

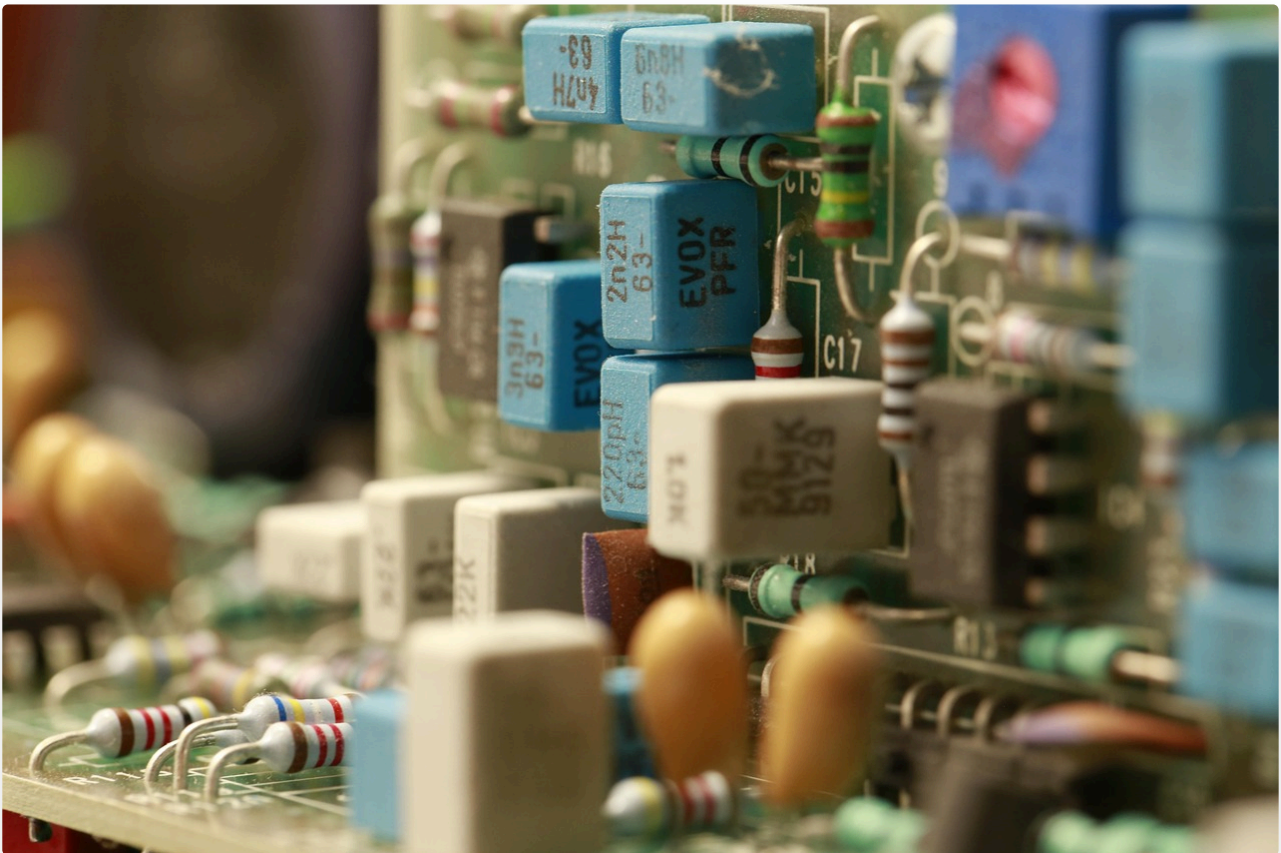
## Inside the Machines

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### Textbook

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## Inside the Machines



### Introduction

When you turn on a computer or open an app, you probably don't think much about how it works—but behind the scenes, both hardware and software are working together like a team. From the raw materials used to build computer parts to the step-by-step process of writing and maintaining code, a lot goes into the technology we use every day. This unit will help you understand how computers are made, how software is developed, and how everything stays working smoothly over time.

### Hardware and Software: A Powerful Team

Think of a computer like a robot. **Hardware** is the robot's body—its screen, keyboard, processor, and memory. **Software** is the instructions that tell the robot what to do. Without software, the hardware just sits there. And without hardware, software can't run. Key parts that connect hardware and software include things like the **BIOS (Basic Input/Output System)**, which helps the computer start up, and the **operating system (OS)**, like Windows, ChromeOS, or macOS, which helps you run apps, browse the web, and play games.

## What Computers Are Made Of

Computer hardware doesn't appear out of thin air—it's made from **natural resources** like metals, minerals, and plastics. For example, **copper** is used in wires, **silicon** is used in chips, and **lithium** is used in batteries. Mining and refining these materials has an environmental impact, and not all of them can be reused easily. Understanding where computer parts come from helps us think about how we can build and use technology more responsibly.

## How Software Gets Made: The Life Cycle

Creating software is like planning and building a school play. It goes through several steps, called the **software development life cycle**:

1. **Describe the project** – What should the software do?
2. **List the steps** – What needs to happen first, second, and so on?
3. **Take resources into account** – Who will write the code, and what tools are needed?
4. **Create a visual plan** – Like a flowchart or diagram of how the program will work.
5. **Write the code** – Use a programming language to build the software.
6. **Perform maintenance** – Make changes or updates when something breaks or needs to improve.

Each step helps make sure the final program works well for users.

## Why Software Needs Maintenance

Just like your bike needs oil or your apps need updates, **software needs maintenance** to keep working smoothly. After a program is finished, users may notice bugs, or the developers might want to add new features. Maintenance involves **modifying, improving, or fixing the code** to make the software better over time. Without it, even the best software can become outdated, slow, or unsafe.

## Questions (5)

### 1. What is the relationship between hardware and software?

MULTIPLE CHOICE

Choose the correct answer:

- A. They are completely separate and don't interact
- B. Hardware controls software without input
- C. Software tells hardware what to do so it can function
- D. Software is made out of hardware materials

MULTIPLE CHOICE

**2. Which of the following is a natural resource used in making computer hardware?**

**Choose the correct answer:**

- A. Styrofoam
- B. Silicon
- C. Cotton
- D. Gasoline

MULTIPLE CHOICE

**3. What is the first step in the software development life cycle?**

**Choose the correct answer:**

- A. Write the code
- B. Maintain the software
- C. Create a visual diagram
- D. Describe the project

MULTIPLE CHOICE

**4. Why is maintenance an important part of software development?**

**Choose the correct answer:**

- A. It makes the software easier to delete
- B. It ensures the software always looks new
- C. It helps fix bugs and add improvements over time
- D. It keeps the hardware from overheating

MULTIPLE CHOICE

**5. What does an operating system (OS) help users do?**

**Choose the correct answer:**

- A. Connect the computer to the Wi-Fi router
- B. Mine the materials for the computer
- C. Run programs and interact with hardware
- D. Manufacture computer parts

## Answer Keys & Solutions

### Questions

#### 1. What is the relationship between hardware and software?

MULTIPLE CHOICE

Correct Answer:

- A. They are completely separate and don't interact ✗ Incorrect
- B. Hardware controls software without input ✗ Incorrect
- C. Software tells hardware what to do so it can function ✓ Correct
- D. Software is made out of hardware materials ✗ Incorrect

#### 2. Which of the following is a natural resource used in making computer hardware?

MULTIPLE CHOICE

Correct Answer:

- A. Styrofoam ✗ Incorrect
- B. Silicon ✓ Correct
- C. Cotton ✗ Incorrect
- D. Gasoline ✗ Incorrect

#### 3. What is the first step in the software development life cycle?

MULTIPLE CHOICE

Correct Answer:

- A. Write the code ✗ Incorrect
- B. Maintain the software ✗ Incorrect
- C. Create a visual diagram ✗ Incorrect
- D. Describe the project ✓ Correct

#### 4. Why is maintenance an important part of software development?

MULTIPLE CHOICE

**Correct Answer:**

- A. It makes the software easier to delete ✗ Incorrect
- B. It ensures the software always looks new ✗ Incorrect
- C. It helps fix bugs and add improvements over time ✓ Correct
- D. It keeps the hardware from overheating ✗ Incorrect

#### 5. What does an operating system (OS) help users do?

MULTIPLE CHOICE

**Correct Answer:**

- A. Connect the computer to the Wi-Fi router ✗ Incorrect
- B. Mine the materials for the computer ✗ Incorrect
- C. Run programs and interact with hardware ✓ Correct
- D. Manufacture computer parts ✗ Incorrect