

OUTSTE(A)M Games and Toys

AREcoRescue Game

Title

AREcoRescue

Creator

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Summary

AREcoRescue is an outdoor learning game with augmented reality, in which pupils become guardians of the planet. Their mission is to explore the real environment, collect virtual resources, clean up virtual polluted areas, and restore ecosystems, all while being outdoors and playfully learning about biodiversity, sustainability, and climate change.

Using mobile devices with GPS and camera, pupils physically move around their environment to discover natural resources and polluted areas. Each resource they find in augmented reality includes a brief educational explanation, adapted to the pupils' age (3-8 years), with information about its ecological importance. The elements may be related to reforestation (trees, leaves, herbs, mushrooms), biodiversity (animals, nests, insects), or clean energy and waste management (windmills, recycling, etc.).

Keywords

Biodiversity, Augmented reality (AR), Sustainability, Climate change, Environmental education

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Overview

Subjects	Natural Sciences, Technology, Engineering, Mathematics, Art, and Interdisciplinary Learning
Topics	Environmental education, biodiversity, sustainability, climate change, and outdoor exploration
Age of Pupils	3-8 years
Indicative preparation time	30 minutes
Indicative game time	30–60 minutes
Materials	○ Suitable clothing and footwear for free movement while being in outdoor learning environments. ○ Mobile device with GPS geolocation and Internet connection.
Guiding comments	○ Before starting to play, make sure the area is safe, free from hazards such as nearby roads, uneven terrain, or obstacles. Check that the ground is free of dangerous objects and that the weather conditions are suitable for the activity, avoiding storms or extreme temperatures. Ensure that all pupils are supervised by responsible adults throughout the activity. ○ It is essential that, both during the game and in our daily lives, to respect the environment. By taking care of nature, we protect the essential resources we need to live, such as air, water, and food, and help maintain the balance of ecosystems. Remember that every small action counts, and if we all collaborate, we can ensure a healthier and more sustainable future for everyone.

Game Objectives

- **Educational:** The aim of this game is to raise pupils' awareness about environmental conservation and its importance, biodiversity, and the impact of climate change. It also demonstrates the importance of teaching sustainable practices such as reforestation, recycling, and the use of clean energy. Through exploring their surroundings, pupils develop scientific skills such as observation and problem-solving, while also understanding the water cycle and ecological balance. In addition, the game fosters awareness of climate change and the need to restore damaged ecosystems.

- **Playful:** The game promotes physical activity and social interaction, motivating pupils to work as a team to achieve objectives. Using a points and achievement system, pupils remain motivated and engaged while exploring their outdoor environment. Gamification makes learning about the environment fun, and direct interaction with nature increases participants' curiosity and commitment.

Game Plan (Step by Step)

Download the AREcoRescue app by visiting this link: <https://n9.cl/y804vg>, on the mobile phone or tablets that are to be used while playing this game.

Divide pupils in groups and give each group one device with the AREcoRescue app installed. Each group should also have a responsible adult.

Check that the GPS, location services and wifi are enabled on the devices. Then start the game by opening the AREcoRescue app.

On the home screen, select the age to adapt the game content to the pupils' level of understanding and choose the preferred language (Spanish, English, French, German).

The game will explain that your mission is to restore damaged ecosystems and clean polluted areas by collecting natural resources, such as trees, leaves, flowers, and removing waste.

As you progress in the game, you will learn about biodiversity, climate change, and sustainability.

Begin exploring your surroundings physically (this could be a park, garden, or natural area). Augmented reality (AR) will help you see resource icons (such as trees, flowers, etc.) on the device screen.

Walk towards the icons that appear on the screen. These icons represent natural resources that you can virtually collect.

When you find a resource, such as a tree or flower, a question or educational challenge related to that resource will appear.

Answer the questions or complete the educational challenges. By doing so, you will earn points and educational feedback to help you learn more about the resources.

During the game, you will also see polluted areas that need cleaning. This could involve collecting virtual trash, such as cans or plastics.

To clean a zone, click on the virtual waste on the screen and collect it. This action will also earn you additional points and teach the importance of recycling and waste reduction.

Each time you find a new resource or complete a challenge, you will receive educational feedback reinforcing what you've learned, such as information on the ecological impact of the resource.

The game ends when 30 minutes have passed (depending on the duration agreed upon by the pupils).

Variants and Adaptations

- Divide the pupils into larger teams and assign specific roles within the group (e.g., explorer, collector, cleaner). This fosters cooperation and allows everyone to actively participate.
- Replace augmented reality with printed maps where pupils must find specific places or resources in a designated area.
- If the game takes place in an urban environment, local parks, squares, or green spaces can be identified for exploration. Pupils can search for urban resources (such as recycling bins or community gardens) and learn about sustainability in urban areas.
- For pupils with additional support needs, accessibility options can be offered, such as subtitles or audio descriptions for pupils with visual impairments. The challenges can also be modified to be more inclusive in terms of motor or cognitive abilities.

Didactic Keys for Teachers and Families

BEFORE CARRYING OUT THE ACTIVITY

- **Prepare the environment and participants:** Ensure that the play area is safe and suitable for the activity by checking that the terrain is accessible and free of hazards. Both teachers and families can have a pre-activity conversation with the pupils about the importance of caring for the environment and how the game will help them learn about biodiversity, sustainability, and the impact of our actions on the planet. This pre-conversation motivates active participation and helps pupils understand the educational purpose of the game.

DURING THE ACTIVITY

- **Guide and accompany:** While pupils explore and perform tasks in the game, an adult should accompany them. Encourage cooperation and teamwork by motivating them to share roles

and collaborate to achieve the game's objectives. It's important to ask reflective questions such as "Why is it important to collect this resource?" or "What happens if we don't restore this area?". This helps pupils connect with sustainability concepts while having fun.

- **Encourage reflection:** While playing, pupils should be encouraged to think critically about the impact of their actions on the environment.

AFTER THE ACTIVITY

- **Reflection and evaluation:** After the game, both teachers and families should reflect together on what was learned. This may include a group discussion where pupils share their experiences, challenges faced, and solutions found. Families can continue the conversation at home, asking pupils what surprised them the most and how they can apply what they learned in their daily lives.
- **Reinforce sustainable habits:** Take the opportunity to apply what was learned in the family environment by implementing small sustainable actions like recycling, saving water, or taking care of the garden. Additionally, as teachers, they can integrate these lessons into other curricular areas, linking environmental care with scientific, mathematical, and civic concepts.

Assessment

CONTINUOUS AND FORMATIVE EVALUATION

- Observe each pupil's participation during the game. Record how they engage in resource collection tasks and the cleaning of polluted areas.
- Record how they apply the environmental concepts learned, such as biodiversity, the water cycle, and sustainability, while interacting with the environment.
- Assess motor coordination and the use of technological tools, such as GPS and augmented reality, and how they adapt to space to find and collect resources efficiently.

TEAMWORK AND SOCIAL SKILLS EVALUATION

- Analyze how pupils collaborate, communicate, and solve problems within the group to achieve the objectives of the game, such as ecosystem restoration or cleaning polluted areas.

- Observe the decision-making process, leadership, and support between teammates when dividing roles such as explorers, collectors, and cleaners, and how they manage challenges as a team.
- Encourage cooperation and observe how each team member actively contributes to teamwork to achieve the common goal of restoring the environment.

POST-ACTIVITY REFLECTION

Ask guided questions for pupils to express what they have learned:

- "What ecological resources did you find, and why are they important for the environment?"
- "How did your team contribute to ecosystem restoration, and what strategy worked best?"
- "What did you learn about the importance of cleaning polluted areas, and how does this affect biodiversity?"
- "How would you apply what you learned in your daily life to take better care of the environment?"

Comments for Teachers

- It is recommended to play in a spacious, safe, and supervised area.
- Encourage active learning, the development of critical thinking, the use of educational technology, and reinforce environmental values.
- AREcoRescue is perfect as a complement in the Natural Sciences subject. It allows students to observe in a practical way how human actions impact the ecosystem, teaching about biodiversity and climate change through direct interaction with the natural environment.
- Choose areas with varied vegetation and different types of ecosystems (forests, parks, gardens) to enrich the game experience. These environments offer a greater diversity of natural resources, providing a more complete and educational experience.
- The difficulty of the educational challenges can be adjusted based on the age or knowledge level of the group. This ensures that all students actively participate and face challenges appropriate for their cognitive ability.

About OUTSTE(A)M

[OUTSTE\(A\)M](#) is a project funded by the European Union's (EU) Erasmus+ programme under the Grant Agreement (101133868), running from 1 January 2024 to 31 December 2026. Coordinated by European Partnership aislb (EUN), a network of 30+ education ministries, OUTSTE(A)M brings together 3 partners to develop a toolkit that will help teachers and educators promote high quality outdoor learning experiences in the field of STE(A)M, as a means of addressing the

insufficient attention given to STE(A)M education in early childhood education and care settings (ECEC) as well as in primary schools.

Annexes

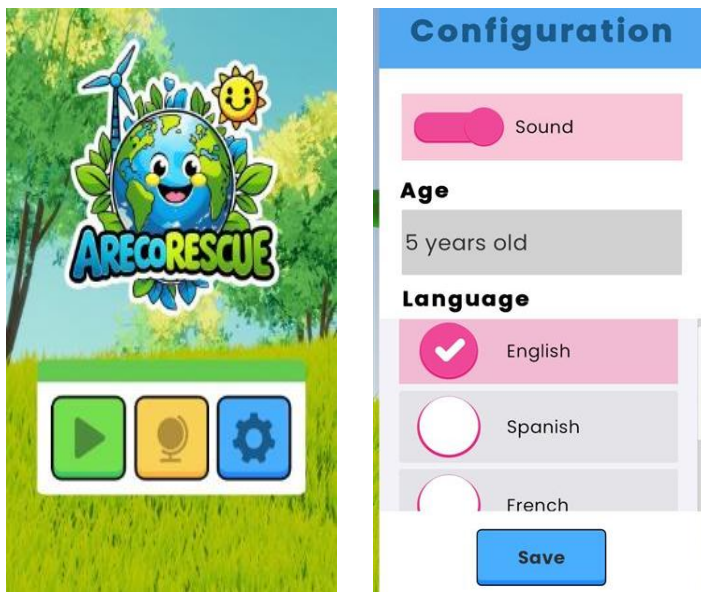
Annex 1. Features of the AREcoRescue game.

The images, visuals and photographs below highlight various features of the AREcoRescue game and scenes of pupils playing the game.

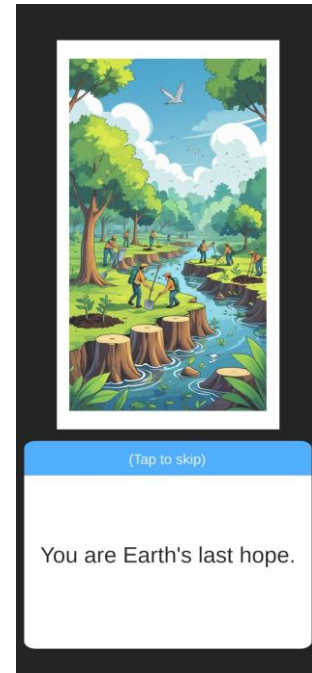
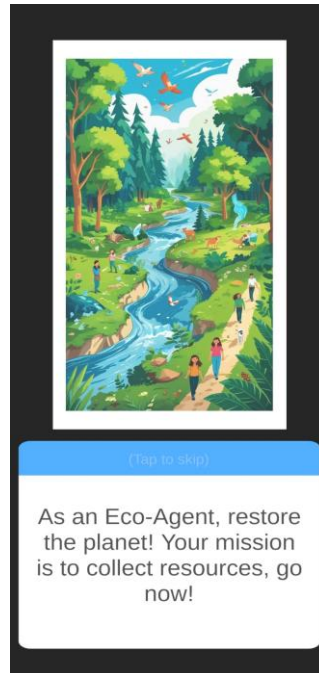
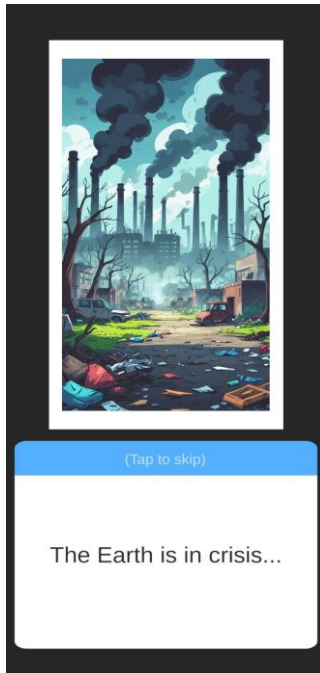
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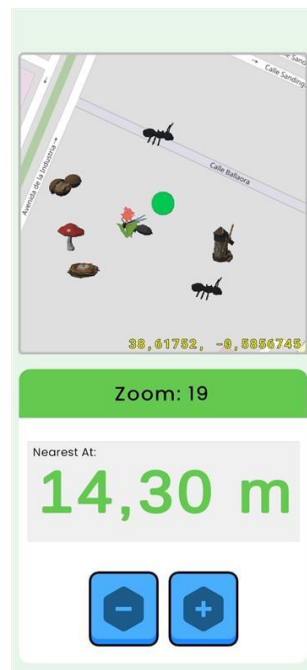
- Start screen and settings for sound, age, and language.



- o Brief introduction before starting to play.



- o Maps showing different resources in a real environment.



- o Photos of the activity:



