

Time to fly up to space and land on new planets!

Previous compulsory steps / Prior students' knowledge	None
Learning objectives	Familiarize students with mechanisms of construction, 3D printing and engineering processes Learn about chemical substances
Subjects	Technology, Chemistry, Engineering
Recommended Age	10-14
Material needed	PCs that can run the game Astroneer
Sequence duration	135-180 minutes
Individual or group activity	Individual and Group Activity and Plenary
Skills developed	Collaboration & teamwork, Communication, Creativity, Critical thinking, Planning, Problem solving
Price range of the game	<30€ (27.99€)
Similar games to use with the approach of the sequence	Older students can use Satisfactory

Step by step: how to implement the sequence

In this pedagogical sequence, students will use a cooperative engineering game which is called: "Astroneer". The game is a beautiful and relaxing simulation of a new, undiscovered planet settlement. Like all cooperative games, Astroneer pushes the

players to work together to achieve common goals. The purpose of the game is to create conditions for life and development on a new planet.

- **Step 1: Explain the concept and the aim of the game to students (20 minutes)**

The educator explains the basic concepts of the game to students. Four “Astroneers” have landed on a new planet (one of seven) full of resources, in order to colonize it. They will cooperate in order to construct a base suitable for sustaining life using any available resources around them and crafting new tools.

Students will play the game in groups of 4. No roles are inherently suggested in the game. That is, there are no predefined roles for each player. One suggestion is the following, but each educator can create different roles tailored to their own approach. Each student assumes one of the following roles: Chief, Science advisor, Engineer, Resources Manager.

- The Chief is responsible for the team's movements on the surface of the planet and the assignment of roles thereafter, as well as for emergency decisions concerning the safety of the team. They consult, where appropriate, all the rest of the team to make the appropriate decisions. The role of leader(/chief) can be assigned to a student who has experience in this or similar games.
- The Scientific Advisor studies the planet's resources and looks at ways to use them creatively. They use the “research catalogues”, working closely with the Resources Manager and with the Engineer to know the team's needs in terms of construction.
- The Engineer is in charge of the constructions and new tools and cooperates with everyone else for this purpose.
- The Resources Manager must know what the team has in terms of materials and structures, and report to the leader and the engineer.

Of course, the team will discover many other tools, materials and structures later and will have to use them, taking on new additional responsibilities.



Figure 1. Snapshot from the first moments of the game (“Astroneer”, System Era Softworks, 2016)

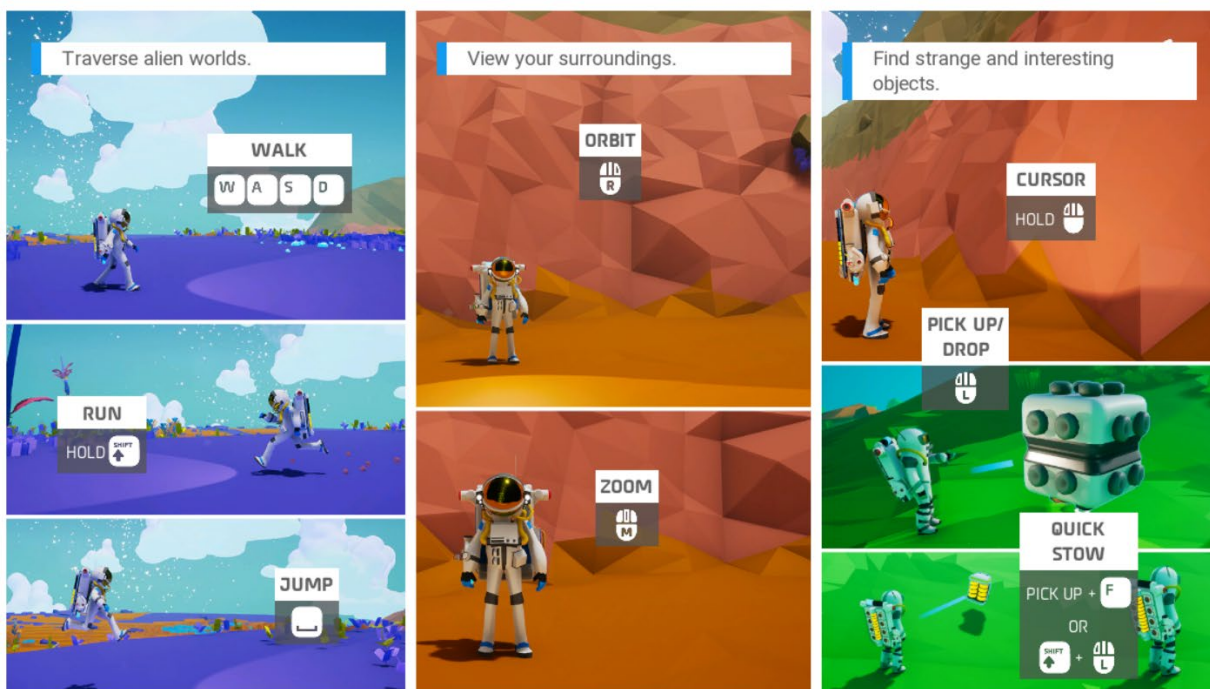


Figure 2. Snapshot of an in-game tutorial (“Astroneer”, System Era Softworks, 2016)

- **Step 2: Explain the gameplay to students through videos in the classroom (25 minutes)**

The educator explains the gameplay through videos in the classroom, paying special attention to the ways of communication and cooperation presented in the following videos:

- [Astroneer - #1 - Co-op Space Madness! \(4-Player Astroneer Gameplay\)](#) in Stumpt channel
- [Astroneer - #2 - Falling Through Worlds \(4-Player Astroneer Gameplay\)](#) in Stumpt channel

Note: The educator must see the videos and choose the parts they would like to use, according to their students' needs.

- **Step 3: Students play the game in the ICT laboratory (45 minutes)**

The educator divides the students into groups of four and lets them choose the different roles they will play. The role of chief should be given to experienced gamers. The four students in each group either sit in consecutive and close positions or, better still, wear headphones with a microphone and sit in remote positions to emulate the process they will follow later at home.

Next, students start playing and getting familiarized with their roles. They should all start from the first planet, but they can choose one of the five first levels (easy to medium levels).

During the game, the teacher intervenes minimally by leading the students within their assigned roles and noting any misbehaviour, then ends any arguments and pays attention to politeness and mutual support.

- **Step 4: Students play the game at home in groups of four (1-3h)**

Now students should play the game at home for ?? time, in groups of four (remotely). Players must use resources in an innovative way, they must work together effectively without loss, take on roles, learn new ways and methods, learn new concepts, materials and chemicals, and as is easily understood through all of the above, cultivate a range of skills.

During the game, students should record the materials they used and the constructions they created in order to have a discussion later in class. This is easily could be helped by game screenshots.

- **Step 5: Reflect in plenary in the classroom (30 - 75 minutes)**

In class, everyone will talk about their experiences of playing the game and working with their classmates. They will talk about the procedures they followed, make special references to resources and construction procedures. To support the previous, they will use the screenshots they took during the game.

They will also mention the chemical elements they encountered during the games and if, in their opinion, there are any that exist here on Earth.

- **Step 6: Educator sums up (15 minutes)**

Finally, the educator sums up the cooperation procedure, the constructions that were created and the resources the teams used to succeed in the game. They can use the snapshots of students if they find it necessary.

Getting the game:

<https://store.steampowered.com/app/361420/ASTRONEER/>

References:

Astroneer - #1 - Co-op Space Madness! (4-Player Astroneer Gameplay). (2016, December 16). [Video]. YouTube. https://www.youtube.com/watch?v=eFJoY3_9L6g

Astroneer - #2 - Falling Through Worlds (4-Player Astroneer Gameplay). (2016, December 21). [Video]. YouTube. https://www.youtube.com/watch?v=gBaqJ-wFsIM&ab_channel=Stumpt