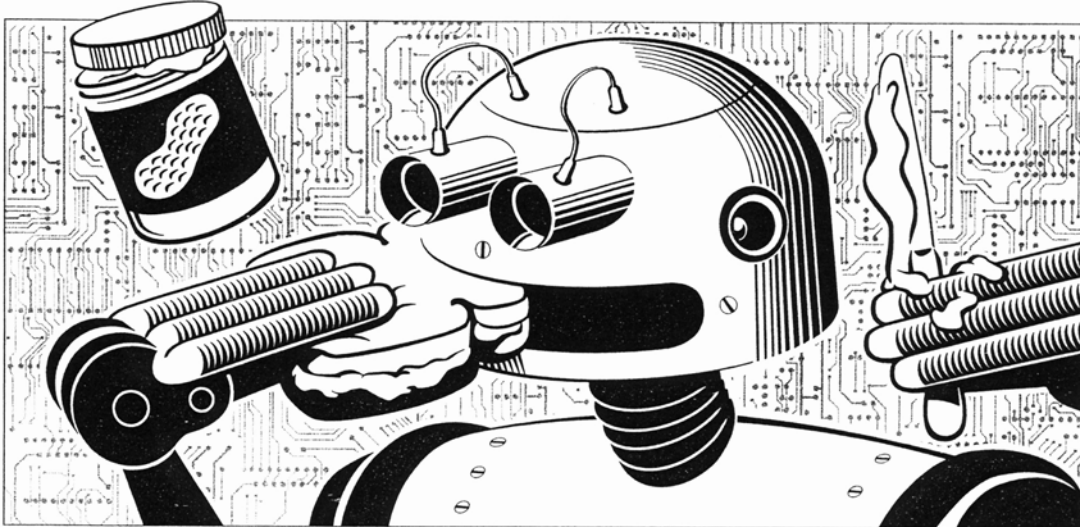


The Microprocessor: Peanut Butter & Jelly Activity



Goal

Students will understand that the microprocessor follows a precise set of instructions.

Microprocessors do very complex tasks by breaking them down into simple steps.

Microprocessors are often called the brain of the computer, but they are very different from a human brain.

Activity

Students will create a precise set of instructions to make a peanut butter and jelly sandwich.

Many people refer to the microprocessor as the "brain" of the computer. You may sometimes hear it called a Central Processing Unit or CPU. Like your brain, it is the central place where information is processed and it tells the other parts of the computer what to do by taking input and directing output. It is very different from a human brain because it does not think for itself; it only does what it is told to do.

Grade Level

Grades 4-8

For higher grade levels, use a more complicated task such as putting on a coat, tying your shoe.

Every job a microprocessor does is broken down into a set of separate little operations with a coded instruction for each task. This list of instructions is called a program. You can program microprocessors to perform certain tasks for different situations. Unlike our brains, microprocessors do not think. Therefore the instructions, or program, given to a microprocessor must be very precise.

Key Concepts

The microprocessor is the Central Processing Unit for the computer. It controls what the computer does.

Microprocessors follow a precise set of instructions called a program

Lesson

Materials

A sample microprocessor or picture of one to show the class
Chalk and chalkboard or white board with pens or flip chart and pens
Peanut butter, jelly and several slices of bread, dull or plastic knife and a spoon



Directions

Note: This is intended to be a fun activity with lots of student interaction. Do not feel shy about "hamming" up the directions.

1. Tell the class that they are going to write instructions to program a microprocessor that controls a robot. The program will be a set of instructions for making a peanut butter and jelly sandwich. On the front table there are pieces of bread, an open jar of peanut

butter and an open jar jelly. There is also a knife and a spoon.

2. You will be the robot.

3. Ask the students to think about how to make a PBJ sandwich and how they would write the program. Students then write the program. 40 minute version-Students work in small groups to prepare their program. Each group submits one set of instructions. 25 minute version-Ask the students for the first instruction, second and so on. Write the instructions on the board. After the first four or five instructions tell the class you will now try the first few.

4. Follow the instructions exactly. The instructions will be unclear and steps will be missing (like using a knife or the bread). If the instruction says "put the peanut butter on the bread" you might put the jar of peanut butter on the bread. Ask the students what is wrong? They will quickly see that the instructions were not specific enough or possibly whole steps were omitted.

5. Once the class understands that more precise instructions are needed, have the students "de-bug" the program again and then summarize the lesson by reviewing the following: Microprocessors can perform complex tasks when given a precise set of instructions that break that task down into simple steps. The microprocessors can be programmed to handle different situations but, unlike a human brain, the microprocessor cannot make decisions. Therefore the instructions or program must be very exact.

This activity is adapted from Intel Corporation's *The Journey Inside: the Computer Education Kit*.

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