The Journey Inside^{SM}: Microprocessors
Student Handout: High-Tech Sandwiches

High-Tech Sandwiches

Sometimes you do things automatically with little thought as to how you do them. Think about how you learned to ride a bicycle or how you learned to walk. You might have difficulty in recalling exactly what you did as you learned. Now you do both those things easily. Another task you might find quite easy is recognizing voices over the telephone or immediately associating a smell with some event that you remember. All these things would be difficult for a computer to do.

It is not that a computer could not be programmed to do difficult things. For example, the greatest human chess player in the world was defeated by a computer programmed to play chess. The game of chess involves complex problem solving. To be successful requires an awareness of the impact an immediate decision will have several steps later in the game.

Computer programmers were finally able to represent the decision-making steps of chess in a way that let a computer decide each move in a short amount of time. For a person, testing possible results of selected moves is difficult and time consuming. For a computer, this type of decision making is much easier.

You do many things each day without stopping to identify each step. You can dress without thinking about each move. You can walk from the front door of the school to your classroom with no difficulty. You can even make sandwiches. Or can you?

Activity

You are the owner of a new robot. Your robot hasn't learned to do anything very useful yet and it is still very new to the world. Your robot will be of human size and shape. Your robot only understands a small set of instructions and, of course, isn't able to think for itself. You will need to teach the robot to do the things you expect it to do.

Develop a set of instructions so your robot can follow the necessary steps to successfully make a peanut butter and jelly sandwich. Start by deciding what instructions you might need. Keep the list short and simple. Think of your robot as a very small child. Examples of the instructions in your "robot language" might include statements such as: open hand, close hand, grasp object, and scoop.

Your set of sandwich-making directions needs to be clear, concise, and readable by someone other than yourself. Keep the directions organized.