Universe sandbox Tutorial – VEGA Teaching Scenario

Topic: A tutorial lesson to get the most out of Universe Sandbox 2 game.

Subject(s): Science, Physics

Age / Grade: 6th grade and up

Short description of the game:

Universe Sandbox is an interactive sandbox gravity simulator video game and educational software. Using Universe Sandbox, users can see the effects of gravity on objects in the university run scale simulations of the Solar System, various galaxies or other simulations, while at the same time interacting and maintaining control over gravity, time, and other objects in the universe.

Introduction to the scenario (*incl. possible applications, alternatives, risks, and possible challenges*):

A simple scenario about astronomy and the game itself. A good introduction to get the most out of the game. Please make sure the game is installed and works. Please also open the power point provided to see the full walkthrough.

Selection of learning outcomes from the Finnish Curriculum:

T1 generates and maintains the student's interest in the environment and the study of environmental studies, and helps the student experience all areas of environmental science as relevant to him/her

T5 guides the student to plan and carry out small studies, make observations and measurements in diverse learning environments using different senses and research and measurement tools

T6 guides the student to identify cause-and-effect relationships, draw conclusions from their results and present their results and research in different ways

T11 guide the student to use information and communication technology in the acquisition, processing and presentation of information and as a means of interaction responsibly, safely and ergonomically

T13 guide the student to understand, use and make different models that can be used to interpret and explain people, environment and their phenomena

Number of students: Two students per one computer / device.

Duration (estimated time/number of lessons): One 45 minute session.

Prerequisites (*necessary materials and online resources*):

Please see the powerpoint and make sure the game works (universe sandbox 2)

The main part of the scenario (number of lessons): 1 lesson

Part one

Preparations: The lesson is split into three phases: Theory, play and debrief.

Please open the powerpoint provided.

Theory phase: Discuss the topics listed to warm-up to the topic of astronomy.

Play phase: Briefly check the 'how to play' instructions on the slides.

Please instruct your students to play through the tutorial in the game.

For fast students, see slide 12 for differentiation and encourage them to experiment.

Debriefing: Share and discuss on the slides.

Please discuss the topics provided on the slides. Presenter notes will provide the answer to the questions if needed. Feel free to have a free discussion with the students. They might also have interesting ideas on how to utilize the game in school.

Evaluation of the scenario with pupils

Example

A tool to evaluate the process of teaching not to impact the students' grades.

To be used optionally by the teacher.

ASSESSMENT

Student evaluation rubric				
Knowledge content	1	2	3	4
Information recall	Student can't recall information covered in game	Student can recall some information covered in game	Student can recall most information covered in game	Student can recall all the information from the game well
Transfer	Student can't connect the information in game to information on books or in other medias	Student can transfer some information from the game to other medias	Student can transfer majority of information from the game to other medias	Student can connect the information in game very well to contents in other medias
Skills	1	2	3	4
Problem-solving	Student did not try to solve problems in game / during activity	Student was somewhat active in solving problems during the activity	The student worked rather actively on solving problems during class.	Student worked very actively on solving problems during class
Collaboration	Student was not able / willing to collaborate with others.	The student participated, but was not particularly active in collaboration.	Student was actively collaborating while working.	Student was very actively collaborating while working.
Creativity	Student did not actively consider / provide creative solutions to tasks or challenges	Student provided some creative ideas and solutions during the activity	Student actively considered / provided creative solutions to tasks or challenges	Student very actively considered/provided creative solutions to tasks or challenges
	1	2	3	4

Exercise completion	Student was not able to complete the tasks in the game	Student was able to complete some of the tasks in the game	Student was able to complete most of the tasks in the game	Student was able to complete all (or nearly all) tasks in the game
Engagement	Student was not engaged during the class	Student was slightly engaged during the class	Student was engaged during the class	Student was very engaged during the class

For students - more for evaluating the game itself. Most useful when experimenting

Student self-assessment rubric (includes game/scenario assessment)				
	1	2	3	4
Clear goals	I didn't understand what I was supposed to do in the game.	I somewhat understood what I was supposed to do in the game.	I knew what to do in the game.	I knew exactly what to do in the game.
Challenge level	The game was so hard that I felt frustrated.	My skill and game's difficulty were in balance.	The game didn't provide me with too much challenge.	I felt bored, the game was too easy.
Feedback	The game didn't provide me any feedback	The game provided me some feedback	The game provided me a lot of feedback	The game provided all the feedback I needed.
Concentration	I wasn't able to concentrate on the game.	I was able to somewhat concentrate on the game.	I was able to almost fully concentrate while playing.	I was able to fully concentrate while playing.
Completion	I wasn't able to complete the tasks in the game.	I was able to complete some tasks in the game.	I was able to complete almost all tasks in the game.	I was able to complete all the tasks in the game.
Learning	I didn't learn anything.	I did learn something from the game.	I feel that I learned quite a few things from the game.	I feel that I learned a lot from the game.
Fun	I didn't like playing the game.	I had some fun playing the game.	Playing the game was fun.	Playing the game was a lot of fun.