

ESCAPE ROOM TITLE: The nuclear catastrophe

- **Target Group** 15-16 years old
- **Number of participants** 25-26 students divided in 3 teams
- **Level** 10 grade – General secondary education
- **Time Needed in total** 60 minutes
A timer on the wall
- **Organisation**

The event will take place in a regular classroom repurposed for the escape room as a control room 3 of the Chernobyl power plant. The desks and chairs will be rearranged to form 3 working stations. The students will be divided into 3 teams according to the stations they will occupy. There will be a label for each station with the number of the team and the names of the participants. All the necessary materials will be placed on a table and around the room (the puzzles and instructions will be put around the room in specific places, they will be labelled for each group) Each team will choose: 2 team leaders (to control the group and communicate with the teacher/GM -asking for hints, showing the solved puzzle).

- **Pedagogical Objectives**

- Understand basic concepts of Nuclear Physics
- Explore the structure of atoms of some radioactive elements – Po, Ra, U
- Understand the concept of radioactivity
- Understand Impact of radioactivity on human health and biological systems
- Learn about the achievements of Marie Curie

- **STEAM concepts covered**

Physics- Atomic structure
Technology – Radiology, nuclear physics

- **Background story**

You enter the control room of reactor “3” in the Chernobyl power plant. On April 26 1986, during a safety test on reactor “4” in this powerplant a great nuclear disaster occurred. A large amount of energy was suddenly released, and two explosions ruptured the reactor core and destroyed the reactor building. An open-air reactor core fire that released considerable airborne radioactive contamination for about nine days followed this. It affected the near city of Pripjat, USSR and Western Europe. You have 60 min until a nuclear catastrophe similar to the one in 1986 could happen with the functioning reactor “3”. This will lead to the radioactive contamination of Western Europe and even Asia. To prevent that you and your peers have to solve a number of puzzles.

SCENARIO

- **How will the escape room unfold?**

Students enter the classroom and find their places in the different teams (3 teams). The teacher/GM introduces the players to the escape room verbally. He presents the background story of the Chernobyl power plant and after the announcement about the problem and the potential catastrophe; he explains the students' goal, acceptable behaviour in the room, health and safety issues, emergency cases:

- Nothing is to be obtained by force or by breaking
- Leave the objects in place; do not collect the puzzles from the paper bags- The puzzles must be consulted on site, at the right time and then put back in their place!
- The game master (the teacher) responds to questions only when he wishes.
- Every group has their own version of the puzzles, labelled with the group numbers (1, 2 and 3), you are allowed to search and open only them.
- Do not communicate with the other teams on what you have found, or you will be disqualified and the game will be deemed a failure.
- Each puzzle gives an answer allowing you to move on to the next one
- You will exit the room when you have solved all the puzzles. The teacher verifies the answers at the end.

The start of the game is given by the teacher/GM who sets the timer for 60 minutes. The participants see the instruction for the placement of puzzle #1 which is an article in a journal. After they solve the problem, they find and open the puzzle. They have to find the name of Marie Curie by reading about her life and achievements. The correct answer gives the placement of the next puzzle. Behind Curie's portrait on the wall is "Puzzle 2". It is a part of a manual for the exploitation of laboratory machinery. In it, they have to solve a crossword. The last word of the puzzle (nucleus) is the lead to the next puzzle. The 3-rd puzzle is behind a large cell nucleus. The 3-rd puzzle consists of pictures connected to the phenomenon radioactivity which are a part of an old photobook. When they find the correct answer, they have to use it as a lead for the location of the next puzzle. Behind a sign for radioactivity, there will be puzzle #4. In it they have to watch two videos related to one another. When they find the correlation: mutation, the students have to connect it to the molecule which it affects- the DNA molecule. Puzzle #5 will be behind a large 3D model of a DNA molecule as a part of a health report to the medical Centre of the facility. In this puzzle, they have to read a mirrored text about Marie Curie and the effects of radiation on her health by using a reflective surface. They have to use the symptoms of two diseases and point one of the two as the condition, which Curie suffered from. The answer is acute radiation syndrome and the students have to find the abbreviation of this disease- ARS. This abbreviation will be on a button, which will open the exit of the escape room.

- **Ambiance and decor elements in place**

The classroom will be repurposed for the escape room as a control room of the Chernobyl power plant with 3 working stations. The desks and chairs will be rearranged to form 3 working stations. The students will be divided into 3 teams according to the stations in which they will occupy. In front of every single station, there will be a table with the materials.

All the necessary materials are placed on each table (the puzzles and instructions will be around the room with labelled texts, pictures etc).

Teacher's desk – computer/laptop, multimedia, timer on the wall behind the teacher. The multimedia will be used to project a visual of a Chernobyl control, room.

There will be laboratory equipment, which will imitate the environment of the power plant.

- **Introductory information given and format**

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- **Escape Room phases and time needed**

Phase 1/Puzzle 1: 5-10 minutes
 Phase 2/Puzzle 2: 15-20 minutes
 Phase 3/Puzzle 3: 5-10 minutes
 Phase 4/Puzzle 4: 10 minutes
 Phase 5/Puzzle 5: 10 minutes

- **Materials given to the students**

<input type="radio"/>	Pens/Pencils
<input type="radio"/>	Paper
<input type="radio"/>	Highlighters
<input type="radio"/>	Written materials, texts and pictures
<input type="radio"/>	Paper bags – 5 for each station containing the materials for each puzzle

- **General presentation of enigmas/puzzles**






Puzzle 1 – Comprehensive reading of a text.

Puzzle 2 – Solving a crossword.

Puzzle 3 – Observing pictures and recognising the term radioactivity.

Puzzle 4 – Watching a video, observing related pictures and recognising the term mutation.

Puzzle 5 – Diagnosing Marie Curie’s condition-acute radiation syndrome- ARS.

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-  Escape room/puzzle 2: Solving a crossword.
-  Escape room/puzzle 3: Observing pictures and recognising the term radioactivity.
-  Escape room/puzzle 4: – Watching a video, observing related pictures and recognising the term mutation.
-  Escape room/puzzle 5: Diagnosing Marie Curie’s condition-acute radiation syndrome- ARS.

- **List of Enigmas/Puzzles**