>	
<b>Internal Gear</b>	
<b>Spur Gear</b>	
<b>Bevel Gear</b>	
<b>Worm Gear</b>	
<b>Rack and Pinion Gears</b>	
<b>Differential</b>	
<b>Pinion (Driving) Gear</b>	
<b>Driven Gear</b>	
<b>Idler (transfer) gear</b>	

**Name:** \_\_\_\_\_ **Block:** \_\_\_\_\_ **Date:** \_\_\_\_\_

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