# What parts make up a digital device?

## Introduction

In this lesson, students develop an understanding of the relationship between inputs, processes, and outputs knowledge and apply it to devices that they will be familiar with from their everyday surroundings.

## Learning objectives

To identify input and output devices

* I can classify input and output devices
* I can describe a simple process
* I can design a digital device

## Key vocabulary

Digital device, input, process, output

## Preparation

**Subject knowledge:**

* You will need to be familiar with the inputs and outputs of a range of digital devices.
* You will need to understand that devices can have one input that leads to several outputs (eg starting a video leads to outputs from the screen and the speaker) and that many inputs can lead to one output (eg using a mouse and a keyboard to produce a document).

**You will need:**

* [Teaching slides](https://www.digitaltechnologieshub.edu.au/media/k0hig03g/input-output-devices.pptx)

## Assessment opportunities

You can assess whether learners:

* can classify input and output devices
* can describe the relationship between inputs, processes, and outputs for existing digital devices
* can describe the relationship between inputs, processes, and outputs through evaluating learners’ explanations of how their inventions work.

## Outline plan

Please note that the slide deck labels the activities in the top right-hand corner to help you navigate the lesson.

*\*Timings are rough guides*

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| **Introduction**  (Slides 1–4)  5 mins | Display slide 2. Introduce the learning objective and success criteria.  Use slides 3 and 4 to remind learners about Lesson 1. Show learners a selection of input and output devices that are used with, or within, digital devices — show physical devices if you can, or alternatively, use the images in the A1 Teacher handout. |
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| **Activity 1**  (Slides 5–6)  10 mins | **Input or output?**  Using slide 5 (or large hoops, if you have physical devices), show a Venn diagram consisting of circles for ‘input’ and ‘output’. Using the A1 Teacher handout, the animations on slide 5, or physical devices if you have them, place an example of an **input** device (eg a keyboard) in the ‘input’ circle, and place an example of an **output** device (eg a screen) in the ‘output’ circle. Ensure that learners are aware that there are devices that fit into both circles (eg a touchscreen) and some that do not fit into either (eg a cable).  Then, show learners the other devices one by one and ask where these belong in the Venn diagram.  Answers (also revealed in the animations on slides 5 to 6):   * Input devices: Keyboard, mouse, microphone, button (on a pedestrian crossing) * Output devices: Speakers, monitor, printer, traffic lights (on a pedestrian crossing) * Device with input and output: Touchscreen * Device without input or output: Cable   **Note:** Learners’ only experience of printers may be of multifunctional printers that have the ability to scan documents. These multifunctional machines are input and output devices and go into the intersection of the Venn diagram.  **Note:** Some learners may not be familiar with webcams. Explain that some computers (often laptops) have integrated webcams, which perform the same function as the example in the slides, but look different. |
| **Activity 2**  (Slide 7)  10 mins | **Match input, device, and output**  Explain to learners that in this activity, they will match up inputs, digital devices, and outputs. Explain that the items named on the slide have been sorted as they were in the Venn diagram, but this time, they have been arranged into columns, and learners will draw connecting arrows between items in the different columns that match up.  Using the animation on slide 7, give examples of where there is a connection between one input, one digital device, and one or many outputs, each time articulating the whole sentence, eg:   * “Pressing the keys on the keyboard (input) of a laptop (device) can change what you can see on the screen (output).” * “Pressing the keys on the keyboard (input) of a laptop (device) can also make a speaker (output) play sounds, or it can make a printer (output) print something.”   Give an example of where there is a connection between one input, one or many digital devices, and one or many outputs, articulating the whole sentence, eg:   * “Tapping on a touchscreen (input) of a smartphone or tablet (devices) can make its screen (output) display something and make its speaker (output) play sounds.”   **Note:** Connections between many inputs, one device, and one output are also possible.  Ask learners to discuss further connections between the items in the columns, and to then complete the A2 Activity sheet.  **Scaffolding opportunity:** Focus the activity on devices that learners can see within the classroom to aid recognition of what inputs and outputs they have.  **Explorer task:** Ask learners to consider digital devices explored in Lesson 1, eg a digital camera or a smart speaker, and what the inputs and outputs for those devices are. This encourages them to make connections with their previous learning. |
| **Activity 3**  (Slides 8–9)  15 mins | **Invent your own digital device**  Explain to learners that they are now going to use their understanding of inputs and outputs to invent their own digital device. Some ideas are provided on slide 8, but learners can also think up a completely different invention. Tell learners that they must consider how their invention will work, including what inputs it will need (for example, it could have a button or a screen), and what its processes will be.  Share the example on slide 9 and then let learners invent their own device on a blank sheet of paper or on the A3 Activity sheet.  Once learners have completed their designs, invite them to share them with other learners, explaining how their devices would work.  **Note:** Learners can do this activity individually or in pairs.  **Explorer task:** Ask learners to include multiple inputs and/or outputs as part of their device and describe how these work together as part of the invention’s process. |
| **Plenary**  (Slides 10–11)  5 mins | **Learners share their invention**  Ask learners to show their inventions either to each other or to the whole class. Encourage learners to explain the input, process, and output of their inventions. Highlight correct use of terminology.  Display slide 10 and read out the text to draw learners’ attention to a real-world example. Ask learners to identify the digital devices or interactions with a digital device in the text. Discuss the digital devices or interactions (highlighted on slide 11), and remind learners that our world is filled with digital devices and tools. |