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AI-Powered Biotechnology: Unlocking New Possibilities in Drug Discovery



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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General information

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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 Delightx 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. AI, molecular binding, drug targeting), 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, Artificial Intelligence in Biotechnology Related Areas: Digital Literacy/Computer Science, Art & Design, Social Studies, Mathematics , Language Arts Topic: AI-Powered Biotechnology: Unlocking New Possibilities in Drug Discovery
Gamification process:	-
Written or graphic description of Augmented info:	● 3D Models: Virtual representations of molecular interactions ● Information Overlays: Key concepts of molecular binding, drug targeting, and AI-assisted prediction. 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 *AI Drug Matchmaker* AR exercise transforms abstract concepts in biotechnology, chemistry, and AI into an interactive, hands-on learning experience. Students explore a simplified drug discovery process by guiding a virtual AI to select the correct drug molecule for a disease target. 3D visualizations show molecular interactions in real time, demonstrating stable bindings for correct choices and failures for incorrect ones. This combines Science (molecular biology, chemistry), Technology (AI and AR tools), Engineering (designing drug-target interactions), Art (visualizing molecular structures), and Math (analyzing interactions and binding efficiency), creating a meaningful STEAM learning experience.

Which pedagogical objectives are addressed through this scenario?





Understand Molecular Interactions: Learn how molecules bind to disease targets and how AI assists in drug discovery.

Develop Critical Thinking: Evaluate different molecules and predict their binding potential.

Encourage Exploration: Test multiple solutions in a safe, virtual environment and analyze outcomes.

Foster STEM Engagement: Experience the role of AI in biotechnology interactively, promoting curiosity and understanding of complex scientific processes.

The exercise helps students gain knowledge about drug discovery, molecular interactions, and AI applications while also fostering problem-solving, analytical thinking, and practical reasoning skills.

Which results are expected to be reached with its use?

Through the *AI Drug Matchmaker* AR activity, students will understand key concepts of molecular binding, drug targeting, and AI-assisted prediction. By interacting with 3D models and testing different molecules, they practice experimentation, reflection, and analytical thinking. The immersive AR environment encourages active participation and strengthens conceptual understanding, which is difficult to achieve with traditional lectures alone.

Which benefits are expected to be reached with its use?

AR makes complex molecular and computational concepts tangible and visually accessible, enhancing engagement, motivation, and comprehension. Students gain hands-on experience in a safe, interactive setting, allowing them to experiment with trial-and-error without real-world risks. The exercise also improves problem-solving and reasoning skills while fostering interest in biotechnology, chemistry, and AI, providing both knowledge and an interactive learning experience.





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Technical specifications

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AR INFORMATION	
Technology	Augmented Reality
If it's needed a marker, description of the marker	QR code:  Share Code: SXQ-UFM Share link: https://edu.delightex.com/SXQ-UFM
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 millions of virtual rapid tests of virtual compounds against a target protein.
If Image	-



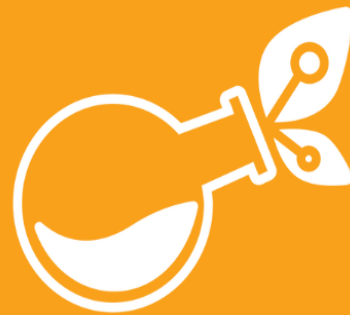


If Text	Target Identification AI analyzes biological data to identify disease-causing proteins. Machine learning finds patterns in genomic data that humans might miss, helping scientists choose the best targets for new drugs. – Virtual Screening AI rapidly tests millions of virtual compounds against the target protein. Deep learning models predict which molecules will bind effectively, saving years of laboratory testing. – Lead Optimization AI optimizes promising compounds by predicting how small chemical changes affect drug properties. Neural networks help design molecules with better efficacy and fewer side effects. – Toxicity Prediction AI models predict potential side effects before expensive animal testing. Machine learning analyzes molecular structures to identify safety risks early in development. – Clinical Trial Design AI optimizes clinical trial design by identifying ideal patient populations and predicting outcomes. This reduces trial duration and improves success rates.
If video	
If audio	-
If 3D model	The formats needed are:.obj,. stl.





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