

Hack the Internet

*Escape room developed by the Laboratorio tecnologie e media in educazione
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Overview

Age	11-14
N. of participants	Minimum 8 (two per group), maximum 16 (4 per group)
Subject	Digitalization
Keywords	Internet, digital world, internet cables, protocols, IP addresses, data centers
Play time	30-40' plus 45' of debriefing
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In a few words

The participants of this escape room have to stop one of the biggest terrorist attacks of the century: a hacker group by the name of hack4humans announced they are going to shut the internet down. To stop them, players would have to find the hints left by hack4humans and find where they are hiding.

Learning outcomes

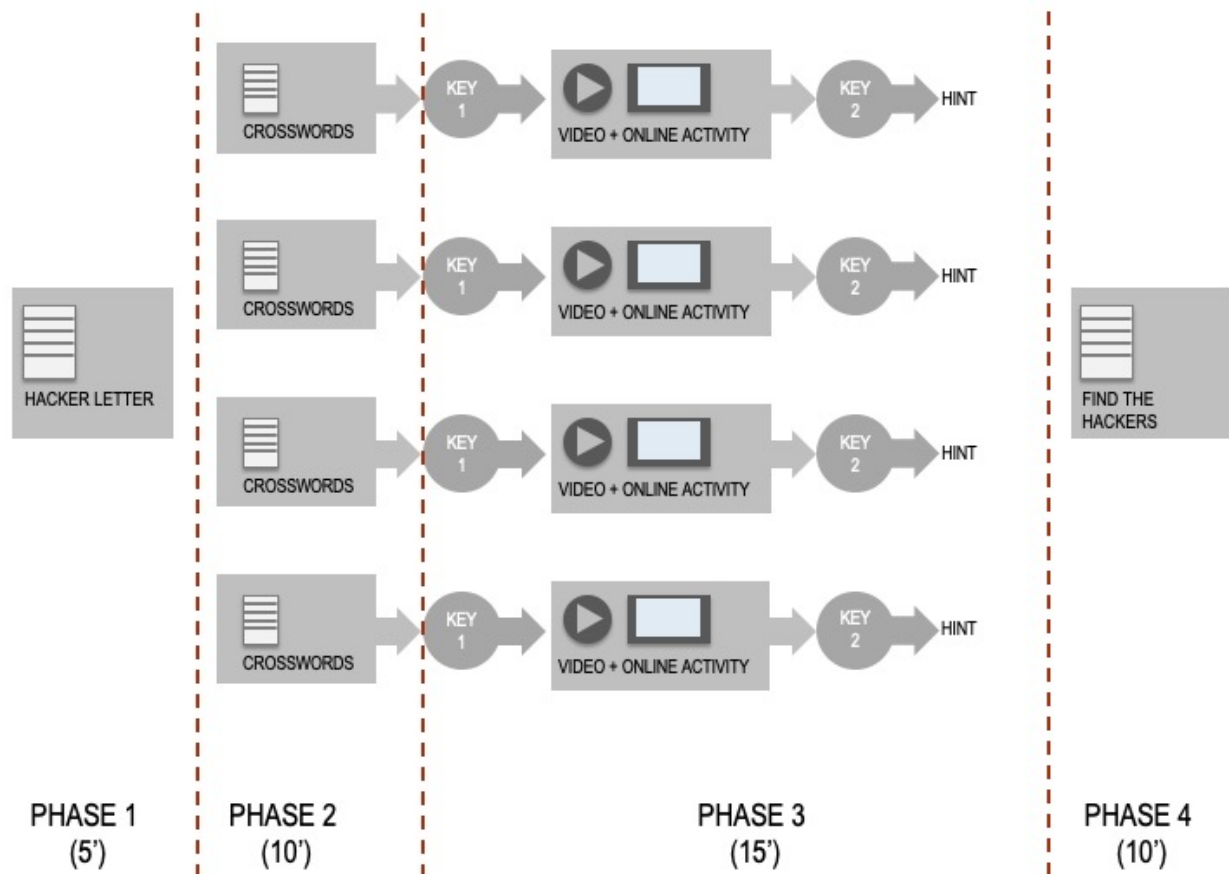
This escape room was developed in order for the participants to

1. Learn some key elements of the internet physical architecture, in particular protocols, data centers, internet cables, IP addresses.
2. Develop the idea that the Internet is a physical infrastructure (and not "magic", "app", "icon", "cloud")

Use scenario

This escape room is addressed for a middle school class (or last year of elementary school) that is already working on an introduction to informatics and the net. Participants have to be split in four working groups of the same size.

Gameflow



PHASE	DURATION	DESCRIPTION	MATERIALS
PHASE 1	5'	<i>Introduction</i> The game master welcomes the players and splits them on in four groups starting the storytelling by the means of the hacker letter. Timer starts (30 mins)	Hacker letter
PHASE 2	10'	<i>The first clue</i> Participants start solving the crosswords on their table (4 groups). The keyword they find has to be inserted online to start PHASE 3.	4 crosswords (1 per table)
PHASE 3	15'	<i>The challenge</i> Groups have to solve a puzzle online. The key found has to be inserted in the appropriate input field on the Web page. If the key is correct, hints to find the hackers will appear.	Online materials (see below)
PHASE 4	10'	<i>Find the Hackers</i> Groups share the hint they found and together they work on the map to find where the hackers are hiding. The name of the location should be entered in an online form to "send the police".	Final web page for the final phase on the beamer. The map can also be printed in A3 size (the bigger the better)

Online materials: <http://mediainpiazza.ch/internet/en/>

Final page: <http://mediainpiazza.ch/internet/en/police/>

Escape Room setup

Escape room materials

- Website found in the "Web-based ER" folder, it has to be uploaded on an online platform which is accessible from the school network
- 1_Hackers_letter.pdf - Hacker letter to be printed twice
- Address_Crosswords.pdf, Data_Center_Crosswords.pdf, Internet_Cables_Crosswordsverba.pdf, Protocol_Crosswords.pdf - Crosswords to be printed and placed one per table.
- Map_solution.pdf - Map used to find the hackers, can be printed or showed on a beamer. You can also use the webpage in the police folder to roll out the final phase. If that is the case, the accepted solution is without umlauts (i.e., "Jonkoping" and not "Jönköping").
- Solutions.pdf - Puzzle solutions, can be printed

Room equipment

- Pencil and paper for each group / table
- Four Web-enabled devices (smartphones, computer, tablet, ...)
- A beamer with audio to show the map webpage (PHASE 4) and the timer

Room setup (about 15 minutes)

- Prepare the four tables / group workstations, each one with a different crossword, pencil, paper, and a Web-enabled device
- Every internet access should have a browser in incognito mode (to avoid saving the input data in the autosuggest in case of a reboot of the escape room) with a single tab open pointing to the Web site of the escape room
- Place the two hacker letters around
- Set up the beamer and the timer

Room reboot (about 15 minutes)

- Gather the completed crosswords and the paper used by the students to take notes
- Reload the base page of the escape room
- Print once again the crosswords and place them one per workstation
- Place the hacker letters in case they have been moved
- Hide the map page with the solution and replace it with the timer reset to 30 minutes

Escape Room in Action

Starting the escape room

Here is a possible starting point to introduce the narrative of this escape room.

"Guys, the police just issued a statement in which it announces they discovered a very serious threat. You know that nowadays everything is connected to the Internet - not only your cellphones and Whatsapp, but also banks, hospitals,

railway stations, ... What would happen if Internet would be shut down or destroyed? Well, a group of hacker threatened to destroy the net. Here is the letter tha the police received"

(letter is read together with the students)

"Very well, your task is to stop this hacker team by finding where they are hiding. In the letter they told us they left some clues somewhere... the first one is a hidden word in crosswords! Be careful, you only have 30 minutes to find them!"

Playing the escape room

After starting PHASE 1 (see above), the game master shouldn't help the students during the various activities. If asked by the students, the game master can:

- Clear out the clues on the crosswords if they are unclear in PHASE 2
- Help with the language (English terms for non-English speakers) and with the interface of the Web site in PHASE 3
- Help using the computers / Web enabled device during PHASE 3 (i.e., copy-paste, work on two different tabs or windows, ...)

Debriefing

The key of the debriefing phase is to recollect all the "puzzle pieces" that compose the narrative and educational aspects of the escape room. Every single group has seen a small aspect of the Internet physical architecture: these elements have to be shared by the students and unified to develop the big picture and understand "what is the Internet".

1. A first step would then be to let each group explain to the class what they worked on and which element of the net were the hacker willing to destroy. In this phase it is important to pay attention to technical terms (IP addresses, encryption, data center, packets, etc.).
2. During the second step of the debriefing it is important to focus on the Internet as a physical infrastructure, built just like highways or railways. An interesting support for this second step would be to show the video "A journey to the bottom of the internet" found here <https://www.youtube.com/watch?v=H9R4tznCNB0>
3. The third step helps reorganizing all the elements relative to how the Internet works: the digitalization of information, packet segmentation, packet journey across nodes with an address, etc. A good resource for this step can be "The internet revealed" found here <https://www.youtube.com/watch?v=cpAUedhcjAY>

Key elements can be written down by the students on their books. The booklet *The Internet, how it works* can be a good support as well. It can be found here https://internetstiftelsen.se/docs/The_Internet_How_it_Works.pdf

Suggested debriefing time: 30'-40'