

Lesson 1.1: How Does a Computer Work?

Objectives

In this lesson, students will:

- ❖ Learn what constitutes computer hardware and software
- ❖ Gain a high level understanding of how data travels from input device to output device through a computer
- ❖ Be introduced to what an operating system does
- ❖ Recognize what input and output device are

Agenda

1. How Does a Computer Work	10 mins
2. Student Activity: How Does a Computer Work	15 mins
3. Computer Hardware and Software	10 mins
4. Student Activity: Hardware and Software	10 mins
5. Wrap Up and Reflections	5 mins

Preparation

- Projector and speakers for video and class discussion
- Print student activity worksheet (one per student or one per student pair)

Resources & Links

- How does a computer work: <https://tinyurl.com/y7ro2bos>
- Video of how Software and Hardware work together: <https://tinyurl.com/y7juowhw>

1. How Does a Computer Work



Prompt students for a few answers to these questions.

What is a computer? How do we know if something is a computer? How does a computer work?

Let's watch this video to learn a little more about computers:

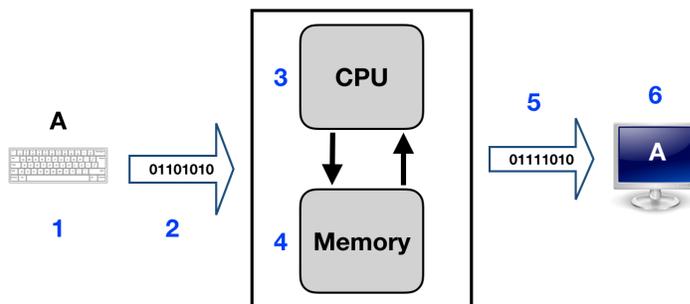
<https://tinyurl.com/y7ro2bos>

2. Student Activity: How Does a Computer Work



In this activity, students revisit material from the video. Distribute the activity worksheet, one per student. Review the solution with students as a class activity.

Solution:



- 3 How to display the letter 'A' pixel by pixel is calculated
- 2 The keyboard converts the letter into a binary number which is sent to the computer
- 6 The pixel information is converted so that we can see the letter 'A' on the screen.
- 1 A user types the letter 'A' on a keyboard
- 4 The instructions on how to draw the letter 'A' as pixels are stored
- 5 The pixel information is sent as binary to an output device

2. All computers do the same 4 things. What are they?

- ❖ Input information
- ❖ Store information
- ❖ Process information
- ❖ Output information

3. Give an example of 1 input device and 1 output device.

Input device: keyboard, mouse, webcam, smartphone screen

Output device: monitor, printer, smartphone screen, robot

3. Computer Hardware and Software



Engage students in an interactive discussion and instruction:

The input and output devices, the CPU, memory and many other components that you can see inside a computer are called **Hardware**.

You may remember that a computer can only do what it is told to do by a computer program. Apps, instructions and all programs are called **Software**.

So how exactly do the hardware and software interact with each other? The following video can help explain this.

 <https://tinyurl.com/y7juowhw>



Discussion Points:

- What did you learn from this video?
- Which parts of the computer are hardware?
- What does the operating system do?
- What is software?

4. Student Activity: Hardware and Software



In this activity, students revisit material from the video. Distribute the activity worksheet: “**Hardware and Software**”. Students can work in pairs or on their own.

Solution:

- A. What are 2 things an Operating System does?
- 1) Install new programs
 - 2) Decide when a program is run by the CPU
 - 3) Decide whether a program can access an input or output device
 - 4) Control computer hardware
- B. Software tells the computer what to do.

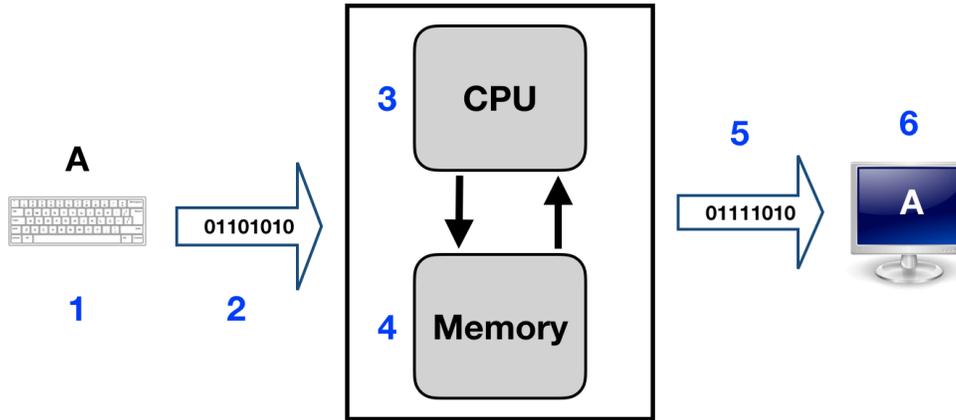
True

5. Wrap Up and Reflections**Reflection Points:**

- What did you learn today?
- What is the operating system?
- What is hardware ? What is software?
- What are the 4 things all computers do?

Activity Worksheet: How Does a Computer Work

- Place the correct number inside the circle to match the description of how input travels through the computer to become output



- How to display the letter 'A' pixel by pixel is calculated
- The keyboard converts the letter into a binary number which is sent to the computer
- The pixel information is converted so that we can see the letter 'A' on the screen.
- A user types the letter 'A' on a keyboard
- The instructions on how to draw the letter 'A' as pixels are stored
- The pixel information is sent as binary to an output device

- All computers do the same 4 things. What are they?

- ❖ _____ information
- ❖ _____
- ❖ _Process_____
- ❖ _____

- Give an example of an input device and an output device

Activity Worksheet: Hardware and Software

A. What are 2 things an Operating System does?

1) _____

2) _____

B. Software tells the computer what to do.

True

False