

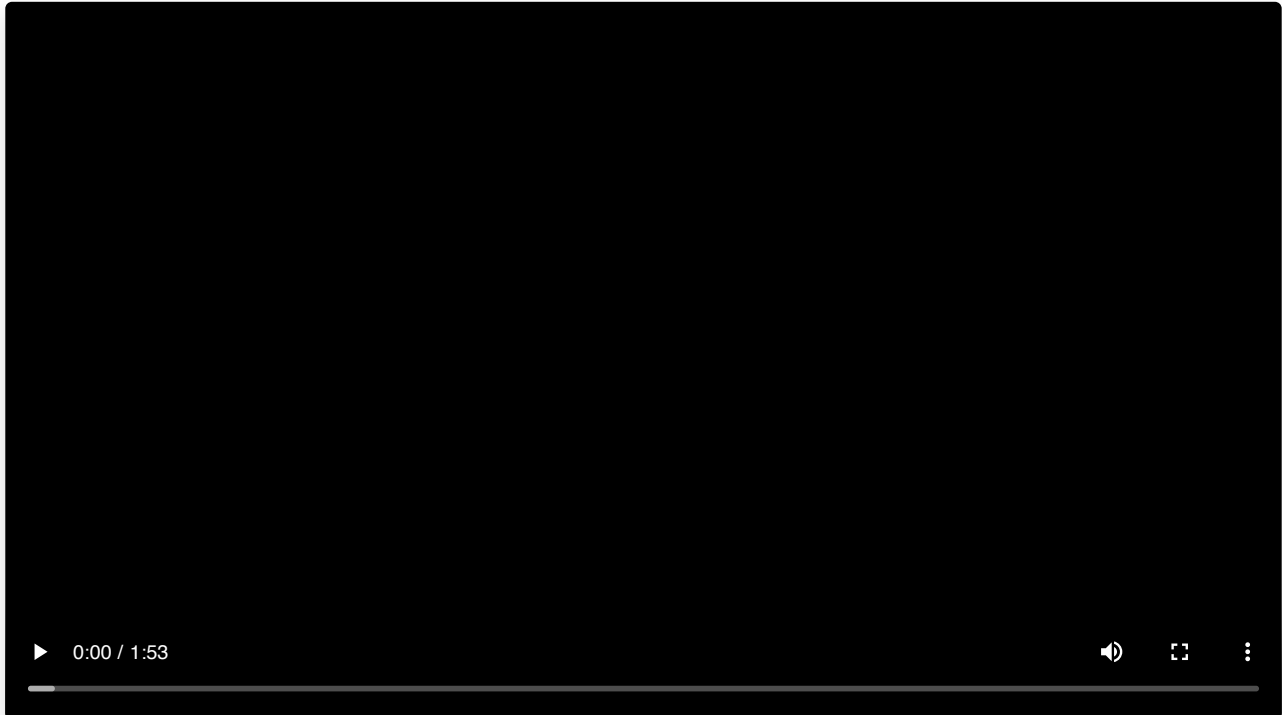
## Computer Parts and Pieces

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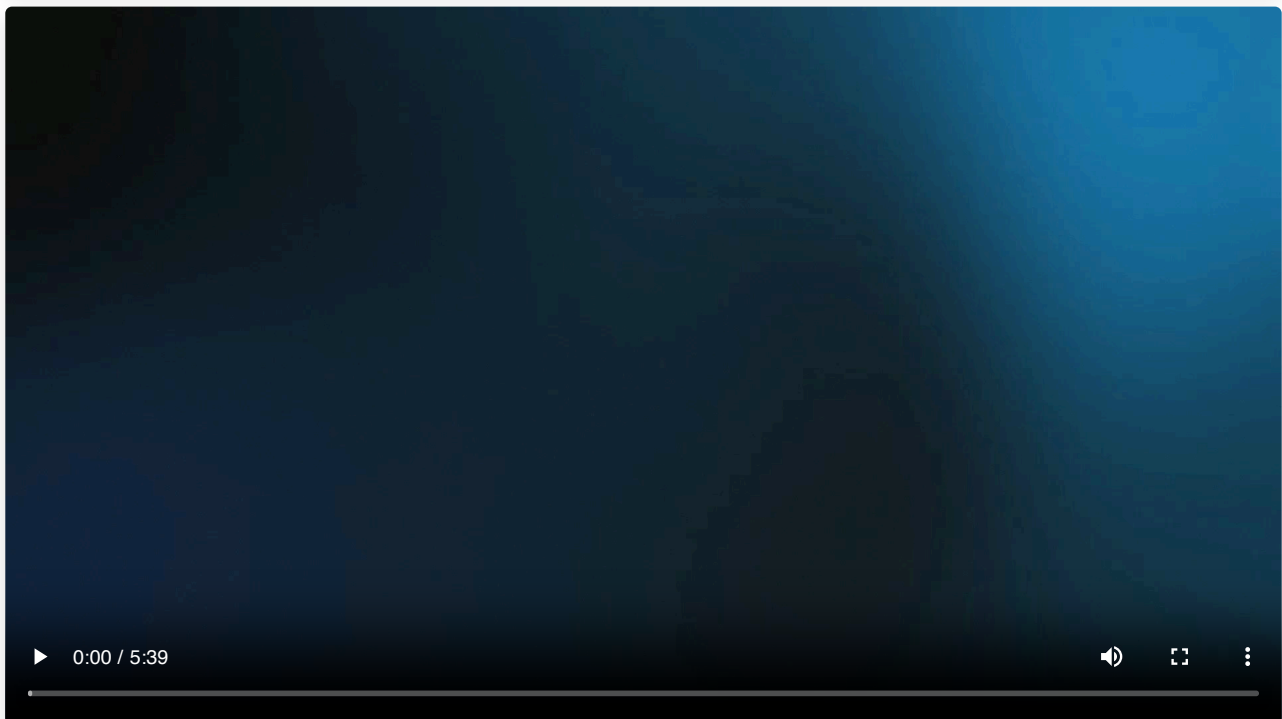
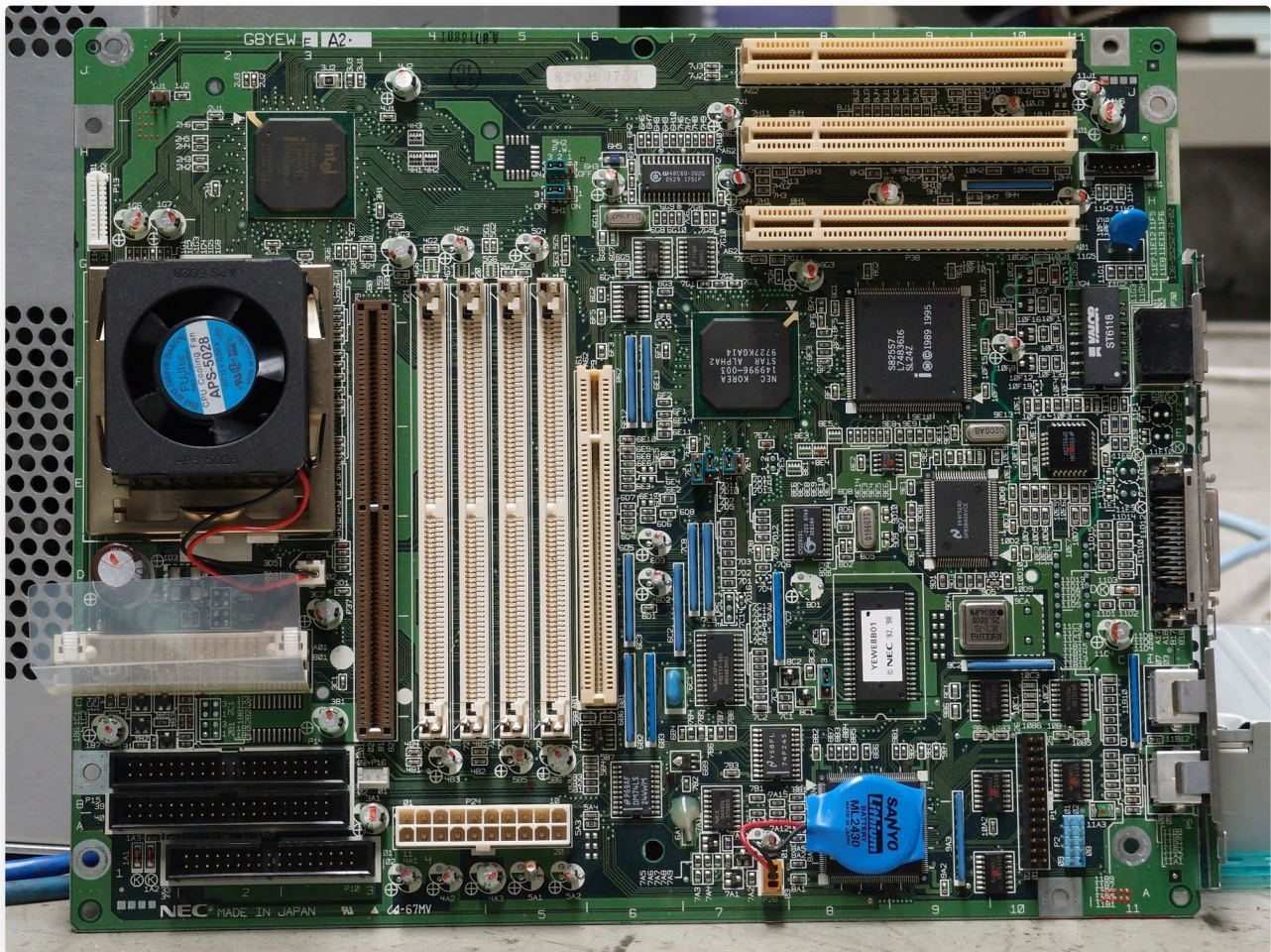
### Textbook

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## Computer Parts and Pieces







The human body is amazing. Many different processes work together for you to be able to function. Each part of the body works together to help you do what you need to do every day. Each part has a critical role to play that helps the body function normally.

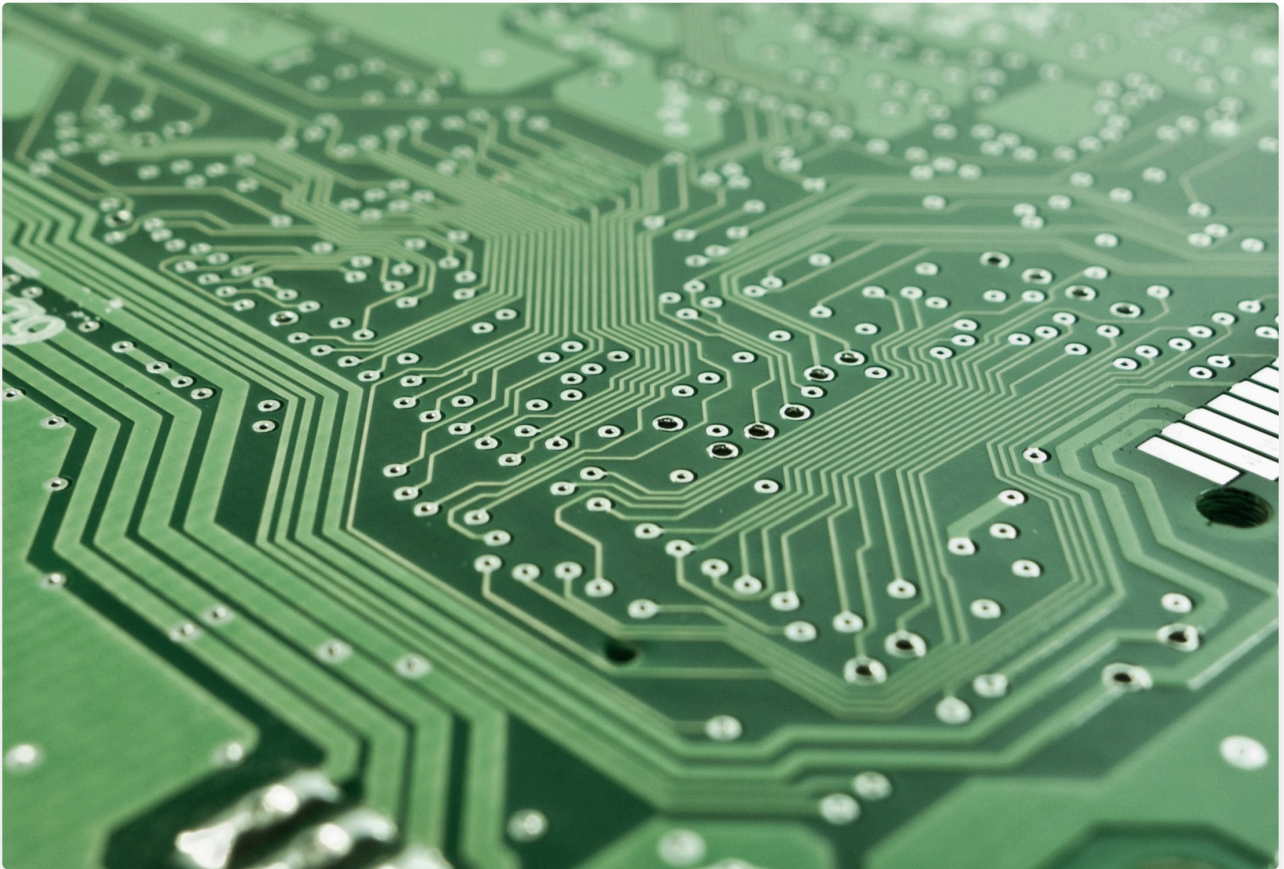
Computers are similar. Computers have many different processes that work together for the machine to run normally. Each part has an important role to play.

But what are these parts and how do they work together? Let's explore some of the most important parts of a computer.



This lesson will explore different pieces of [hardware](#). Computer hardware is the physical components that make up the computer.

## Motherboard



The [motherboard](#) is the basic structure that everything connects to. It's often green and has many chords and wires connected to it. The motherboard is like the backbone that holds everything in place.

Can you find the motherboard in the picture at the top of this lesson?



## Power Supply

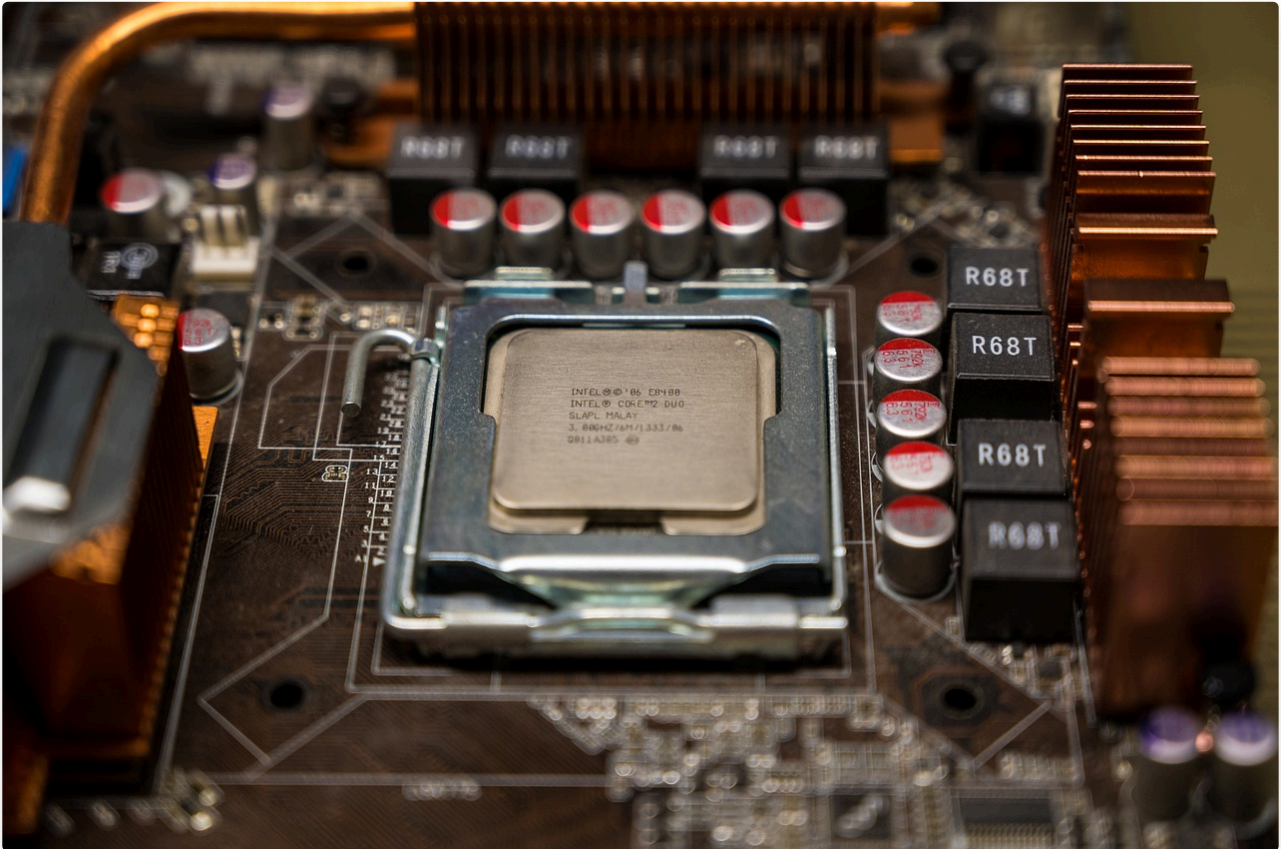


Computers need power to run, so a [power supply](#) is essential. The power supply is often connected to the motherboard so it can easily provide power to all the other components of the computer.

Can you find the power supply in the picture at the top of this lesson?



## CPU: Central Processing Unit



The [CPU](#) is the brain of the computer. It's often a small, one inch square. The CPU is responsible for the computational ability of a computer. Everything we are able to accomplish with computers is possible because of the CPU. The CPU processes billions of bits of information per second! This is how we create programs, perform calculations, transfer files, and everything else we do on a computer. These calculations generate HEAT--which is why we need cooling systems.

Can you find the CPU in the picture at the top of this lesson?



# Fan

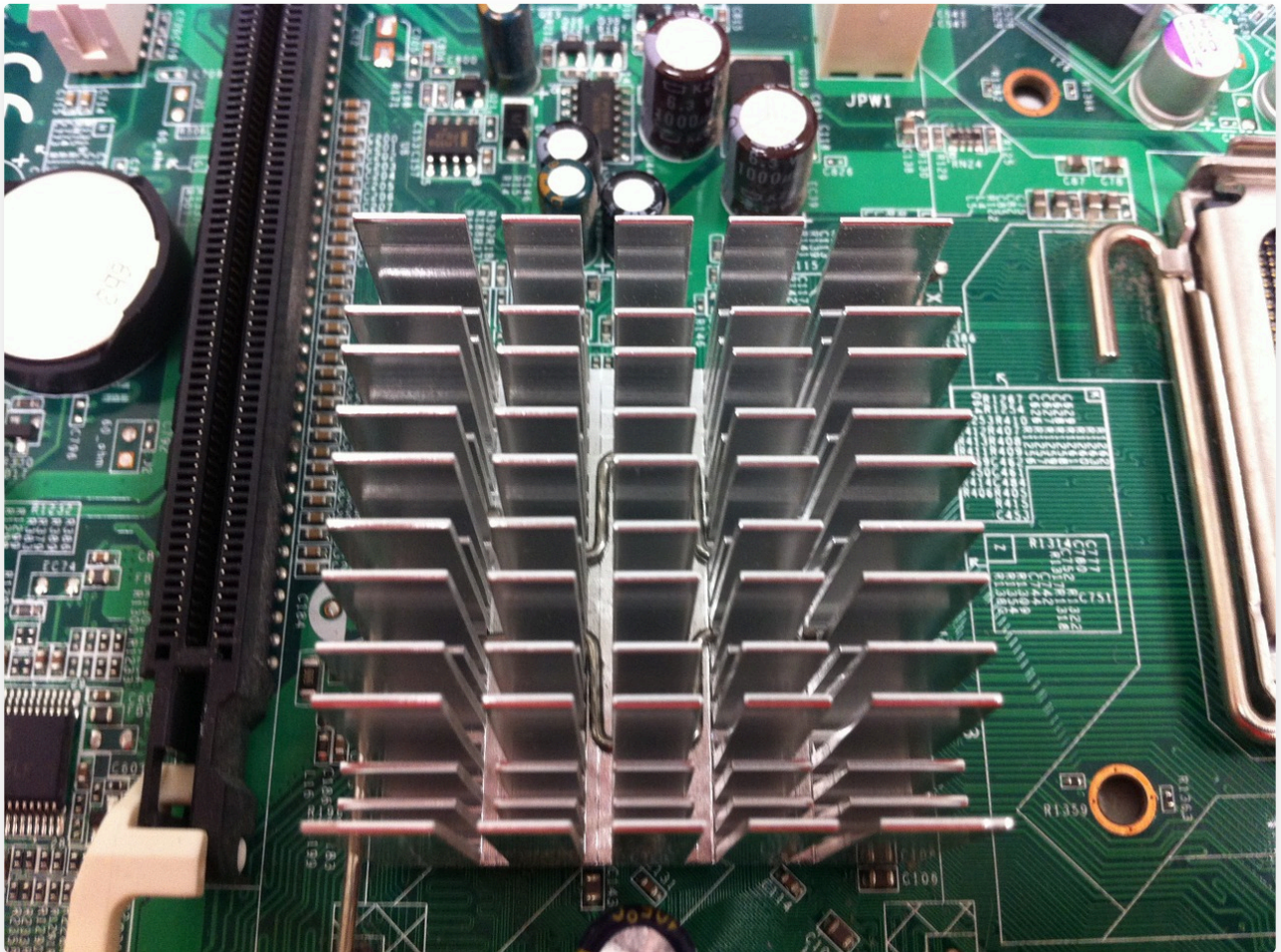


What do you do to cool off on a hot day? Sometimes you'll sit in front of a fan. The computer also uses a [fan](#) to cool off. One method we use to cool down the computer is a small fan. The fan is often found connected to the power supply.

Can you find the fan in the picture of the power supply and in the picture at the top of this lesson?



# Heat Sink



On a hot day, what sounds more comfortable: snuggling into a tight ball, or spreading out? Spreading out increases the surface area that heat can escape from, so the air cools us down more. Computers use a similar approach by using a [heat sink](#). The heat sink spreads out the computational pieces to allow more heat to escape.



# RAM: Random Access Memory



[RAM](#) is temporary memory. Things stored with ram are generally lost if the computer gets turned off. Have you ever been working on an assignment and forgotten to hit "Save" and then lost the whole thing when you turned off the computer? This is because the assignment is running on RAM while you are working on it, but it doesn't last if the machine gets turned off. RAM allows you to interact with the screen and navigate programs or apps. RAM takes the form of chips that are usually attached to the motherboard.

Can you find the RAM chips on the picture at the top of the lesson?

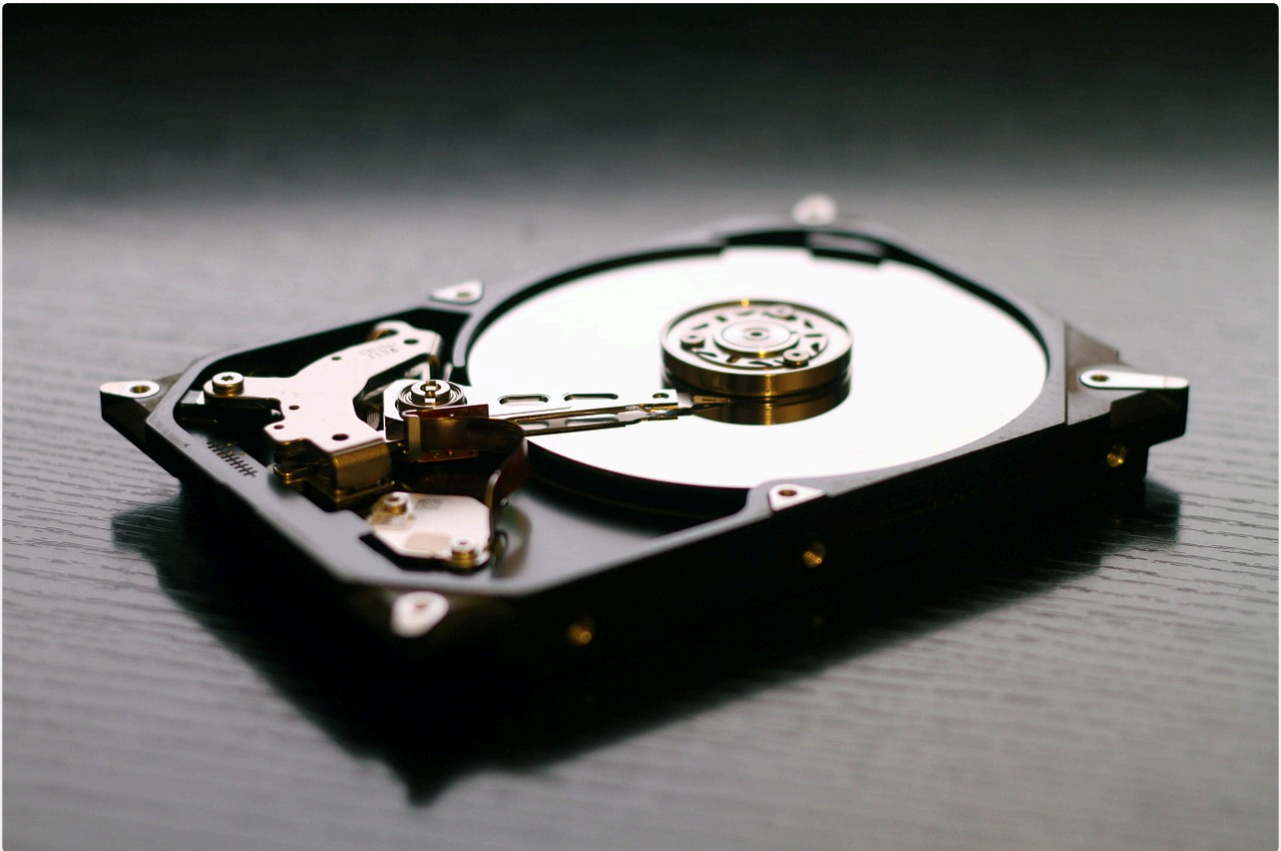
## ROM: Read Only Memory

[ROM](#) is long term memory. ROM allows you to store information like pictures, files, or profiles so that that information lasts even if the machine gets turned off.

You can think of RAM as more of the memory of the computer, while ROM is more like data storage.



## Storage



There are other forms of storage, such as a hard drive.

The hard drive has a spinning disk that data can be written to. Hard drives are popular because they are cheaper to make. The spinning disk is susceptible to get bumped off track, resulting in potential data loss.

Another form of storage are solid state drives, or SSDs. Solid state drives do not have a spinning disk and are a more reliable place to store your information.

## Abstraction

The plastic outside of the computers we normally use are an example of [abstraction](#). Abstraction is representing something more complex with something simpler. The user doesn't want to know how the [heat sink](#) works with the [CPU](#) and [power supply](#) on the [motherboard](#) in order to send an email. The user just wants to hit the "send" key and have it work. The outside of the computer abstracts all the inner workings of the computer to make an easier experience for the user.

## Inputs and Outputs

Computer parts are often categorized into input devices or output elements. An input element is something that brings information to the computer. The mouse, trackpad, keyboard, and microphone are examples of hardware input elements. They are often connected to the computer at certain ports on the computer. An output element is something that brings information from the computer. The screen, speakers, and printer are examples of output element.

Exploration Question: Can you think of any devices that have both input and output elements?

[Show answer/example](#)

## Summary

Just like the human body, computers have many parts that work together to help it run smoothly. The motherboard holds all the circuitry in place. The power supply gives electrical power to everything. The CPU is the central processing unit that is responsible for all computations of a computer. Fans and heat sinks help cool down the computer. RAM and ROM provide memory and storage.



## CSTA Standards

2-CS-02 Design projects that combine hardware and software components to collect and exchange data.

3A-CS-01 Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.

3B-CS-02 Illustrate ways computing systems implement logic, input, and output through hardware components.

### Questions (10)

**1. Which of the following is memory that will disappear when the computer is shut off?**

MULTIPLE CHOICE

**Choose the correct answer:**

- A. RAM
- B. ROM
- C. Heat Sink
- D. CPU

**2. Which of the following is memory that will stay when the computer is shut off?**

MULTIPLE CHOICE

**Choose the correct answer:**

- A. RAM
- B. ROM
- C. Heat Sink
- D. CPU

**3. Which of the following is responsible for the ability of a computer to process information?**

MULTIPLE CHOICE

**Choose the correct answer:**

- A. CPU
- B. Heat Sink
- C. Motherboard
- D. Power Supply



MULTIPLE CHOICE

**4. Which of the following holds the circuitry and components together?**

**Choose the correct answer:**

- A. motherboard
- B. CPU
- C. power supply
- D. RAM

MULTIPLE CHOICE

**5. Which of the following provides electricity to the computer components?**

**Choose the correct answer:**

- A. Power Supply
- B. Heat Sink
- C. CPU
- D. Motherboard

**6. Which of the following are methods to help cool down the computer? Select all that apply.**

SELECT MULTIPLE

**Select all that apply:**

- A. Fan
- B. Heat Sink
- C. RAM
- D. Motherboard

MULTIPLE CHOICE

**7. Which of the following is the most responsible for generating heat in a computer?**

**Choose the correct answer:**

- A. CPU
- B. Motherboard
- C. ROM
- D. RAM



**8. Which of the following are considered input devices? Choose 2.**

SELECT MULTIPLE

**Select all that apply:**

- A. Mouse
- B. Microphone
- C. Speaker
- D. Screen

**9. Which of the following are considered output devices? Choose 3.**

SELECT MULTIPLE

**Select all that apply:**

- A. Printer
- B. Trackpad
- C. Screen
- D. Speakers

**10. Which of the following is considered "long term memory?"**

MULTIPLE CHOICE

**Choose the correct answer:**

- A. RAM
- B. ROM
- C. CPU
- D. Heat Sink



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## Answer Keys & Solutions

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### Questions

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1. Which of the following is memory that will disappear when the computer is shut off?

MULTIPLE CHOICE

Correct Answer:

- |              |             |
|--------------|-------------|
| A. RAM       | ✓ Correct   |
| B. ROM       | ✗ Incorrect |
| C. Heat Sink | ✗ Incorrect |
| D. CPU       | ✗ Incorrect |

**Explanation:**

This stands for Random Access Memory

2. Which of the following is memory that will stay when the computer is shut off?

MULTIPLE CHOICE

Correct Answer:

- |              |             |
|--------------|-------------|
| A. RAM       | ✗ Incorrect |
| B. ROM       | ✓ Correct   |
| C. Heat Sink | ✗ Incorrect |
| D. CPU       | ✗ Incorrect |

**Explanation:**

This stands for Read Only Memory

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### 3. Which of the following is responsible for the ability of a computer to process information?

MULTIPLE CHOICE

**Correct Answer:**

- |                 |             |
|-----------------|-------------|
| A. CPU          | ✓ Correct   |
| B. Heat Sink    | ✗ Incorrect |
| C. Motherboard  | ✗ Incorrect |
| D. Power Supply | ✗ Incorrect |

#### **Explanation:**

The "brain" of the computer.

### 4. Which of the following holds the circuitry and components together?

MULTIPLE CHOICE

**Correct Answer:**

- |                 |             |
|-----------------|-------------|
| A. motherboard  | ✓ Correct   |
| B. CPU          | ✗ Incorrect |
| C. power supply | ✗ Incorrect |
| D. RAM          | ✗ Incorrect |

#### **Explanation:**

It's often green

### 5. Which of the following provides electricity to the computer components?

MULTIPLE CHOICE

**Correct Answer:**

- |                 |             |
|-----------------|-------------|
| A. Power Supply | ✓ Correct   |
| B. Heat Sink    | ✗ Incorrect |
| C. CPU          | ✗ Incorrect |
| D. Motherboard  | ✗ Incorrect |



**Explanation:**

This supplies power

**6. Which of the following are methods to help cool down the computer?  
Select all that apply.**

SELECT MULTIPLE

**Correct Answers:**

- |                |             |
|----------------|-------------|
| A. Fan         | ✓ Correct   |
| B. Heat Sink   | ✓ Correct   |
| C. RAM         | ✗ Incorrect |
| D. Motherboard | ✗ Incorrect |

**Explanation:**

Memory and the green skeleton structure don't help cool down the computer

**7. Which of the following is the most responsible for generating heat in a computer?**

MULTIPLE CHOICE

**Correct Answer:**

- |                |             |
|----------------|-------------|
| A. CPU         | ✓ Correct   |
| B. Motherboard | ✗ Incorrect |
| C. ROM         | ✗ Incorrect |
| D. RAM         | ✗ Incorrect |

**Explanation:**

This component is also responsible for the processing power of the computer.

**8. Which of the following are considered input devices? Choose 2.**

SELECT MULTIPLE

**Correct Answers:**



- |               |             |
|---------------|-------------|
| A. Mouse      | ✓ Correct   |
| B. Microphone | ✓ Correct   |
| C. Speaker    | ✗ Incorrect |
| D. Screen     | ✗ Incorrect |

**Explanation:**

Input devices bring information to the computer.

**9. Which of the following are considered output devices? Choose 3.**

SELECT MULTIPLE

**Correct Answers:**

- |             |             |
|-------------|-------------|
| A. Printer  | ✓ Correct   |
| B. Trackpad | ✗ Incorrect |
| C. Screen   | ✓ Correct   |
| D. Speakers | ✓ Correct   |

**Explanation:**

An output device brings information from the computer to the user.

**10. Which of the following is considered "long term memory?"**

MULTIPLE CHOICE

**Correct Answer:**

- |              |             |
|--------------|-------------|
| A. RAM       | ✗ Incorrect |
| B. ROM       | ✓ Correct   |
| C. CPU       | ✗ Incorrect |
| D. Heat Sink | ✗ Incorrect |

**Explanation:**

Read Only Memory is considered long term.



