

# Lesson Plan

## Escape the Potential

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### Summary

**Subject:** High School Physics, AP/IB and all other venues

**Topic:** Quantum Mechanics, Applications of Quantum Mechanics

**Target Grade:** 10th and up

**Approximate Time:** 55-60 minutes

### Objectives:

- Students will understand some of the basic concepts of quantum mechanics
- Students will connect physics to real world applications and people
- Students will be able to teach concepts that they learn to others

### Materials

- Escape the Potential Game
- End of game formal assessment (optional)

### Implementation

#### Learning Context

- No knowledge of quantum mechanics is necessary.
- This lesson should be given after students have been familiarized with classical ideas of waves, position, etc.
- This game is a card game, so playing card strategy is the only help for students.

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## Motivation

Start lesson by saying that we are playing a game. Then watch video.

<https://www.youtube.com/watch?v=0sCEiSmjcuM> → start at 0.30

*5 minutes*

## Procedure

- Split students into groups of four *1-2 minutes*
- Ask one student from each group to grab a copy of the game *1 minute*
- Give students time to read directions as a group and ask for clarification *5-7 minutes*
- Have students play the game. As they play: *30 minutes*
  - walk around the room to answer questions
  - make sure everyone is participating
- Students clean up and one student from each group puts the game away *3 minutes*
- Ask students to say one thing they learned/found interesting *5 minutes*
- Hand out and have students complete exit ticket (if applicable) *5 minutes*

## Assessment Options

Formal assessment:

- Ask students to write down 2-3 concepts they learned
- Give students a short quiz with concepts you most want them to learn

Informal Assessment:

- Observe students as they play
  - Are they reading the card descriptions and explanations?
  - Can they explain concepts to their classmates?
- Look for engagement in all the students
- Note which students have legitimate answers for end of class discussion

## Differentiated Instruction

You know your students! Make sure you plan for students that might struggle with this lesson. Here are some examples of learners you can make sure to accommodate for:

- ESL students → student who might struggle with reading english
  - Some of the vocabulary might be difficult
    - Check in on them
    - Encourage group members to sound out difficult words together
    - Provide them with a ‘cheat sheet’ which has phonetic pronunciations
  - They might not feel comfortable reading aloud
    - You can assign one student from each group to read aloud the card descriptions
- Students with learning disabilities
  - Follow IEP and 504 plans
  - Check in with students
  - Make individualized differentiations depending on each student
- Student struggles in highly social situations → struggle with social aspect of the game
  - The day prior to giving this lesson, tell student the plan to give heads up
    - Explain what will be expected of everyone in the groups
  - Check in with student if they are showing signs of distress

