

08 Levers and Linkages

Content Area: **Technology**
Course(s):
Time Period: **Full Year**
Length: **4 Week**
Status: **Published**

General Overview, Course Description or Course Philosophy

This full-year course continues to emphasize the application of integrated STEM (Science, Technology, Engineering and Mathematics) principles and the design method introduced in the 1st year technology course. This course is taught on the foundations of technology education having students invent solutions to real-world problems through robotic applications. Students will identify problems, research, design and fabricate solutions. Problem solving, critical thinking and design skills are taught through various activities. Hands-on themes include structural and robotic systems, as well as system control technology. This course provides all students with valuable skills such as: problem solving, design, creative thinking, systems thinking, teamwork, documentation, programming, and computer applications.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Simple machines and basic mechanisms make life easier.

You can't cheat work.

CONTENT AREA STANDARDS

TECH.8.2.12.D.3	Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.
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RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
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STUDENT LEARNING TARGETS

Students will understand:

- How levers are used to increase power in a technological system.
- How linkages are used to change the direction of motion in a technological system.

- How to calculate mechanical advantage in levers.
- How to design and linkages to create different types of motion

Declarative Knowledge

Students will know:

- Identify different types of linkages and how they change motion.
- Explain how to change motion in linkages.
- Recognize the difference between fixed and moveable joints.

Procedural Knowledge

Students will be able to:

- Demonstrate the ability to design, build and apply levers/linkages in a system to increase or decrease mechanical advantage and to change motion.
- Calculate the mechanical advantage when using levers.

EVIDENCE OF LEARNING

Formative Assessments

Observation of “Do Now”

mechanical advantage problems during and after lessons.

Observation of hands on linkage project.

Linkage problem solving assignment (hands on).

Quiz on Mechanical Advantage in levers.

Summative Assessments

Engineering log - Linkages.

RESOURCES (Instructional, Supplemental, Intervention Materials)

Teacher notes on Engineering Logs.

Former student log examples.

Panasonic Challenge Engineering Log notes and examples.

INTERDISCIPLINARY CONNECTIONS

Educational Technology: Use of Google resources

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.