Astronomine worlds

Starts lesson plan

2024

https://astronomine.erasmusplus.website/

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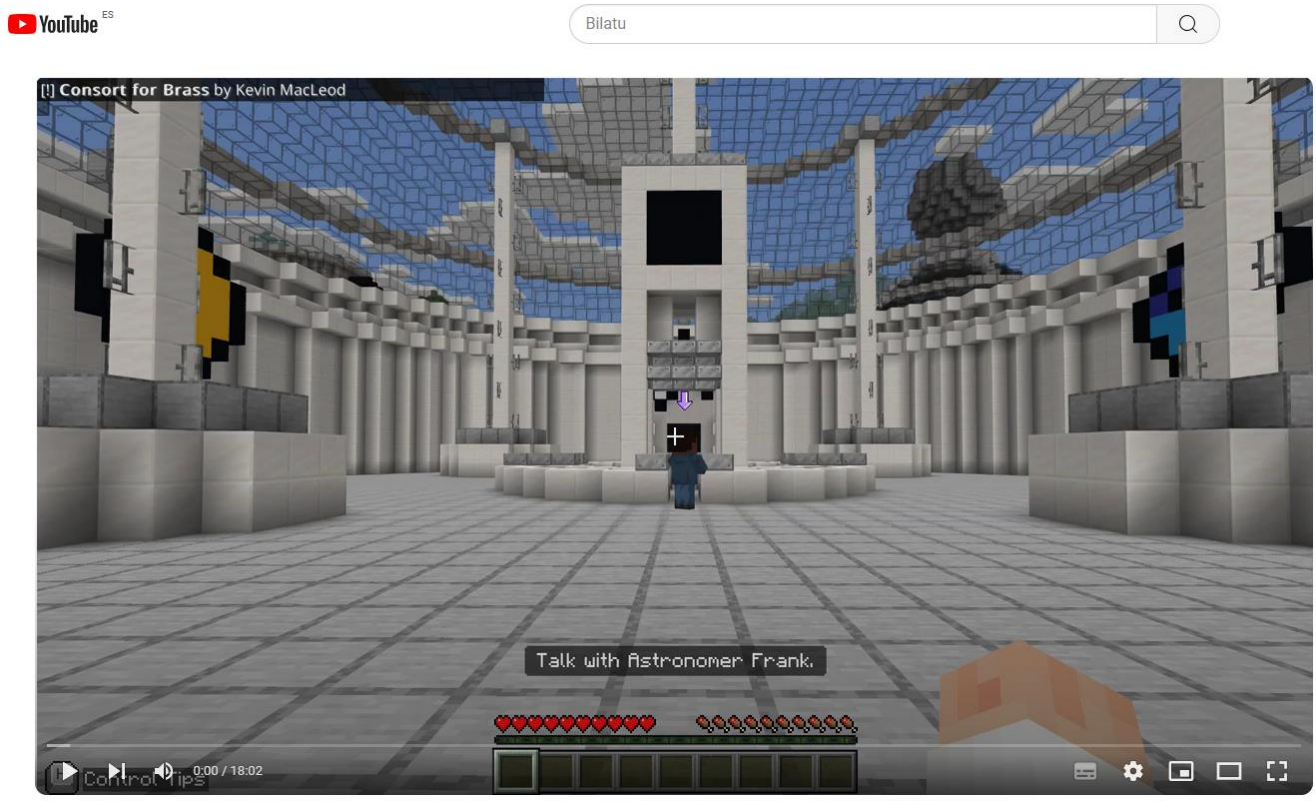
Contents

Disclaimer: This lesson plan is designed to be used alongside the teacher's guide developed in the Astronomine project, which is available here in PDF: https://astronomine.erasmusplus.website/teachers-manual

Promotional video here:

https://www.youtube.com/watch?v=Fp3SH0grwmk



Before the lesson

1. Download and install Minecraft: Education Edition on all the students' devices that will be used for the workshop. Ensure these devices are running Windows 7 or later, macOS, iPadOS, or ChromeOS.
2. To import the world we will be using in the workshop, follow these steps after opening Minecraft: Education Edition with your Office 365 account:
    1. Click on "Play."
    2. Select "Import."
    3. Choose the Astronomine file.
    4. Once you see the message "Level import completed," go to "View My Worlds," and the world will appear.
    5. Click on the Astronomine world and wait for the prompts to load.

Connecting the *Stars* World to the Teacher's Guide

Stars World: Lesson Guide for Primary Teachers

The *Stars* world is dedicated to exploring the science of stars, their life cycles, and the broader structure of the universe. In this Minecraft world, students will engage with concepts related to stellar formation, evolution, and cosmic phenomena such as galaxies and nebulae.

1. Learning Objectives

This world introduces primary students to the study of stars, galaxies, and the universe. Students will:

- Learn about the life cycle of stars, from their birth to their death as supernovae.
- Understand the basic structure and types of galaxies, including our own Milky Way.
- Explore nebulae and other celestial phenomena in space.
- Develop an appreciation for the vastness and complexity of the universe through visual modelling.

2. Key Activities

Activity 1: Life Cycle of Stars
(Reference: Guide Chapter 7.9 - Stars and Nebulae)

- **Objective:** Students will learn about the stages of a star's life, including birth, adulthood, and death as a supernova.
- **Minecraft task:** In Minecraft, students will build representations of the different stages of a star's life cycle, including the formation of protostars, main-sequence stars, and supernova explosions.
- **In-class:** Teachers can introduce the concept of the stellar life cycle, explaining how stars are born in nebulae, live for billions of years, and end their lives in spectacular explosions. Students will create models in Minecraft that represent each stage, visualising the transformation of stars over time.

Activity 2: Building a Model of the Milky Way and Other Galaxies
(Reference: Guide Chapter 7.10 - Galaxies and the Universe)

- **Objective:** Students will explore the structure of the Milky Way and other types of galaxies.
- **Minecraft task:** Students will construct models of different types of galaxies, including spiral, elliptical, and irregular galaxies, within Minecraft. They will model the structure of the Milky Way, showing the location of the solar system within it.
- **In-class:** Teachers can discuss the different types of galaxies in the universe and explain that the Milky Way is our home galaxy. Students will use Minecraft to build galaxy models, helping them to visualise the shape and scale of these enormous systems of stars.

Activity 3: Exploring Nebulae and Stellar Phenomena
(Reference: Guide Chapter 7.9 - Stars and Nebulae)

- **Objective:** Students will learn about nebulae as the birthplaces of stars and other fascinating phenomena in space.
- **Minecraft task:** Using blocks and special effects in Minecraft, students will create nebulae models and simulate the processes that lead to star formation within them.
- **In-class:** Teachers can explain what nebulae are and how they play a crucial role in the formation of stars. Minecraft will allow students to build colourful, cloud-like structures that represent nebulae, demonstrating how stars form from these cosmic nurseries.

Activity 4: Are We Alone? The Search for Life in the Universe
*(Reference: Guide Chapter 7.11 - Are We Alone?)**

- **Objective:** Students will explore the idea of extraterrestrial life and what conditions are necessary for life to exist in the universe.
- **Minecraft task:** In Minecraft, students will create models of exoplanets and simulate environments that could potentially support life. They will design planets with features such as water, atmosphere, and sustainable ecosystems.
- **In-class:** Teachers can introduce the concept of habitable zones around stars and the ongoing search for exoplanets that might support life. In Minecraft, students will design their own “alien worlds” and discuss the conditions needed for life to thrive in different parts of the universe.

3. Teaching Suggestions

- **Link to visual aids:** Use diagrams and videos that show the life cycle of stars, the structure of galaxies, and nebulae before allowing students to recreate these in Minecraft. This helps students understand the concepts before building them.
- **Group projects:** Assign groups of students to work on different stages of a star’s life cycle or various types of galaxies and nebulae. This encourages collaboration and allows for deeper exploration of each topic.
- **Relating stars to daily life:** Help students connect these cosmic concepts to familiar experiences, such as seeing the stars at night or recognising the Milky Way, to make the subject more relatable.

4. Evaluation

- **Minecraft creations:** Evaluate the students’ ability to model the life cycle of stars, galaxies, and nebulae accurately in Minecraft. Check for understanding by asking students to explain their models.
- **Class participation:** Assess students based on their ability to explain the concepts behind their Minecraft builds, such as the stages of a star’s life or the conditions necessary for life on other planets.
- **Problem-solving:** Encourage students to refine their models by thinking critically about how they can more accurately represent complex astronomical phenomena in Minecraft.

Starting Point: Balloon Room

The game starts in a room where you must pop the balloons.

- Action: Meet the NPC, who will ask you to build a key consisting of two pieces.

- Action: Assemble the key and unlock the door leading to the workshop.

Sun Stage

After moving into the next room, Astronomer Frank will give you your ID and direct you to the sun.

- Action: Enter the sun and pass through the labyrinth.

- Action: Interact with NPCs who will ask quiz questions to proceed.

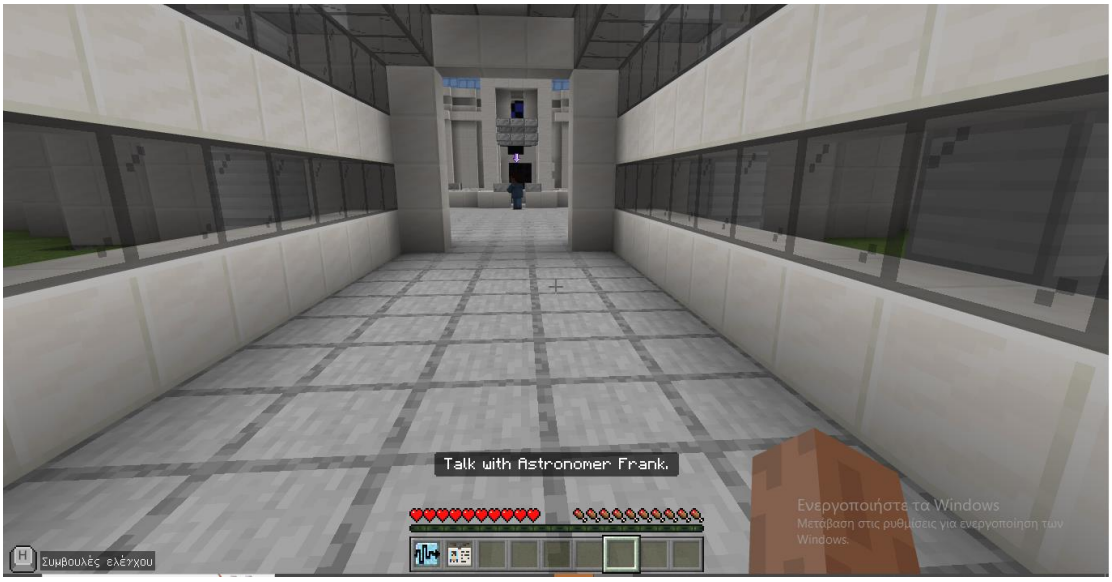
Proton Collection Stage

After the labyrinth, collect protons and place them in a box to advance by determining the age.

- Action: Use the protons to progress.

Lab and Planet Stage

In the lab, put one of two materials into a machine to generate planets.

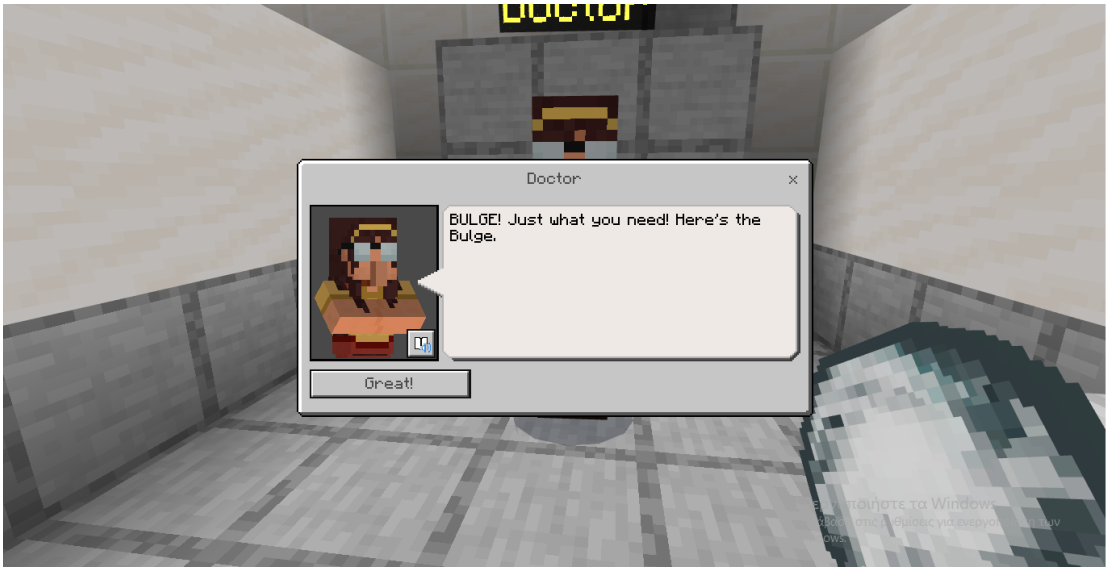


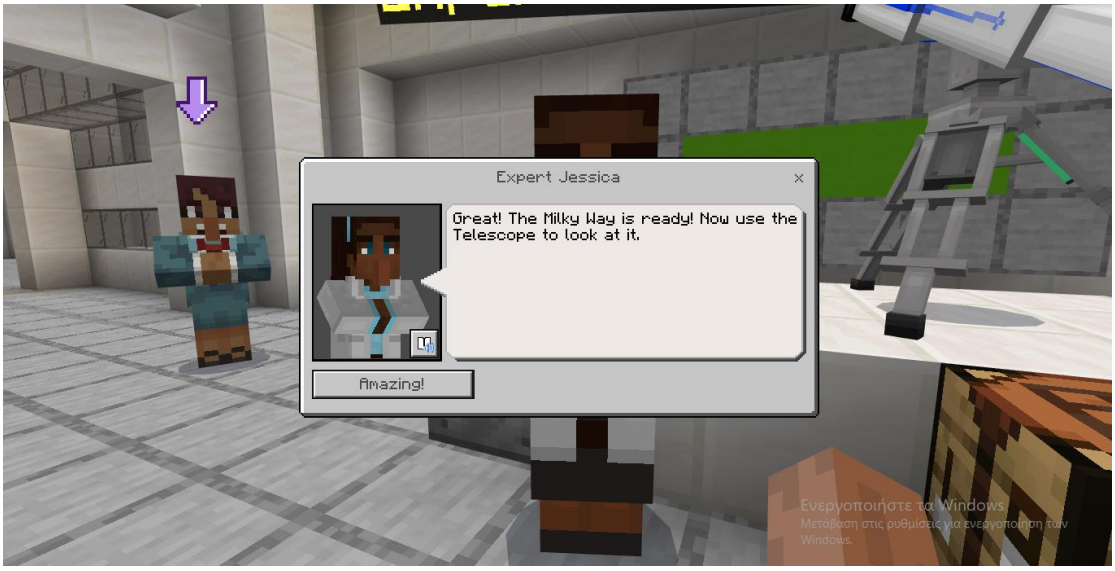
- Action: Place the planets in the computers following the instructions from Astronomer Frank.

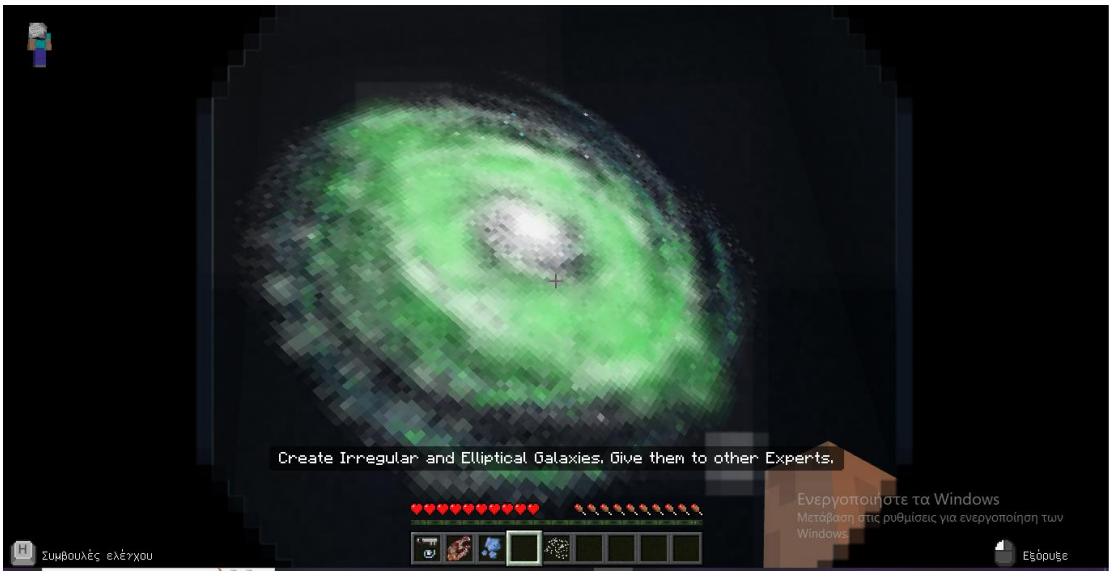
- Action: Talk to Astronomer Laura to advance.

Galaxy Building and Quiz Stages

After talking with Astronomer Laura, you will receive quizzes from several doctors.







- Action: Correctly answer the quizzes to receive stars.

- Action: Use the stars to build the galaxy with the astronomer's help.

Gas Collection and Stellar Dust Stage

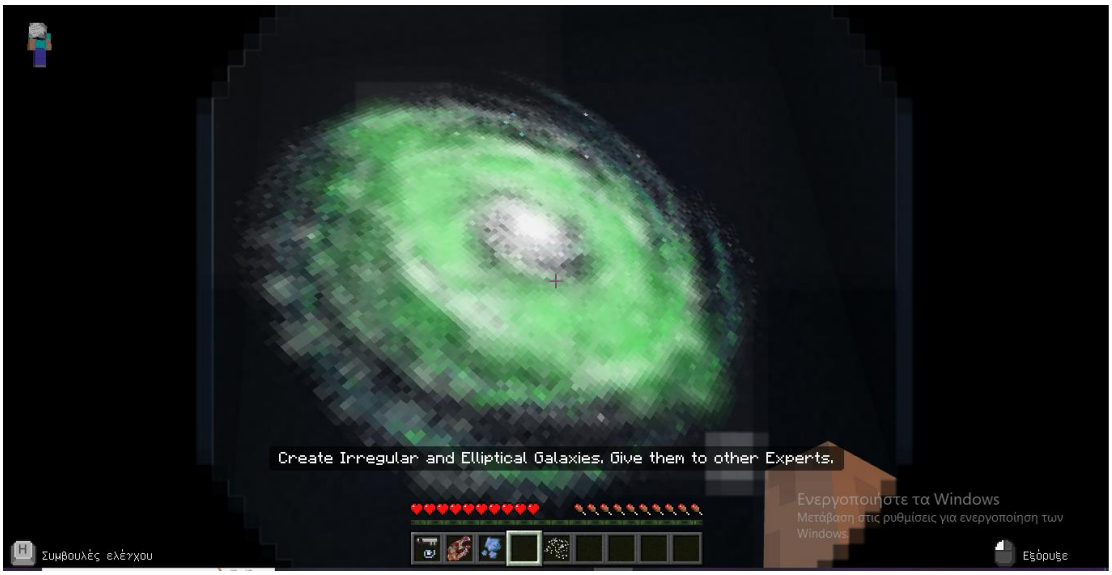
To obtain gas, complete a puzzle, and for stellar dust, search inside chests.

- Action: Solve the puzzle and search for the dust to continue.

Galaxy Building and Solar Systems Stage

Build the elliptical and irregular galaxies with the help of the astronomers.

- Action: View the galaxies through the telescope.



- Action: Answer Astronomer Emma's quiz to earn Earth.

Place the planets in the correct positions of the solar system and repeat this for each solar system.

- Action: After completing all tasks, talk to Astronomer Emma to finish the game.