A COMPUTER

The word "computer" has been part of the English language since 1646, but if you look in a dictionary printed before 1940, you might be surprised to find a computer defined as a *person* who performs calculations! Prior to 1940, machines designed to perform calculations were referred to as calculators and tabulators, not computers. The modern definition and use of the term "computer" *emerged* in the 1940s, when the first electronic computing devices were developed.

Most people can formulate a mental picture of a computer, but computers do so many things and come in such a *variety* of shapes and sizes that it might seem difficult to distill their common characteristics into an all-*purpose* definition. At its core, a **computer** is a *device* that *accepts* input, *processes* data, *stores* data, and produces output, all according to a series of stored instructions.

Computer **input** is whatever is typed, *submitted*, or transmitted to a computer system. Input can be *supplied* by a person, the environment, or another computer. Examples of the kinds of input that a computer can accept include words and symbols in a document, numbers for a calculation, pictures, temperatures from a thermostat, audio signals from a microphone, and instructions from a computer program. An input device, such as a keyboard or mouse, gathers input and *transforms* it into a series of electronic signals for the computer to store and manipulate.

In the context of computing **data** refers to the symbols that represent facts, objects, and ideas. Computers manipulate data in many ways, and this manipulation is called **processing**. The series of instructions that tell a computer how to *carry out* processing tasks *is referred to as* a **computer program**, or simply a "program". These programs form the **software** that *sets up* a computer to do a specific task. Some of the ways that a computer can process data include *performing* calculations, sorting lists of words or numbers, modifying documents and pictures, *keeping track* of your score in a fact-action game, and drawing graphs. In a computer, most processing takes place in a component called the **central processing unit** (CPU), which is sometimes described as the computer's "brain".

A computer stores data so that it will be *available* for processing. Most computers have more than one place to put data, depending on how the data is being used. **Memory** is an area of a computer that *temporarily* holds data waiting to be processed, stored, or output. **Storage** is the area where data can be left on a *permanent* basis when it is not immediately needed for processing. **Output** is the result produced by a computer. Some examples of computer output include reports, documents, music, graphs, and pictures. An output device displays, prints, or *transmits* the results of processing.

Take a moment to think about the way you use a simple handheld calculator to balance your checkbook each month. You're forced to do the calculations in stages. *Although* you can *store* data from one stage and use it in the next stage, you cannot store the sequence of formulas – the program – required to balance your checkbook. Every month, therefore, you have to perform a similar set of calculations. The process would be much simpler if your calculator remembered the sequence of calculations and just asked you for this month's checkbook entries.

Early "computer" were really no more than calculating devices, designed to carry out a specific mathematical task. To use one of these devices for a different task, it was necessary to rewire its circuits – a job best left to an engineer. In a modern computer, the idea of a **stored program** *means* that a series of instructions for a computing task can be *loaded* into a computer's memory. These instructions can easily be replaced by a different set of instructions when it is time for the computer to perform another task.

The stored program concept *allows* you to use your computer for one task, such as *word processing*, and then easily *switch* to a different type of computing task, such as *editing* a photo or sending an e-mail message. It is the single most important characteristic that *distinguishes* a computer from other simpler and less *versatile* devices, such as calculators and pocket-sized electronic dictionaries.