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The Role of Ecosystem Restoration in Combating Climate Impact



BIOS4YOU
AR 2.0

BIO-INSPIRED STEM TOPICS FOR ENGAGING YOUNG GENERATIONS
THANKS TO THE USE OF AUGMENTED REALITY

Project Number: 2023-1-DE03-KA220-SCH-000126516

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Name of the exercise:	Restore our Ecosystem AR App
Description of the exercises:	“Restore our Ecosystem” AR App uses an AR escape-room style scene in Delightex to engage with ecosystem restoration. Students enter a virtual degraded environment and are challenged to restore it by placing appropriate virtual elements (e.g., trees, pollinator plants, water features). Along the way, they must answer related quiz questions that connect ecological functions to their choices. Correct actions and answers earn them points, while mistakes provide immediate feedback, making the experience both gamified and educational.
Participants:	It can be conducted individually or in small groups (2–4 students) to encourage collaboration, discussion, and peer feedback while interacting with AR simulations of virtual representations of the materials.
Participants’ age range:	14-18 Participants should have a basic understanding of environmental science concepts (e.g. ecosystem restoration, biodiversity), along with fundamental literacy, numeracy, and ICT skills. They need access to a computer or tablet with internet connectivity and a willingness to engage with digital tools such as AR apps and Delightx. No prior coding or AR development experience is required.
STEM subject and specific topic:	STEM Subject: Interdisciplinary and Emerging Fields, Climate Change and Its Impact on Biodiversity Related Areas: Environmental Science, Biology, Geography, Digital Literacy/Computer Science, Art & Design, Social Studies (community action), Mathematics (data analysis in restoration), Language Arts (research, communication) Topic: The Role of Ecosystem Restoration in Combating Climate Impact
Gamification process:	- Leaderboards: Track individual or team progress based on design performance, quiz results, and creative application of green infrastructure.
Written or graphic description of Augmented info:	• 3D Models: Virtual representations of ecosystem restoration. • Information Overlays: Panels explaining benefits of restoration, such as trees absorb CO₂. Animated Feedback: Visual cues indicate the impact of





	student decisions—correct or false answers give extra The App is designed for classroom tables or desks, allowing students to explore and design without needing to move physically through the space.
External (or extra) tools required	Students will need a mobile device or tablet with AR capabilities, along with an internet connection for the initial file loading. A printed AR marker sheet or a screen-displayed trigger image may also be used to activate the AR experience.
Links (video, images, text online and so on).	-

Pedagogical specifications

Here we will collect information on how to use the exercise in the learning session and the results and benefits of using it, from a pedagogical perspective.

How can this augmented information be used to address a STEAM topic in a more interesting way for students?

The *Restore our Ecosystem* AR exercise makes learning about ecosystem restoration and biodiversity engaging and interactive. Students explore a virtual degraded environment and collect fallen trees to restore ecological balance. Embedded quiz questions connect ecological functions to their choices, helping students understand cause-and-effect relationships in ecosystems. This combines Science (ecology, biodiversity), Technology (AR tools), Engineering (designing restoration solutions), Art (visualizing landscapes), and Math (planning spatial layouts and estimating ecosystem impacts), creating a hands-on and meaningful STEAM learning experience.





Which pedagogical objectives are addressed through this scenario?

Understand Ecosystem Restoration: Learn how different ecological elements interact to rebuild healthy ecosystems.

Develop Critical Thinking: Make decisions about which plants and features to add, reflecting on their ecological consequences.

Encourage Collaboration: Work individually or in small groups, share strategies, and provide peer feedback on restoration choices.

Foster Environmental Awareness: Experience the impact of human actions on ecosystems in an immersive, interactive environment, motivating curiosity and responsibility.

The exercise helps students gain knowledge about ecological processes while also fostering problem-solving, analytical thinking, creativity, and teamwork—skills that are challenging to cultivate through traditional lectures.

Which results are expected to be reached with its use?

Through the *Restore our Ecosystem* AR activity, students will understand how plants, water features, and pollinators interact to restore ecological balance. By actively designing a restored ecosystem and completing quiz questions, students practice experimentation, reflection, and critical thinking. The gamified and immersive environment enhances engagement, and collaborative exploration encourages discussion, comparison of strategies, and reinforcement of ecological knowledge.

Which benefits are expected to be reached with its use?

AR allows students to visualize ecological processes and restoration outcomes in a dynamic, interactive way, making learning more memorable and engaging. The immersive experience promotes motivation, curiosity, and creative problem-solving. Immediate feedback on correct or incorrect choices reinforces learning and encourages reflection. Collaborative elements strengthen communication and teamwork skills, providing a social and practical dimension to STEM education. Overall, students develop a positive connection with environmental stewardship and gain both knowledge and practical understanding of ecosystem restoration.





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AR INFORMATION	
Technology	Augmented Reality
If it's needed a marker, description of the marker	QR code:  Share Code: BQY-PLF Share link: https://edu.delightex.com/BQY-PLF
Hardware and software needed:	Smartphone, tablet, laptop, PC
Type of Augmented data	3D models
Written description of the AR data	Students visualize 3D models such as virtual vegetation layers on buildings , explore a virtual degraded environment and place trees, pollinator plants, and water features to restore ecological balance, following ecological information boards.
If Image	-



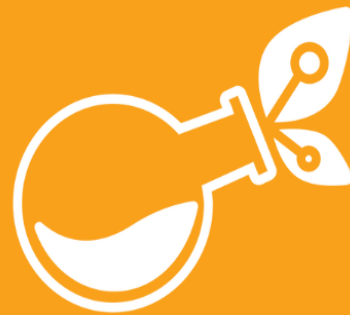


If Text	Collect keys to open the door Click both keys to collect them and click the lock to open the door. Move into the forest! Pick the fallen trees to restore The Dead Forest! Two keys are needed
If video	
If audio	-
If 3D model	The formats needed are:.obj,. stl.





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