

LearnSphere

Immersive learning with interactive 3D experience .

TeamName - **BlackSmoke-Hacks**

Naachiyappan
Nilash

Priyadarshan Raja
Rishikumar

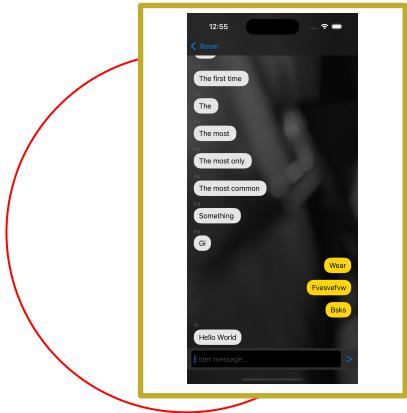
LearnSphere Introduction

LearnSphere is an innovative educational app designed to enhance student engagement and improve their learning experience through immersive visualizations.

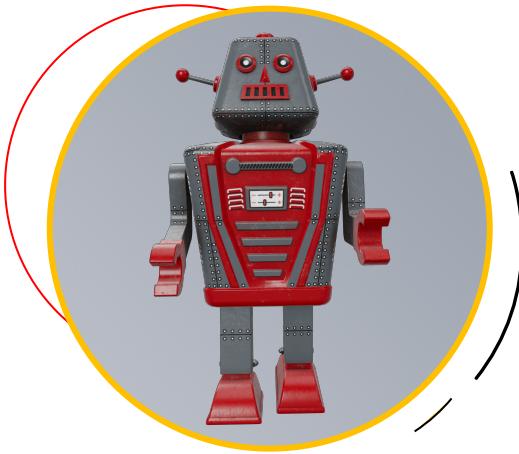
- **Objective:** To provide students with interactive and engaging tools for better understanding complex concepts.
- **Key Features:**
 - Interactive 3D models
 - Real-time discussions and collaboration

With LearnSphere, students can visualize, interact, and annotate on learning materials, fostering an immersive and dynamic educational environment.

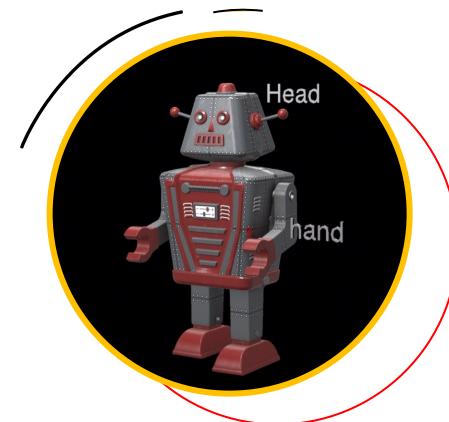
Features



Chatrooms/Discussion
thread



360° Model preview



Annotation

Web Application (Author/Admin)

Overview:

The web app is where the Admin, Author, or Teacher sets up a room with a unique room ID and uploads the necessary assets.

Assets Include:

- A 3D model
- A reference image, which will be used to trigger the 3D model in the mobile app.

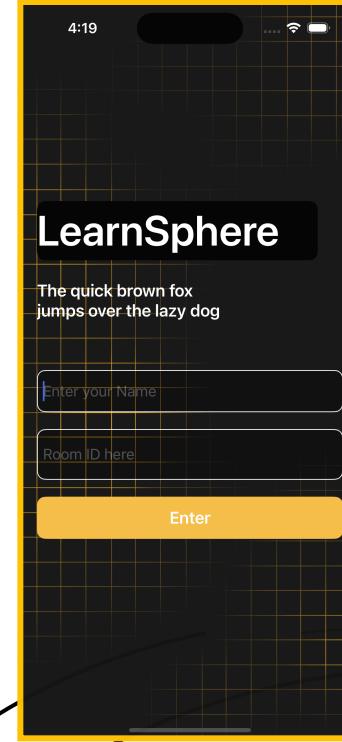
From the web app, the author can add, delete, and manage these assets. Once finalised, the assets are submitted to the file server, tagged with the unique room ID created by the author.

Mobile Application (User/Participants)

Room Entry & Asset Loading

1. The user enters the room by providing a unique Room ID and clicking “Enter.”
2. If the room exists, the assets added by the author (e.g., 3D model, reference image) are downloaded locally to the app.

Note: These assets are temporary and will be cleared when the user exits the room.



Mobile Application (User/Participants)

Room Home Screen Features

After entering the room, the user is navigated to the Room Home screen, which offers:

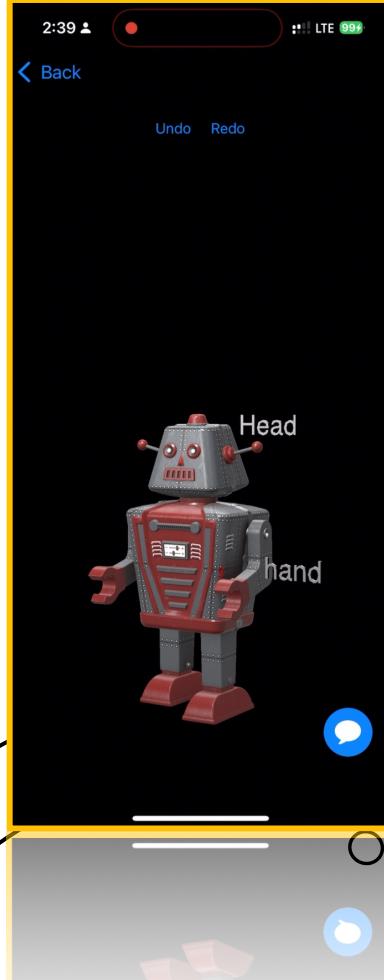
- **Open Discussion/Chat:** A space for participants to communicate/discuss.
- **Scanner Option:** Allows the user to scan reference images which in turn directs to the 3D model preview screen.



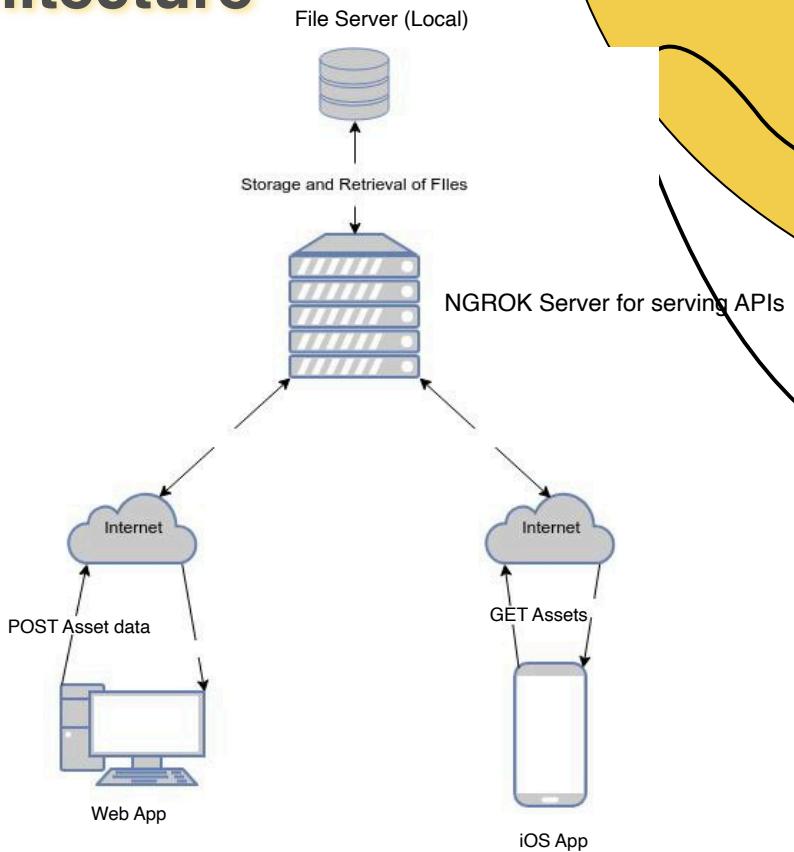
Mobile Application (User/Participants)

Engaging with the 3D Model

1. Once a reference image is detected, the associated 3D model opens in a 360-degree interactive preview.
2. Participants can:
 - View and explore the model from all angles.
 - Tap and hold on any area of the model to add text annotations.



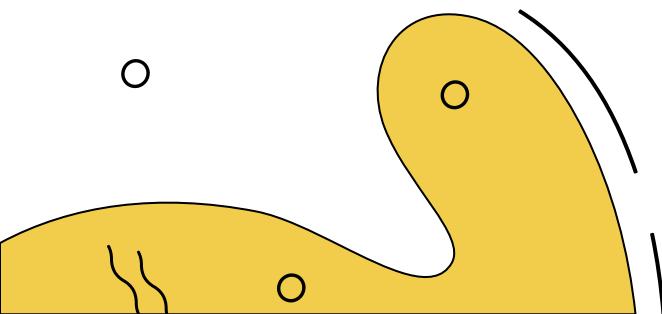
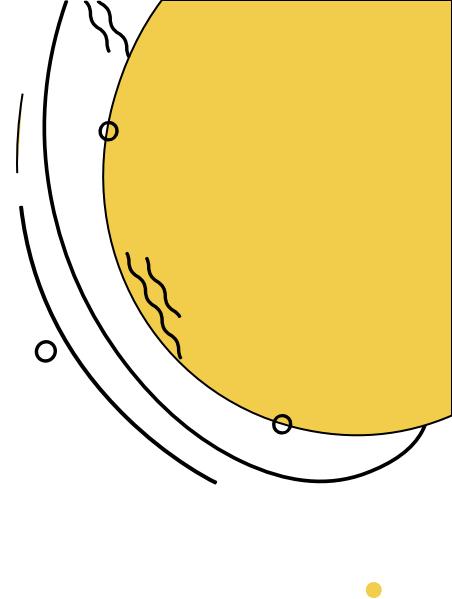
System Architecture



Technical Implementation Overview

iOS Mobile App:

- **Language:** Swift
- **Frameworks:** UIKit, ARKit
 - **UIKit:** Used to build the user interface and navigation across screens.
 - **ARKit:** For augmented reality features, including 3D model preview and real-time reference image scanning.



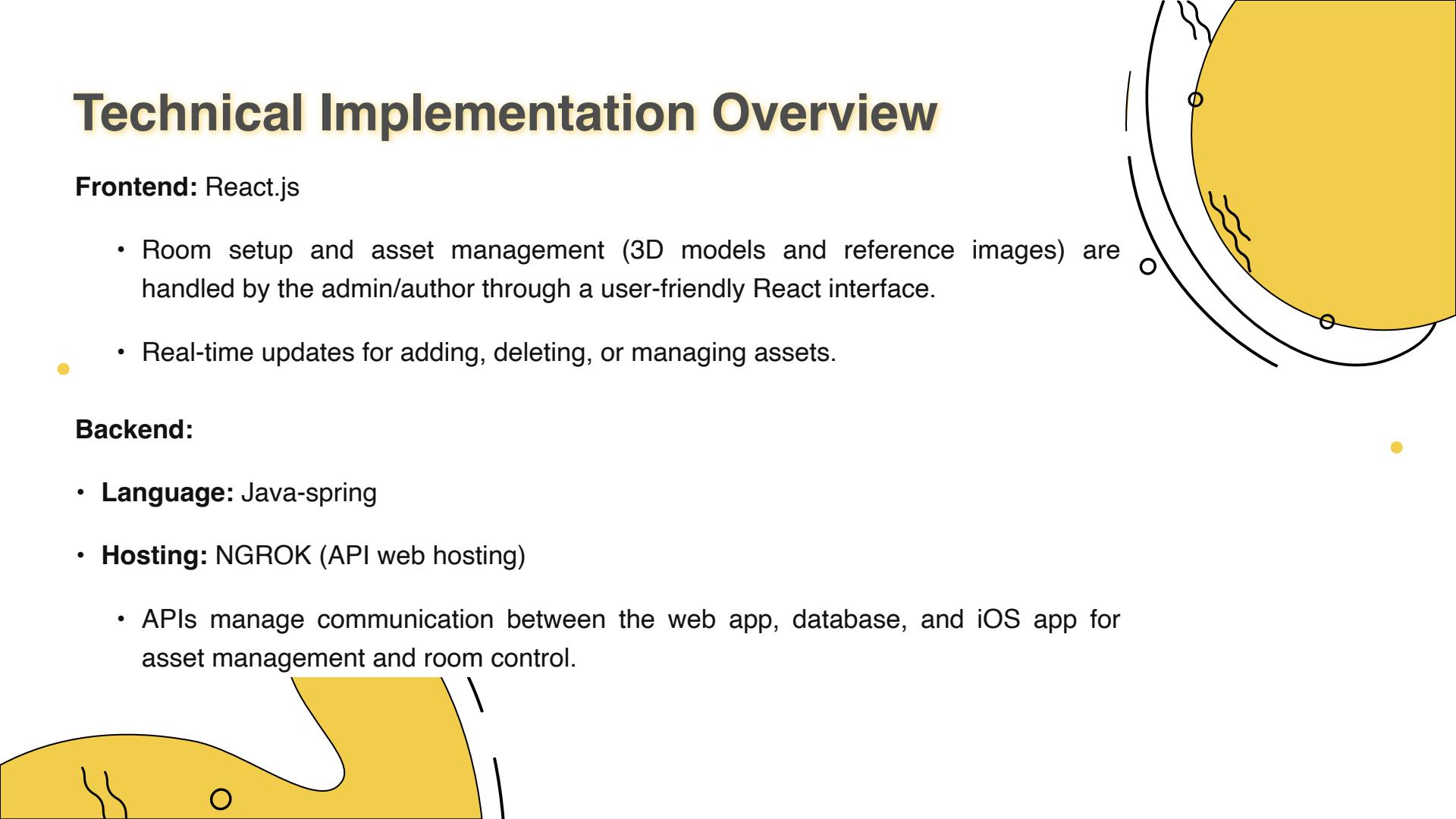
Technical Implementation Overview

Frontend: React.js

- Room setup and asset management (3D models and reference images) are handled by the admin/author through a user-friendly React interface.
- Real-time updates for adding, deleting, or managing assets.

Backend:

- **Language:** Java-spring
- **Hosting:** NGROK (API web hosting)
 - APIs manage communication between the web app, database, and iOS app for asset management and room control.



Technical Implementation Overview

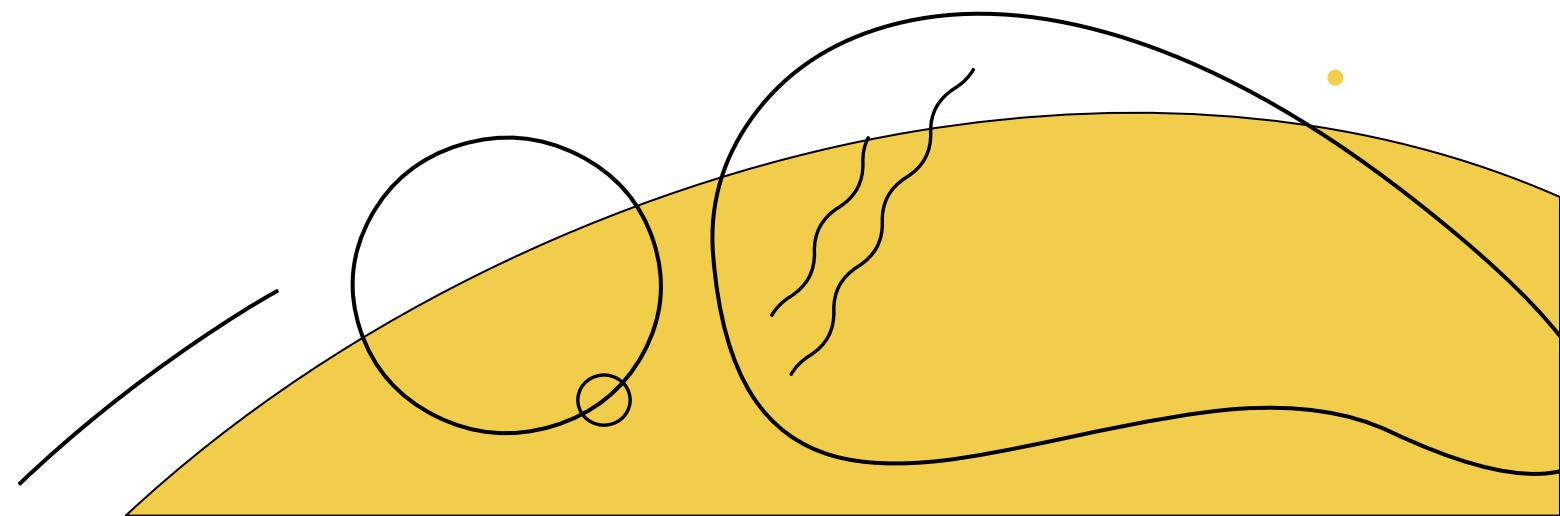
Database:

- **Postgres**: Stores room data, user information, and references to assets (e.g., 3D models, images).

Real-Time Chat:

- **Firebase Firestore**:
 - Supports the group chat functionality in the iOS app, enabling real-time conversations between room participants.

Demo

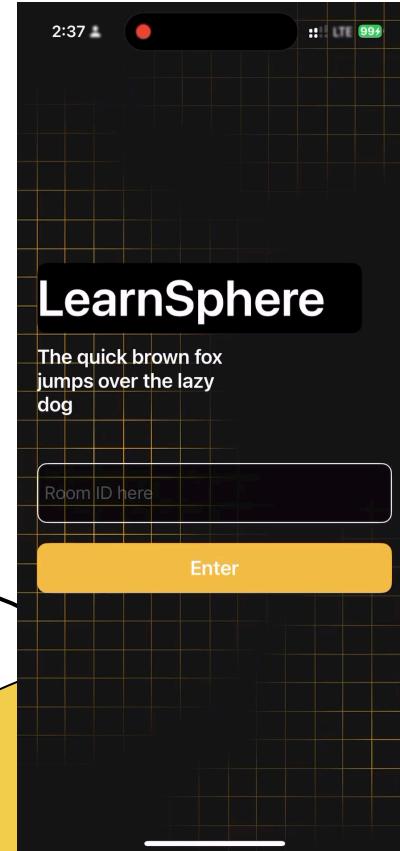


Author Id

Please choose an Unique Author ID

[COPY ID](#)**Add Image Set**[ADD SECTION](#)[CREATE ROOM](#)

App Demo



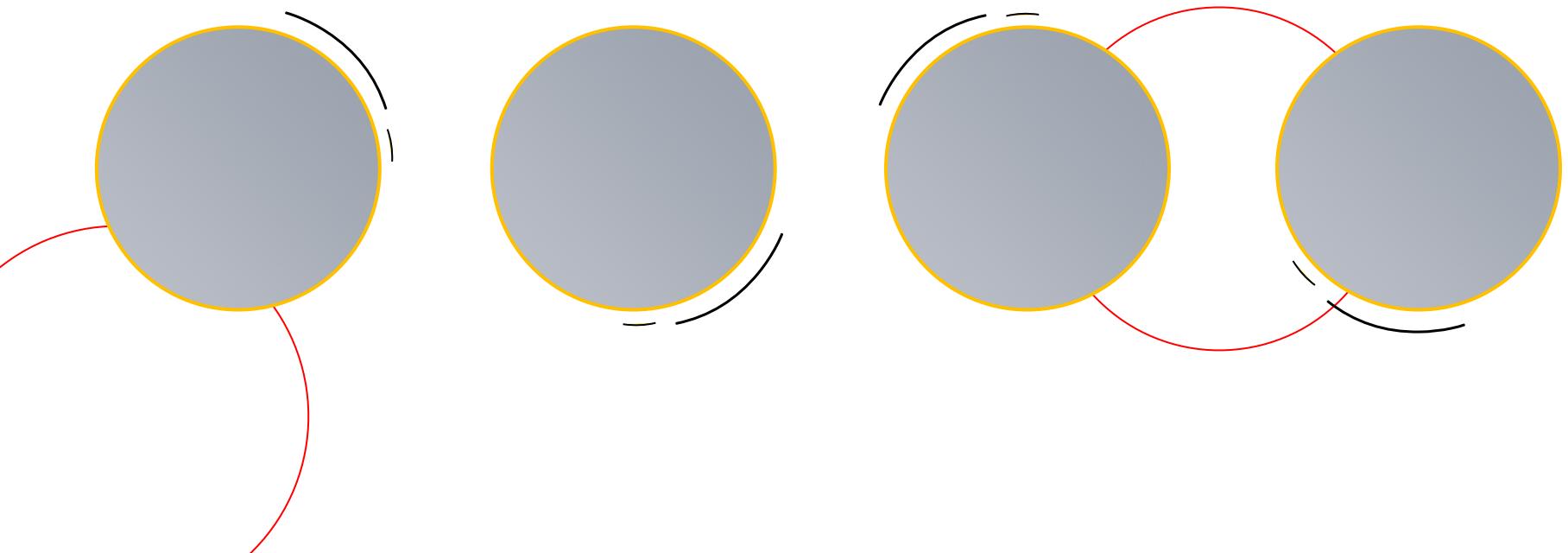
App Summary

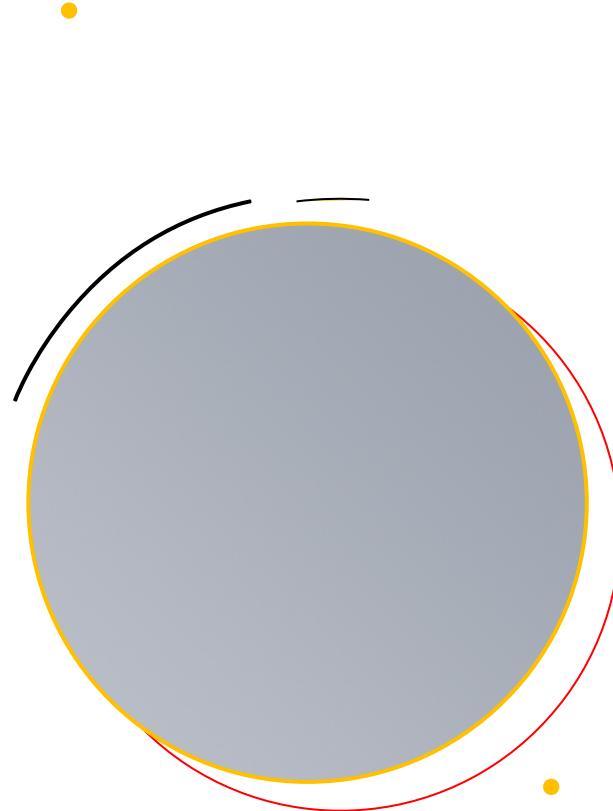
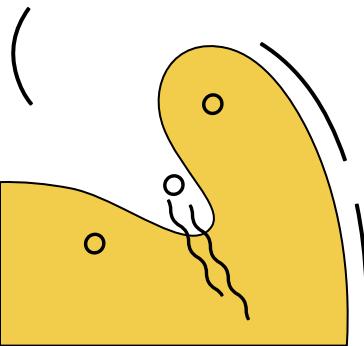
Interactive Learning: Enhances education by allowing students to visualize and interact with 3D models for a more engaging learning experience.

Subject Versatility: Supports a wide range of subjects—such as science, history, and mathematics—by bringing abstract concepts to life through its 3D capabilities.

Immersive Classrooms: Transforms traditional classrooms into immersive environments where students can explore complex topics in a hands-on way.

Improved Understanding: Helps improve knowledge retention and fosters curiosity by making learning more dynamic and visually impactful.







Thank you