DESCRIBING SYSTEMS
Teaching Guidelines

Summary: Students learn how to describe a designed system through discussion and teamwork.

Subject: Engineering

Topics: Systems

Grades: 9 - 12

Concepts

- System
- Purpose
- Input/Output

- Process
- Control

Procedure

Prepare for presentation the Futures Channel movie, *Designing and Engineering Rockets*. Tell students that they will be watching a movie about rockets, and that, as they watch, you want them to think about this question:

What is a system?

Play the movie, *Designing and Engineering Rockets*, all the way through. Accept and discuss some answers to the prompt, then distribute the handout and use it as the basis of a class discussion about the characteristics of designed systems.

Have students work in teams to describe, in detail, a system that they are familiar with. The description should include the parts of the system, its purpose, and a discussion of the inputs and outputs, processes, and controls.

Note: You may wish to also have students describe the interactions of system components, if it is important that they understand the details systems they are describing. This activity can also be made more formal by the use of a rubric for the description.

Describing Systems

A system is a collection of parts that interact with each other.

Some systems are natural. A forest is an example of a natural system.

Some systems are designed by people. A computer is an example of a designed system.

All designed systems have four characteristics: purpose, input/output, processes, and controls.

Purpose is the reason the system is created. The purpose of a system is what it is supposed to do. What do you think is the purpose of a computer system?

Input/Output is what goes into a system, and what comes out. What goes into a computer system? What comes out?

A *process* is a way that the system operates in order to accomplish its purpose. For example, a computer has a process that causes the letters that you type on a keyboard to show up on the display. What are some other processes in a computer?

Controls allow people to turn the system on and off, and to cause it to carry out certain processes. How do you control a computer?

To describe a system, you would show or state the parts of the system, the purpose, the input/output, the processes, and the controls.

Think of a system that you are familiar with. Describe it in as much detail as you can.