

# Electronic devices

Games and puzzles in escape rooms have evolved from paper and pen riddles to the current generation of electronic based puzzles. We can now use a minicomputer like the Raspberry Pi or a microcontroller like the Arduino to create puzzles or game stages for an escape room. We can also use an Othello or Reversi board game and switches like a magnetism activated reed switch and a RFID or NFC reader, as inputs for the game stage. Correct inputs or identification of the RFID will trigger a wireless communication using laser beam, with a remotely located Arduino board linked to a 4-digits 7 segment display serving as a clock or counter. In response to the laser beam, the Arduino will display a four-digit password for the next stage of the escape game. Teachers could also find external support from an IT expert or a tech teacher from a partner school in order to use these devices.

## Material required:

### electronic devices such as:

- Arduino microcontroller – it is a board able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.
- Raspberry minicomputer- it is used to read various types of sensors and to drive actuators that control lights, open doors, or play back media.
- RFID buttons (Radio Frequency Identification)- they are great for sensing presence, identification, etc., and they're small, so they can be easily sewn into clothing or inserted into enclosures.
- Morse code button- the players must find the correct code and enter it by pressing a button, using actual Morse code to unlock magnetic lock.
- Any other electronic device (laptops, speakers, led, touch displays, keypads, sensors, controllers, etc.).



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## Possible uses

Electronic devices can be used for creating the very puzzle, sensing presence, identification, decoding, communication. Students could activate a hidden switch by approaching a car (w/ RFID technology) or they could play a code with a speaker. They could also do a "pushing button maze" that is connected to LED lights They can also detect light, humidity, temperature, sound levels, etc. For example, the Morse code button is used to communicate with the Morse code. The user has to press the button to give the right word in Morse code to open the lock.

## Possible restrictions

- The players may not have the ability to use them (difficulty in understanding the codes)
- They may not be durable, reliable, affordable
- They're often significantly and needlessly over-complicated
- The teachers most probably will have to take some time to learn how to use the devices themselves.

## Is it inclusive for SLD?

Yes, but sometimes you have to accommodate the activities to the specific needs of some students. As some learners might have motor difficulties, bear those in mind when choosing the material for the escape game. For instance, try to choose devices that are easy to manipulate.

Ziemann, V. (2018), A Hands-on course in sensors using Arduino and Raspberry Pi. 1<sup>st</sup> edition, CRC Press

