

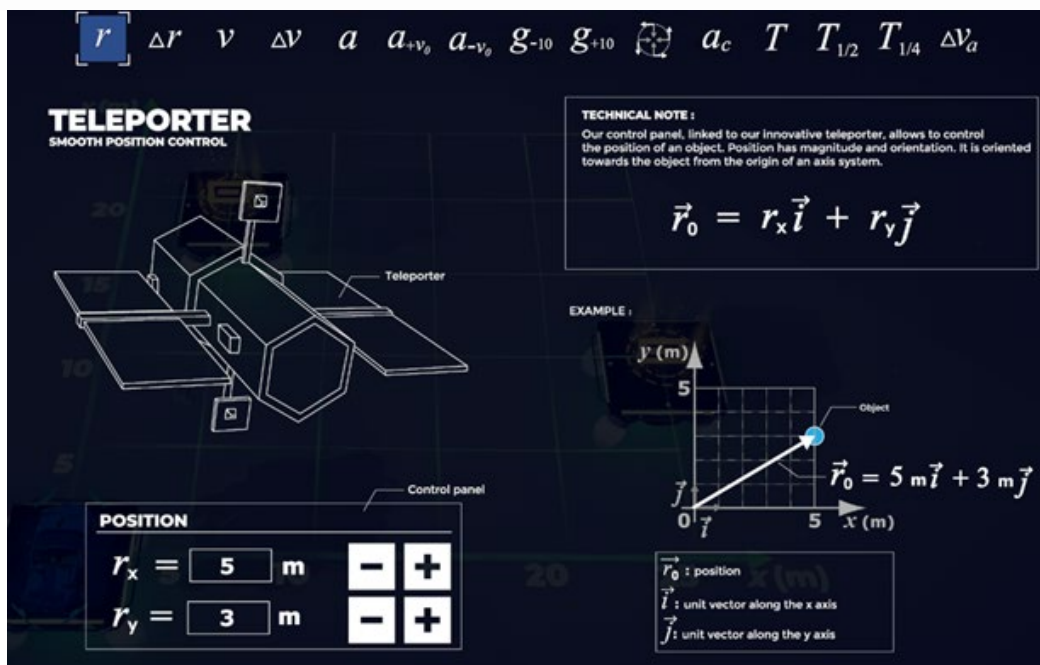


Studying kinematics with an electric car on the moon

Previous compulsory steps / Prior students' knowledge	Basic knowledge about the movement of objects
Learning objectives	Learning about position, displacement, relative position, speed, acceleration using axes Getting to know about Physical Philosophers
Subjects	Physics
Recommended Age	15-18
Material needed	Game: Space Tow Truck
Sequence duration	70-90 minutes
Individual or group activity	Group Activity
Skills to be developed (after learning goals)	Critical thinking, problem solving, creativity, communication, collaboration and teamwork, presentation skills.
Game price range	Free demo, or 8.19€ (for full game)
Extension / differentiation activities (at the end of the sequence)	This pedagogical sequence as a spectator could later be used as one player's activity so students could explore more and more about basic concepts in motion.

Step by step: how to implement the sequence

In this pedagogical sequence, an interesting and unique puzzle game about basic kinematics will be used. Kinematics is the main basis for understanding mechanics and it provides conceptual and mathematical foundations for almost all other areas of physics. This is why we think that a game concerning kinematics it is well worth to be presented and then be played by students at high school.



Snapshot I from the game: "The Space Tow Truck" (Creator: Eric Laflamme)

The car is based on Moon, and it needs to be moved to specific places to get some batteries. The aim of the game is to move a car to a specific position or/and through various positions in a specific way.

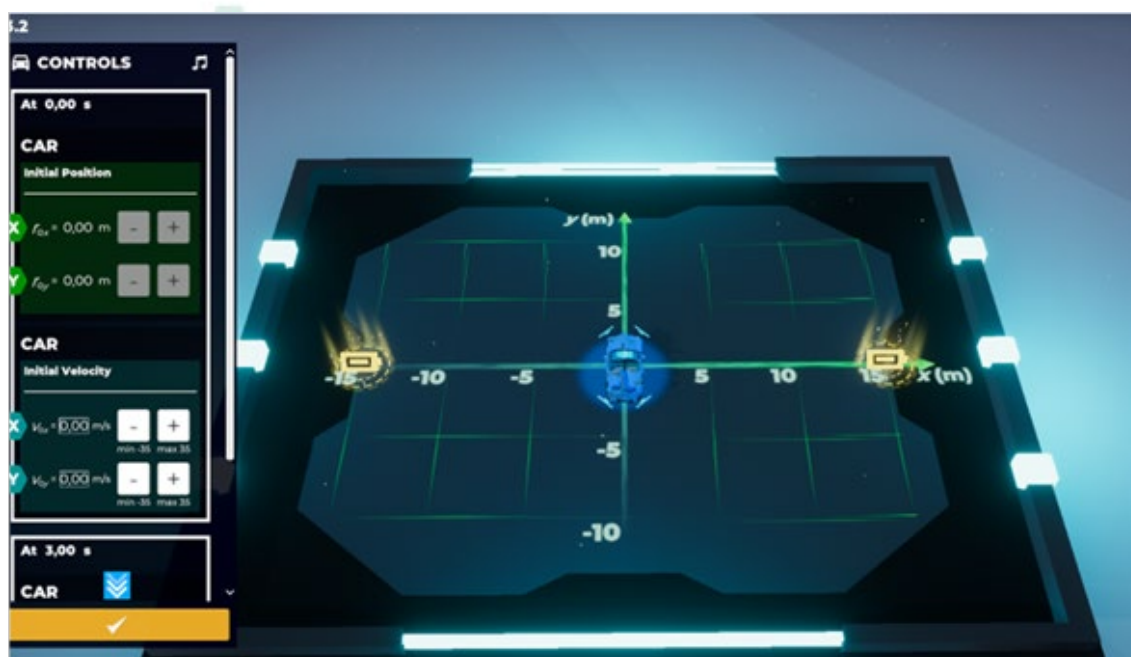
The pedagogical sequence may include the following steps:

- **Step 1 – Discussion in plenary (15 minutes)**

An introduction to the basic concepts in physics that the game refers to are presented and discussed in the classroom.

- **Step 2 – Discussion in plenary (15 minutes)**

The teacher shows how to use the game (the gameplay) and solves a first problem (like the one shown in the picture below).



Snapshot II from the game: “The Space Tow Truck”

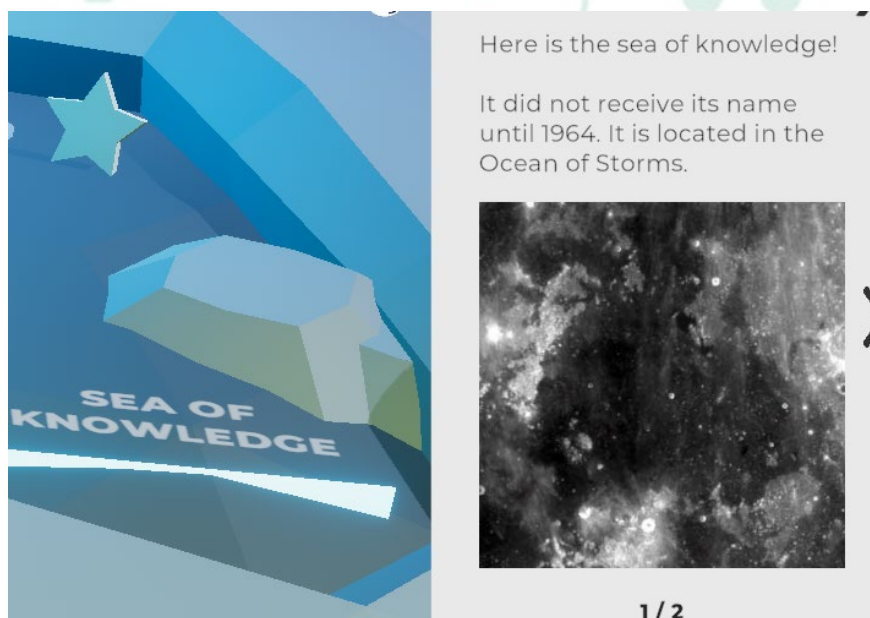
(Creator: Eric Laflamme)

- **Step 3 – Small group and class discussion (20 minutes)**

The teacher presents a new problem and divides the students into small groups (3-5 students). They discuss the appropriate solution and choose a person who will present the solution process verbally throughout the class for his/her group.

- **Step 4 – Small group and class discussion (15 minutes)**

The teacher resolves the problem according to the suggestions of the groups. In case none of the suggestions are appropriate, the teacher will resolve the problem. After solving the problem, the teacher and the students discuss the physics behind the solution and why the answers of some groups of students were right or not. In addition, you can discuss the historical data referring to the moon or to the basic physics' concepts of the level that presented to the game during playing. The process starts again with a new level/problem.



Snapshot III from the game: “The Space Tow Truck”
(Creator: Eric Laflamme)



Snapshot IV from the game: "The Space Tow Truck"

(Creator: Eric Laflamme)

Note: Each level of the game is a different problem in kinematics. The teacher can choose the ones that are more appropriate for his/her students.

Resources

Getting the game

https://store.steampowered.com/app/1273600/SPACE_TOW_TRUCK_ISAAC_NEW_TONs_Favorite_Puzzle_Game/

Information

All screenshots used in this lesson were taken from SPACE TOW TRUCK, Eric Laflamme (2021)