Chapter 9
Building a Computer

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ABSTRACT

This chapter describes the reasons and the task of building a computer, which might provide students with the understanding of the structure and functions involved in computing. The process of planning, acquiring, and building a computer is discussed as a cognitive way of learning and sharing information. This project was funded by the Art Director at the University of Northern Colorado. The process of building the computer was done by Sean Flannery, a student in Computer graphics, and recorded by a camera operator. The footage was edited into a video by a Computer Graphics and Marketing student. The final video can be seen at the following URL: https://www.youtube.com/watch?v=m28186QIsqM.

INTRODUCTION: WHY TO BUILD A COMPUTER

There is still a big demand for powerful, costly computers consisting of a tower, with a fast processor connected to a big monitor, especially when it comes to developing professional projects in a growing number of domains, when the work should be performed in visual mode. Moreover, a task of building a computer might provide students with the understanding, a general look and an overview from the bird's-eye view on the whole structure and functions of electronic appliances (Figure 1). The process of searching for the working parts alone may support understanding computer architecture (Hennessy & Patterson, 2011; Patterson, & Hennessy, 2011).

Computers are continually becoming an integral part of daily life. They have changed the way people obtain and handle information, even effecting the way people think. Computers are used as teaching tools for people of all ages by offering information and ideas from all over the world. Computer generated visuals are widely used to convey knowledge and increase understanding of complex topics. As technology improves, computers will continue to become more accessible resulting in higher percentages of computer users.

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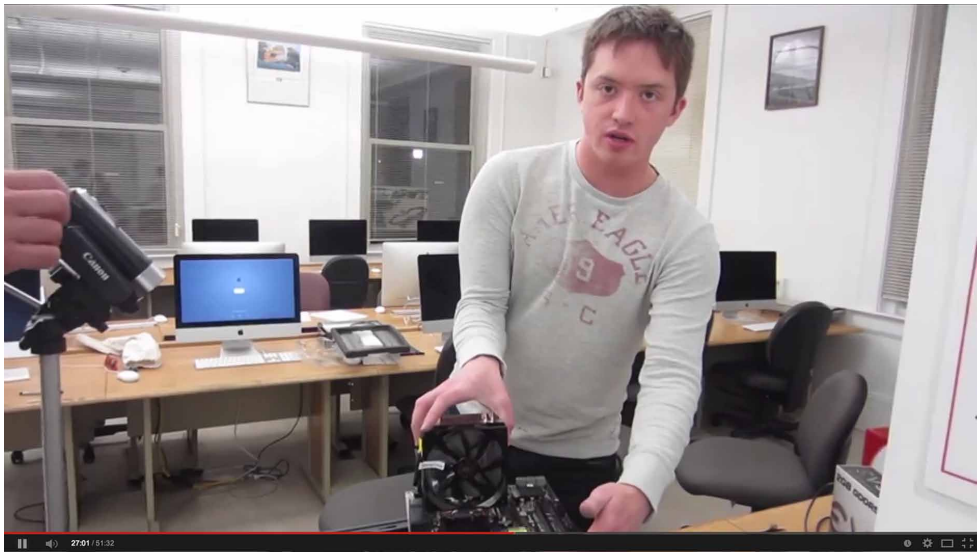
Figure 1. Sean Flannery building a computer (© 2014, Z. Britton. Used with permission)



While building a personal computer is becoming more popular, it is still a hassle in comparison to buying one at the store. However, the impact on daily life caused by computers has become more widely felt, causing the understanding of how the computer sitting on a person's desk works to be greatly beneficial.

HOW TO BUILD A COMPUTER

Collecting Necessary Components

The hardest part of building the computer is buying all of the individual components. There are a handful of different components, all with many options of different brands, and specifications. Determining the specific components will require a little research in order to find the best parts for the desired purpose of the computer. There are, however many websites (Build a computer guide, 2014) and books (Marshall, 2013; Morley & Parker, 2012) informing about the task. No matter the purpose of the individual computer, all computers require the same basic components.

- The Case/Tower is one of the first things that every computer requires. Towers come in many different shapes, colors, and designs. Since the case is what keeps the individual components together, the size will be dependent on what is going into the computer. The design of the case should also be considered.
- The Motherboard is the component that connects all of the separate units together to allow them to "talk" to each other. Choosing the correct motherboard for a specific function is important because it is home of many ports where all of the other components plug into.
- The Central Processing Unit (CPU) is essentially the "brain" of the computer. The CPU tells all of the other components what to do and helps determine the speed of the computer. The CPU performs this task by retrieving instructions from memory, and decoding it using the built in arithmetic/logical unit. The CPU then performs the action decoded from the instructions. Eventually, the result will be sent to one