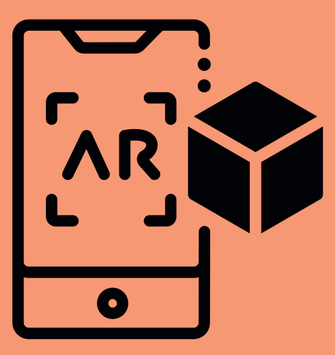
EXTENDED REALITIES IN TEACHING AND LEARNING MATHEMATICS

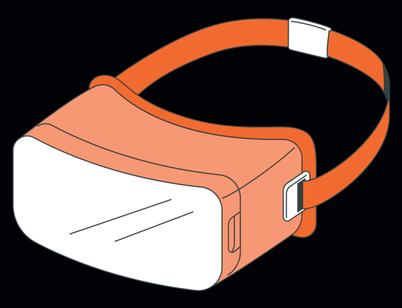
WHAT IS XR?

Extended Realities (XR) is an umbrella term used to cover all aspects of Augmented Reality (AR) and Virtual Reality (VR).



LOW IMMERSION

AR is used for low immersion activities through a computer or mobile device, meaning that virtual, computer-generated information is added to the real-world environment.



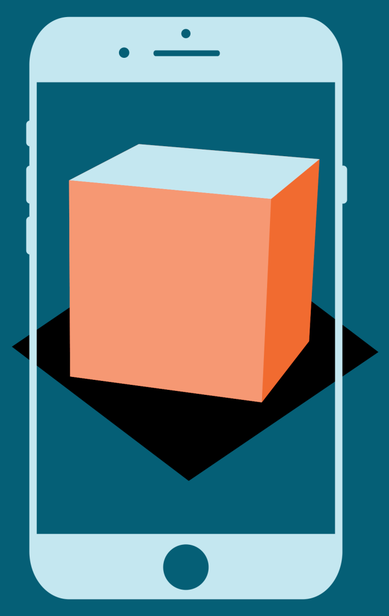
HIGH IMMERSION

VR is used for high immersion activities through a Head-Mounted Display (HMD), like a Quest headset. The user's perception is modified as they are transferred into a completely digital environment.

HOW TO USE XR IN THE CLASSROOM

GEOGEBRA 3D CALCULATOR

- This mobile app is used to graph 3D functions, create and place 3D shapes on any surface, and solve 3D math problems.
- With this interactive program, students are able to experiment with different shapes and equations, and allows the visualization of abstract concepts.

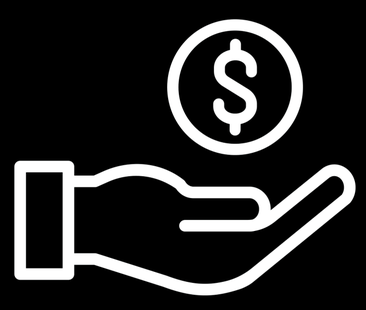


PRISMS VR

- This program fully immerses users into a virtual world where they get to solve real-world math problems individually or as a team.
- This program includes content modules, a multiplayer sandbox, and a dashboard so teachers can monitor student progress.

BENEFITS OF XR

- Increases motivation, learning willingness, self-efficacy, engagement, and curiosity for learning.



- Reduces experiment costs and promotes collaborative learning.
- Develops skills such as spatial orientation visualization and logical thinking.

CHALLENGES OF XR

- Hardware limitations, software limitations, and teaching and learning methodologies.

- A steep learning curve or complicated usability for both teachers and students.

- Can be hard to translate all the meaningful content into an enhanced reality experience.

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