Engineering

Modeling a System

Identify the System

Whether you think about it or not, you interact with systems every day. A school, a classroom, or an athletic team could be modeled as a system. In this activity, you will model a system that you are familiar with, and then use your model to suggest improvements to that system. You can choose one of the following school-related systems or come up with one of your own:

- getting food in the cafeteria
- visitors checking in at the front office
- students getting on buses to go home
- cars leaving the parking lot when school is over

You may work on your system model on your own or in collaboration with one or more students.

Make a Model

Make a model of the system you have chosen. Your model should illustrate the following:

- the components of the system
- how the components interact
- the inputs and outputs of the system
- the system boundaries
- system controls and feedback loops

Identify a Problem

Identify a problem with this system for which you could suggest solutions. For example, is there congestion in this system when too many people try to get to a location at the same time?

Suggest a Solution

Brainstorm some solutions to this problem. How could the efficiency of this system be improved in terms of the following items?

- time
- costs
- materials
- inputs and outputs

FIGURE 13: Your school cafeteria can be modeled as a system.

Consider Tradeoffs

Choose one of the solutions you suggested, and answer this question: How would this proposed solution affect the other parts of the system?

Are there any social, cultural, or environmental impacts of your solution? Explain your answer.

Revise the Model

Revise your original model to show how the solution you suggested would be integrated into the system.

Language Arts Connection Prepare a multimedia presentation to persuade people to implement your solution. A multimedia presentation should use graphics, text, music, video, and sound. Include your final model, an explanation of the solution you are proposing, and a discussion of tradeoffs you considered.

VIRUSES: ARE THEY ALIVE? LIFE UNDER A MICROSCOPE Go online to choose one of these other paths.