



Search

COUNSELORS | PARENTS | STUDENTS | TEACHERS

Life of an Engineer | Become an Engineer | Find a University | Lesson Plans | Ask an Expert | Play Games

Discover the creative engineer in you

Lesson Plans

Lesson Plan Survey

TryEngineering Home > Lesson Plans > Lesson Plan Detail

Heart of the Matter

Download Full Lesson Plan

(Full teacher resource documents are included)

Lesson Focus

Lesson focuses on the engineering and operation of artificial heart valves, and the interface between man and machine.

Lesson Synopsis

The Heart of the Matter activity explores the concept of valve operation and how engineering adapted valves for use in mechanical heart valve design. Students learn about several different valves used at home and in industry, and three different mechanical heart valve designs. Students examine and operate both a ball valve and a experiment with a gate valve, then they work as a team of "engineers" to develop and sketch enhancements to the mechanical heart valve.

Age Levels: 8-18

Objectives

- Learn about valves.
- Learn about engineering design changes to mechanical heart valves
- Learn about human/machine interface to meet human needs.
- Learn about teamwork and the engineering problem solving/design process.

Anticipated Learner Outcomes

As a result of this activity, students should develop an understanding of:

- valves



- mechanical - human interface
- impact of engineering and technology on society
- engineering problem solving
- teamwork

Lesson Activities

Students learn about how valves operate and the engineering enhancements that have improved mechanical heart valve design over time. Topics examined include problem solving, teamwork, and the engineering design process. Students work in teams to examine and operate two types of valves, then recommend changes to improve the functionality of mechanical heart valves. Student teams sketch their new designs and present to the class.

Resources/Materials

- Teacher Resource Documents (attached)
- Student Resource Sheets (attached)
- Student Worksheet (attached)

Alignment to Curriculum Frameworks

Curriculum alignment sheet is included in [PDF](#).

[Take Survey](#)