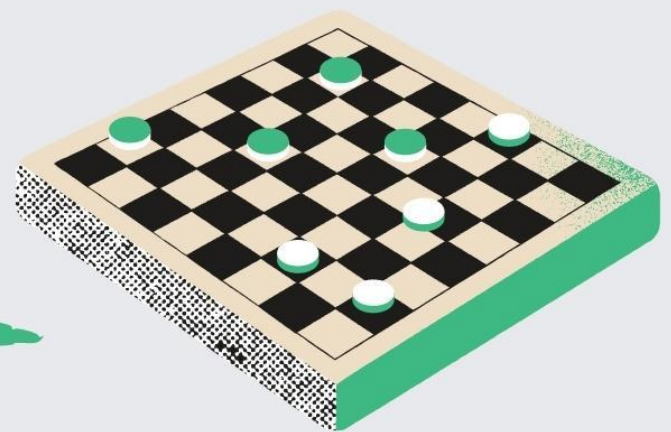
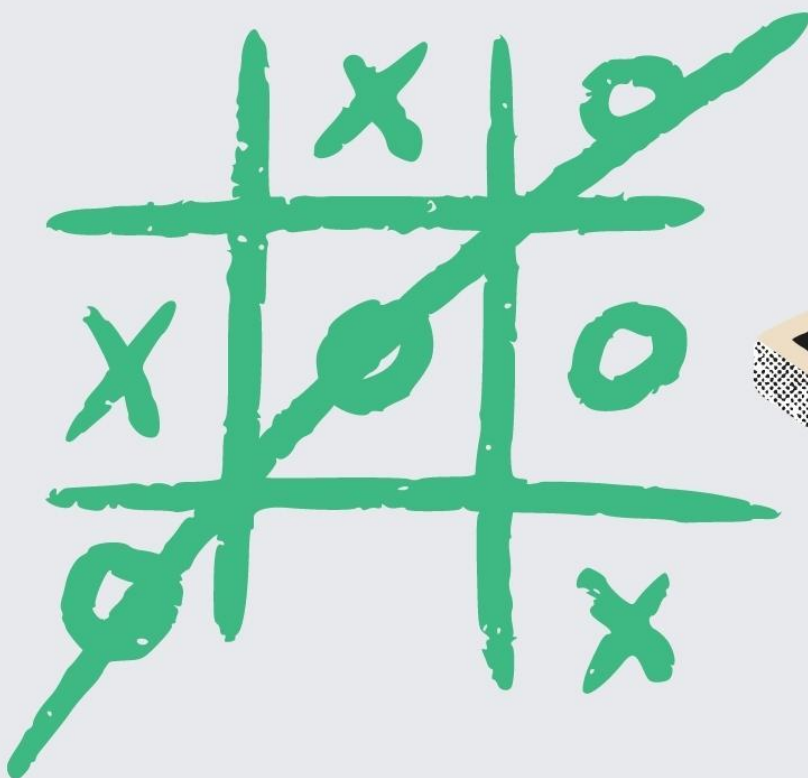





The CodER Physical Scenarios Handbook

Instruction for youth workers

Title: 3D Tic – Tac – Toe





3D Tic-Tac-Toe

Instruction Guide for youth workers/ teachers

1. Introduction

a. Context

The CodER project seeks to enable youth workers to gain basic knowledge in programming and microcontrollers so they can transfer this knowledge to young people through non-formal education and using innovative methods like escape room creation. CodER also aims to address youth unemployment by giving them access to training relevant to the labor market's needs. Basic programming knowledge is a skill needed in every field discipline nowadays, from social sciences to business and entrepreneurship. The objective is to use escape rooms appropriately to positively impact young people's engagement and learning in programming and microcontrollers. The aim is for ERs to be converted into effective and efficient educational tools which take into consideration the validated results of the already existing research employs various synchronous digital tools, such as online courses and interactive platforms, digital gamified processes, digital media, VR Elements, apps, QR codes, etc.

b. Partners

Digijeunes www.digijeunes.com/

CIP (website) www.citizensinpower.org

RITE (website) <https://ritecy.org/>

Challedu (website) <https://challedu.com/>

Kalimera (website) www.kalimera.hr

AKMI (website) <https://iek-akmi.edu.gr/>


To know more about the project: <https://coderproject.eu/>

c. Learning goals of the ER

- To raise awareness among youth on gender equality in STEM by promoting historical female scientists as role models.
- To familiarise the basics of coding to young people using Python language.
- To share knowledge on microcontrollers among young people.

d. Targeted audience



- 
- ★ Age: 15-35
 - ★ Level: Advanced
 - ★ Group size: 5 players
 - ★ Type of target group: People interested in coding and videogames, with basic knowledge of microcontrollers and python programming language.

2. The ER scenario

a. Storyline

Carol Shaw is believed to be the first professional female video game designer. She first used a computer in high school, where she excelled at Maths and enjoyed playing text-based games.

After graduation, she started working in the video gaming industry and became one of the earliest female programmers. Carol loved her job and was continuously working on developing new games. After hours of testing and working, she developed the games named *Video Checkers* and *3-D Tic-Tac-Toe* in 1978, two of the first commercially-released games written by a woman. When the company's CEO learned this news, he immediately launched them without giving her any credit!

But you, as one of her favourite colleagues, should help her prove that all of the ideas and work were hers! Select proofs before the reporters and cameras arrive!

b. Objective of the game

When Carol activated the *Video Checkers* to showcase her work to the company's CEO, she created a code that records the views of the folders. The encrypted system of the company locked her access to all the folders related to her work. But she has strong links with Steve Hendrick, the artist who created all the artwork for the game. He has the key elements to help your team in order to access the system. The group has to follow the clues in order to collect all proofs.

3. Creating the setting

a. Needed materials/ equipment

★ Given

- Folder for each USB Stick (to be allocated in USBs)
- Digital file of 3D Tic Tac Toe (part of an activity)
- Chess board (to be printed)
- Digital Posters (to be printed)



- Digital Sketchbook Drafts (to be printed)
- Desktops Background Image (to be displayed on PC)
- Tic Tac Toe Papers (to be printed)
- QR codes

★ **Not Given**

- 1 Computer & dual screen if available
- 1 Desk
- 5 USB sticks
- Microcontrollers
- Hidden Markers
- Smartphone with camera that reads QR codes
- Sketchbook
- Notepads & other stationary materials

b. Setup of the room

The Escape Room Starts with the following items available:

- 1 Computer/laptop with charger & Desk (Place accordingly to the space)
- 1 sketchbook (Placed in another furniture available away from the desk)
- 5 USB sticks (Place in hidden spots around the room, USB sticks are crucial for the game)
- 3 posters (Placed in any wall of the room)
- 1 Notepad & tic tac toe papers (Placed on top of the desk)
- 1 Microcontroller (set up next to the Computer with a note saying: Find five clues before using the microcontroller)
- Post-it Note (place near desk)

It is suggested to add relevant accessories and furniture (e.g small library) to the room to make it more appealing to a gaming programmers office; it could include things such as a keyboard, mouse, chair, sketch pad, hard disk, computer, screens etc.)

c. Installation and reset

Step 1: Initially, you need to download all materials provided for this ER and set up the computer of the space. When the folder is set up on the desktop of the computer named as “Carol Shaw”, please lock access to this folder with the given following password: “2452.051 4”. Additionally, you can add more folders by the name of other members of the Staff.





Step 2: Then add the chessboard as the default background, with fit image settings and lock access to the PC/Laptop with the following password: b7f7d5a4h3e2b1. ([Canva Link](#))

Step 3: Then you need to gather information respectively to each USB Stick and name the sticks with the following pseudonyms: Tommy, Natasha, Louiza, Jonathan, and Marta. ([Canva Link](#))

Step 4: Connect the microcontroller to the lamp and write “GEEKSFORGEEKS” next to the panels. When they connect ‘GEEKSFORGEEKS” code to number 3, the lamp will light up.

Step 5: After that, you need to create Steve’s Sketchbook with the post-it note and additional designs. Place the sketchbook around the room, but not in a hidden place. ([Canva Link](#))

Step 6: Finally, you need to print all complementary materials, install graphics on the wall and place the tic-tac-toe paper on the desk. ([Canva Link](#))

d. To have in mind

It is suggested that relevant adaptation to the spaces can be made as long as all materials are used in some way. If an item is missing, then the ER might not run smoothly. Ensure that you have followed the instructions when setting up the room, that all the materials are appropriately placed, that all the files have codes in the USB sticks, and that the microcontroller is correctly installed.



4. The game

a. The game masters

When the players arrive, the game master should make a short introduction, engage them through the story and give them the printed file named “Template for participants”. Also, it’s essential that he/she stays close to them so he/she can facilitate them in case they get stuck in a riddle.

b. Introduction & instructions

It’s vital that the players receive a short introduction about the Escape Room theme, listen to the story, and understand what they have to do. Make clear to the players that they will have to use all the elements they find. The game master could also take the role of Carol Shaw (or another relevant professor/scientist) and participate in the procedure. In this case, the game master could pretend that he/she doesn’t remember anything from the solutions of the riddles and only give some hints when the players get stuck.

c. Hints

The Escape Room should last around one hour; if the game master sees that the players take much time to solve a riddle or discover what they have to do next, he/she should try and help them by pointing out some hints. In order to do so, the game master must have a good understanding of the mechanics of the game and its stages.

d. Game stages

★ The beginning

Every time they make a mistake, they will lose a point. The Game will ~~have~~ start by granting the players 60 points; every time they require an extra hint, they will lose a point. They can only make three attempts to enter the password of the laptop, and each time they enter a new password, they will lose 5 points. If participants lose points they will still be able to continue the game. A warning will notify how the score will count in the ‘**instruction guides for adventurers**’.

★ The course of the game & solutions

▪ Challenge #1 Unlock the Computer

The players will enter a room where they will first notice a password protected computer. Their first challenge is to unlock the computer. As soon as they open the screen, they will see an image on the background of flowing chess with flowers on top



([Canva Link](#)). The image will be the first clue to connect it to the “real” given chess, printed and placed on the table. Typical chess boards indicate numbers on the y-axis and letters on the x-axis. On the printed paper, they will be able to see the chess and a key to read it. The relationship between the printed chess and the digital one in the background will give them the computer password. The numbering and lettering of the chess board is oriented to the position of the player who will use the white pieces combined with the digital background chess and looks like this:



8	a8	b8	c8	d8	e8	f8	g8	h8
7	a7	b7	c7	d7	e7	f7	g7	h7
6	a6	b6	c6	d6	e6	f6	g6	h6
5	a5	b5	c5	d5	e5	f5	g5	h5
4	a4	b4	c4	d4	e4	f4	g4	h4
3	a3	b3	c3	d3	e3	f3	g3	h3
2	a2	b2	c2	d2	e2	f2	g2	h2
1	a1	b1	c1	d1	e1	f1	g1	h1
	a	b	c	d	e	f	g	h

Image SOLUTION not given to participants

PC Password: b7f7d5a4h3e2b1



- **Challenge #2 Solve riddles in USB sticks & Collect Codes**

When the team enters the room, they will find around USB sticks of the company's employees. All USB sticks should be named after a colleague's pseudonym. The USB stick needs to be hidden respectively to the space available, under furniture etc. (not too hard to find).

At this moment, the escape room follows an open model of Escape Rooms, which means all information collected is beneficial for the final goal.

They must pluck them into the computer to solve each riddle separately and collect solutions. Further information for each USB stick is given below. All the solutions will be helpful in the final step to unlock the encrypted folder found on the desktop named Carol Shaw. All the information to be collected are 5, 24, 2.0, GEEKSFORGEEEKS, 3, 51, and 4. The order in which the players find the outputs does not matter in solving the riddle.

[Canva Link USB Sticks](#)

[Canva Link Python USB Solutions](#)

From all USB's players need to collect the following outputs:

- ★ USB Jonathan: 5
- ★ USB Marta: 24
- ★ USB Louiza: 2.0
- ★ USB Natasha: GEEKSFORGEEEKS & 3
- ★ USB Tommy: 51 & 4

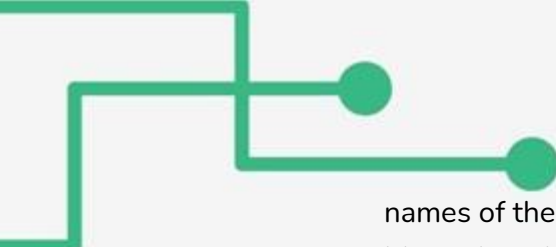
- **Challenge #3: Unlock Carol Shaw Folder on Computer**

Players will find a microcontroller connected to a LED lamp inside the room. The solution is in Natasha's USB, where a Led lamp indication will direct students to the microcontroller. The phrase "GEEKSFORGEEEKS" will be placed at the end of the microcontroller's panel mixed with numbers. Players need to identify number 3 as the USB's output and connect the lamp.

- **Challenge #4: Pencil Trace (not Trade)**

This is the final stage of the ER; post-it papers with the answers revealed. The post-it paper will be inside Steve's Sketchbook and will reveal the





names of the colleagues whose USBs were used, in the following sequence: Marta, Jonathan, Louiza, and Tommy. This will form the unique password: “2452.0514”. This password will unlock Carol’s folder on the desktop.

[Steve Sketchbook Canva Link](#)

★ Ending

▪ In case of success

If the players solve all the riddles, they will gain access to the files with encrypted codes that prove that Carol Shaw was the first lady ever creating the game, and they will have solved the Escape Room.

▪ In case of failure


If the players fail to solve all the riddles and successfully reach the encrypted codes or exceed the time set by the game master, a debriefing phase should follow. In this phase, the game master should guide the players again through the Escape Room, show the solutions to the riddles, explain the procedure and encourage the players to understand what didn’t go so well.

e. Debriefing phase and feedback

In the final stage, debriefing is essential in both success and failure cases. The main point of ER is for participants to comprehend the experience and use the knowledge they gain in the future. At this stage, the trainer is suggested giving the players some time (3-5 mins) to reflect and share their experiences, here the trainer can lead the discussion by asking the following questions:

- » Did you enjoy the game? Did you find it engaging?
- » Has the game met your expectations?
- » Were you motivated by the first female video game programmer?
- » How was the level of difficulty for you?
- » What did you learn related to coding?
- » What did you learn related to microcontroller programming?
- » Did you already know some of the tools that were used?
- » Do you want to learn and try these tools more?

After the open discussion of their experience, the trainer could guide the players to explain their solution step by step if they couldn't solve a riddle. Then, it is strongly advised not to let the players leave without asking for some feedback, and also avoid or sending them questionnaires much later, if you, as trainers, want to get more structured feedback; a google form can be given at the end of the game with open-ended questions and ratings about the Escape Room and their overall experience.





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