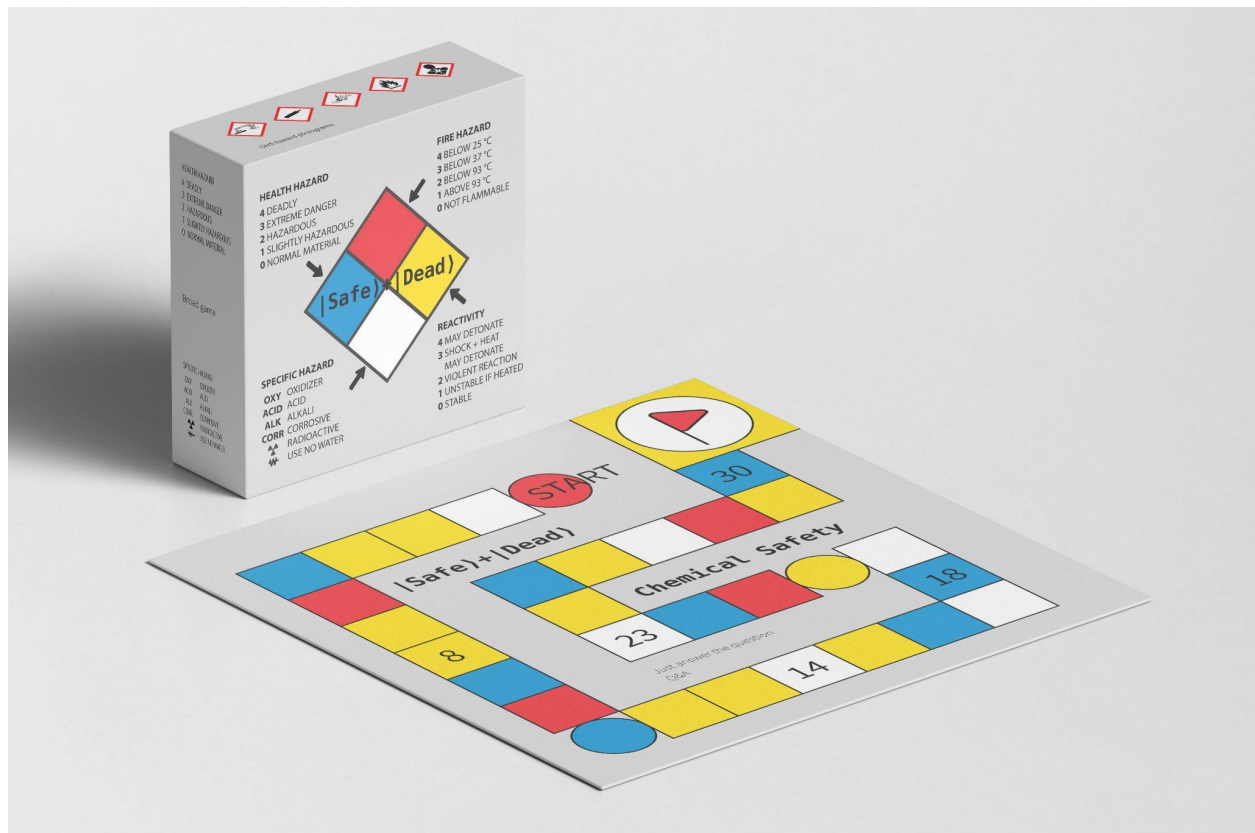


Bohan Li  
March 4, 2023  
UWP 001V

# Gamification Of Chemical Safety

## Genre 1: Conceptual Visualization of the Game



## Genre 2: Game Instruction of “ $|\text{Safe}\rangle + |\text{Dead}\rangle$ ” (“Safe Or Dead”)

### Background

AHHH! You (“victims”) got caught by Dr. Evil just before you are entering your lab sessions. How come? Several reasons have come into your mind: You

forgot to bring your lab coat and goggles, you never read a single word of the lab manual before lab, you copied the pre lab without reading it. Maybe none of them are truly applicable to your case. It's just that Dr. Evil wants to test you.

## Before the start of this game

“Victims” need to show their lab notebooks before the start of this game. If the pre-lab is already made in detail and this victim has been fully prepared for the lab (especially on personal protection equipment), the victim can be passed immediately by saying: “Dr. Evil never troubles a well-prepared student. Only science will.”

\*Killing time mode: When Dr. Evil is in killing time mode, no victim can be passed at the start of the game.

## Play

- All victims are started from the “START” point on the board. Victims must pick an object as a representation of themselves to start this test. All victims have 10 lives at the beginning.
- Turn Start
  - Move: The victims can only move one step forward in their turn.
  - Q&A: Pick the question from a stack of cards. The victim must start to answer the question within 15 seconds. When the answer is presented, flip the card to check with the reference answer. Whether the answer is fair or not is judged by Dr. Evil or by votes. If it is judged as no pass, then the victim loses one life.
    - \*Fresh victim mode: Each turn is not limited to 15 seconds. Each time can be up to 1 minute. Dr. Evil loves those victims who are new to the subject. New flesh! New blood! Dr. Evil will make every turn slow enough to enjoy the whole process.
    - \*Speedup mode: If the answer of the victim is passed, the victim can start its turn again.
    - \*Dr. Evil-is-here mode: Dr. Evil is present here. Dr. Evil can make up questions immediately out of space. There is no need to use a stack of corrodible cards to pick up questions.
    - \*Headless mode: Dr. Evil forgot to bring the game board. Everyone

must use its flesh to represent itself. Lines up! Game starts!

\*??? mode: some mysterious mode that even Dr. Evil did not come up with.

- Combo: if a victim answers the question correctly three times in a row, it is called a Combo. Boost the victim by three steps forward. Combo can be accumulated.
- Turn End: Now, it is the turn of the next victim.
- The End of a Cycle: One cycle ends when all victims either pass or not pass. At this time, start a new cycle with the remaining no-pass victims.
- The End of a Game: When there is no victim remaining, speak it out loud: “Dr. Evil never troubles a well-prepared student. Only science will.” The game ends. Dr. Evil can finally go to rest.

## How to Pass this Game

- Pass: If a victim survives at the end, then the victim passes the game. Dr. Evil never uses “win”, because no victim can “win” over Dr. Evil. Dr. Evil never accepts “win”.
  - \*Award mode: When Dr. Evil earns enough money, a passed victim can pick a sticker from the collection. If the victim shows a negative attitude towards the sticker, the victim cannot gain it.
  - \*Punishment mode: The victims who did not pass after 5 cycles will receive a punishment from Dr. Evil. What specific punishment would be used depends on the mood of Dr. Evil.
- If a victim does not pass, then the victim is “dead”. Pray for it and wait for the next cycle.

## Example Questions

- Q: Is it OK to perform experiments in the lab alone? A: NO. Never be alone in the lab.
- Q: What should you do if you want to drink water when you are in the lab? A: No drink of water is acceptable.
- Q: Is it OK to deposit toxic solutions into the drain? A: NO. One should never put toxic chemicals into the drain. Usually, a container is provided to store these wastes temporarily during experience.

- Lab related questions: For example, what chemicals will be used in this lab? What hazards would they cause? What are the safety measures for these chemicals?
- And more custom questions.

## Regulation

You may NOT

- Attack Dr. Evil. Dr. Evil is bulletproof.
- Use chemical substances as magic materials.
- Perform a real-world exhibition to go through dangerous cases.
- Read a handbook of lab safety at the time of answering questions.
- Apply this game in front of Roessler Hall. If so, either a 10-year-old Macbook, or a cat will die.

You may

- Disprove the bad humor of Dr. Evil.
- Speak aloud to report any mistake Dr. Evil had made previously to arouse the anger of Dr. Evil. Dr. Evil cannot attack you physically or magically.
- Read this game instruction to another person to laugh about how bad it is.
- Have fun!

## Explanation

- The goal of this game: Working safely in the lab is Dr. Evil's primary concern.
- The background of this game: The past efforts to raise the awareness of chemical safety were a lot. However, students may get bored of the traditional practices. "Dr. Evil" is then created to convert all boredom into FUN.
- There are various modes in this instruction. Modes are meant to be extra rules of this game. One can always think up their own modes.
- Proper personal protection equipment: It includes several aspects: eye protection, lab coat, shoes and long pants, gloves, hair. The common device for eye protection is safety goggles. Lab coats are required to be

full cotton. Long hair is recommended to be tied up or covered under the lab coat. There are other special protection equipment including lead shields for radiation and laser glasses. (Sveinbjörnsson, 2022, Chap 2)

- Idea credit: The idea of “Dr. Evil” originates from the storyline of the Bomb Lab in *Computer System: A Programmer's Perspective*.

## Disclaimer

Dr. Evil will NOT apologize for his poor sense of humor. Dr. Evil takes NO responsibility for any physical damage caused to victims or any damage caused by victims. Dr. Evil is NOT an excuse to be late to a lab session. A game with a bad sense of humor should NEVER be played in case of any emotional damage to victims, including sadness, awkwardness, boredom or other harm. The author of the game would feel guilty if anyone finds this game awkward or unplayable in real life. All characteristics and names are fictional. Please check the handbook of chemical safety, material safety data sheet, and chemical consults for professional suggestions and accurate descriptions. This is NOT a substitution of the lab safety manual and safety training. The author takes NO responsibility for any actual physical and mental harm. The author is NOT Dr. Evil.

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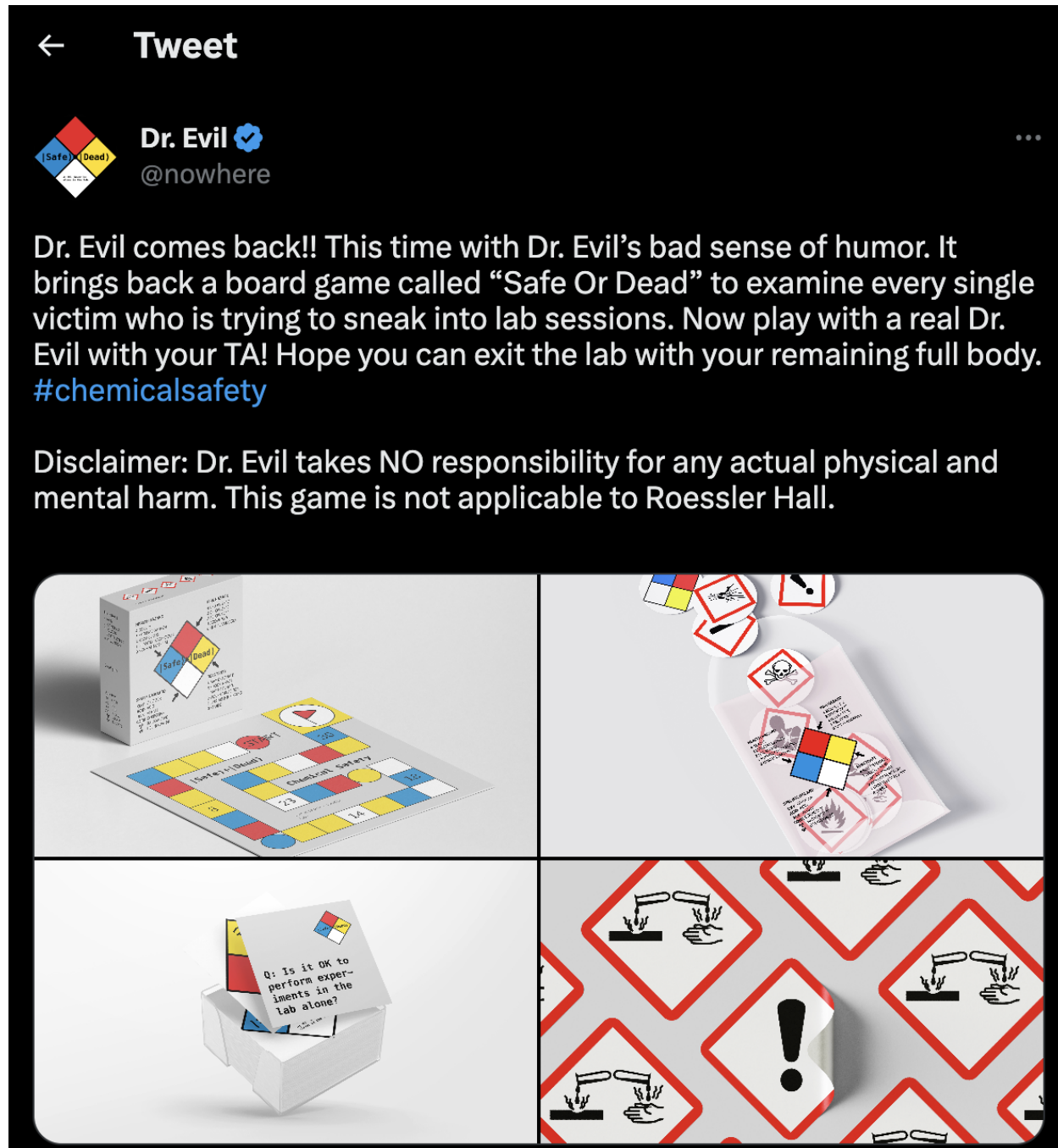
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## Cited Works

Sveinbjörnsson, B. R., & Gizurarson, S. (2022). *Handbook for laboratory safety*. Elsevier.

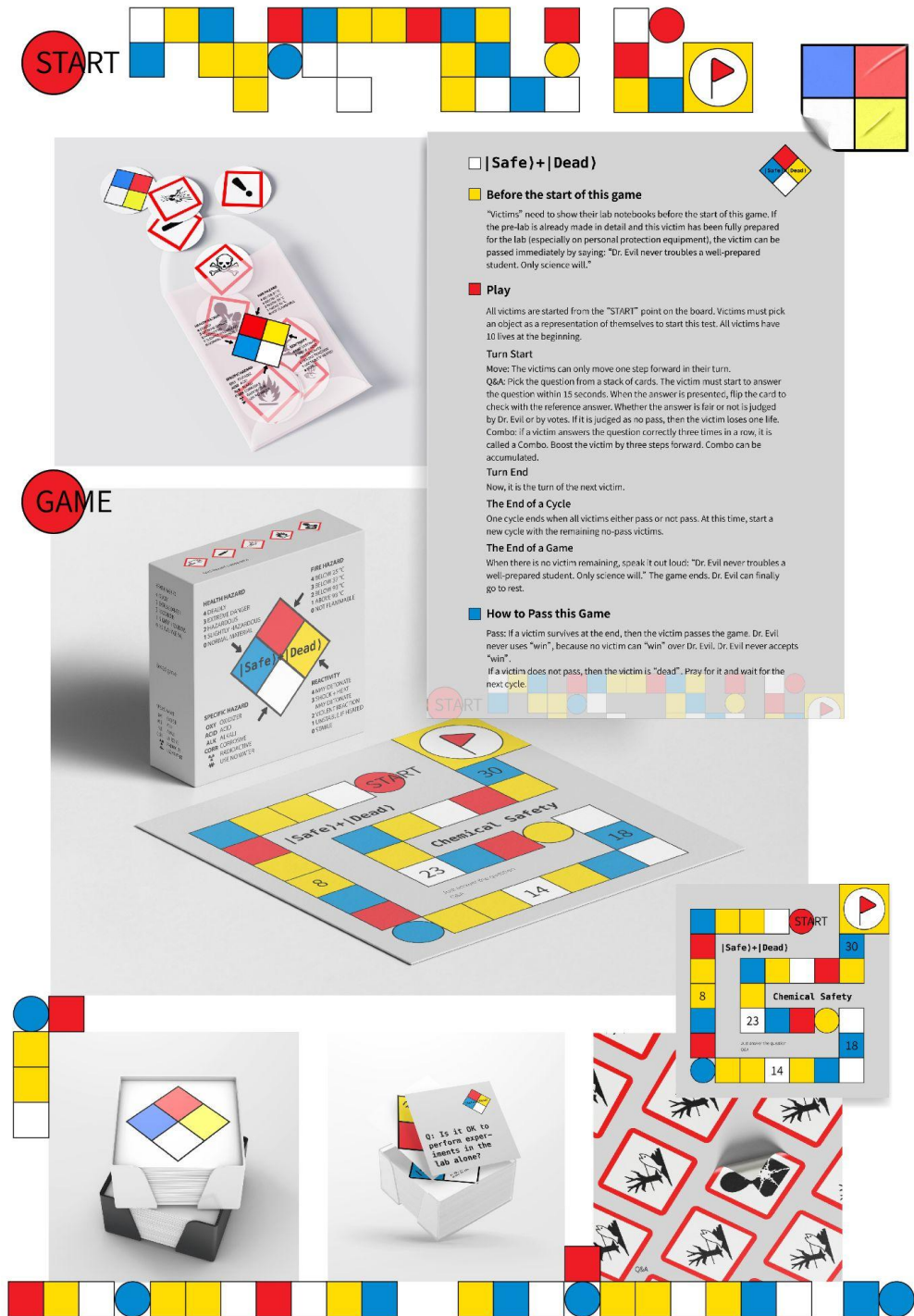
## Genre 3: Twitter Post



Dr. Evil comes back!! This time with Dr. Evil's bad sense of humor. It brings back a board game called "Safe Or Dead" to examine every single victim who is trying to sneak into lab sessions. Now play with a real Dr. Evil with your TA! Hope you can exit the lab with your remaining full body. #chemicalsafety

Disclaimer: Dr. Evil takes NO responsibility for any actual physical and mental harm. This game is not applicable to Roessler Hall.

# Genre 4: Poster





## □ | Safe⟩ + | Dead⟩



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#### Turn Start

Move: The victims can only move one step forward in their turn.

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#### Turn End

Now, it is the turn of the next victim.

#### The End of a Cycle

One cycle ends when all victims either pass or not pass. At this time, start a new cycle with the remaining no-pass victims.

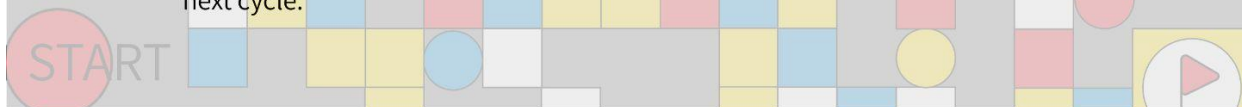
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If a victim does not pass, then the victim is “dead”. Pray for it and wait for the next cycle.



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