MONTFORT SECONDARY
A Montfortian Gabrielite Education Institution

2026 Applied Learning Programme (ALP) on Autonomous Car and Immersive Technologies (AR & VR)

Preface

This programme introduces you to exciting areas of modern technology through hands-on and project-based learning. You will explore Artificial Intelligence, autonomous systems, and immersive technologies by designing, building, and programming real working solutions. Through guided challenges, you will develop problem-solving, computational thinking, and creative skills while learning how technology is used in real-world applications.

You will begin by creating and programming an autonomous vehicle using AI technology, before moving on to design Augmented Reality (AR) and Virtual Reality (VR) experiences that combine creativity with technical skills. Throughout the programme, you will learn to use technology responsibly and ethically, and apply your learning in a final showcase that demonstrates both your technical ability and creative thinking.

Student Training Guide

Version B1.1

(updated as of 8 January 2026)

Programme Overview

In this programme, you will dive into two powerful areas of modern technology: Artificial Intelligence & Autonomous Systems, and Augmented & Virtual Reality (AR/VR). Through guided challenges and creative projects, you won't just learn about technology — you will build, develop functionality, and create with it.

🚗 Part 1: AI & Autonomous Vehicles

You will begin by learning how intelligent systems work by building and programming your own autonomous vehicle using the Micro:bit Cutebot with AI lens technology. Step by step, you will take on challenges such as navigating routes, detecting objects, tracking movements, and competing in robotic soccer-style tasks. Along the way, you will apply computational thinking, problem-solving, and basic engineering concepts to make your robot smarter and more reliable.

🌐 Part 2: AR & VR Development

Next, you will enter the world of immersive technologies. Using CoSpaces Edu, you will learn how to create interactive augmented reality experiences and design fully immersive virtual environments. These experiences will challenge you to think creatively about how digital spaces can solve real-world problems and communicate ideas in new ways.

🧠 More Than Just Technical Skills

Throughout the programme, you will develop important 21st Century Competencies, such as critical thinking, creativity, collaboration, and responsible decision-making. You will also explore how technology should be used ethically and responsibly to benefit people and communities.

By the end of this journey, you won't just be a user of technology — you will be a creator, thinker, and problem-solver, ready to take on future challenges with confidence.

6. Introduction to Immersive Technologies

Immersive technologies are digital tools that allow us to **experience and interact with information in new and engaging ways**. Two common types of immersive technologies you will explore in this programme are **Augmented Reality (AR)** and **Virtual Reality (VR)**.

Augmented Reality (AR)

Augmented Reality adds digital content—such as images, text, or animations—on top of the real-world using devices like smartphones or tablets. You can still see your surroundings, but with extra digital information layered onto them.

Real-world examples today:

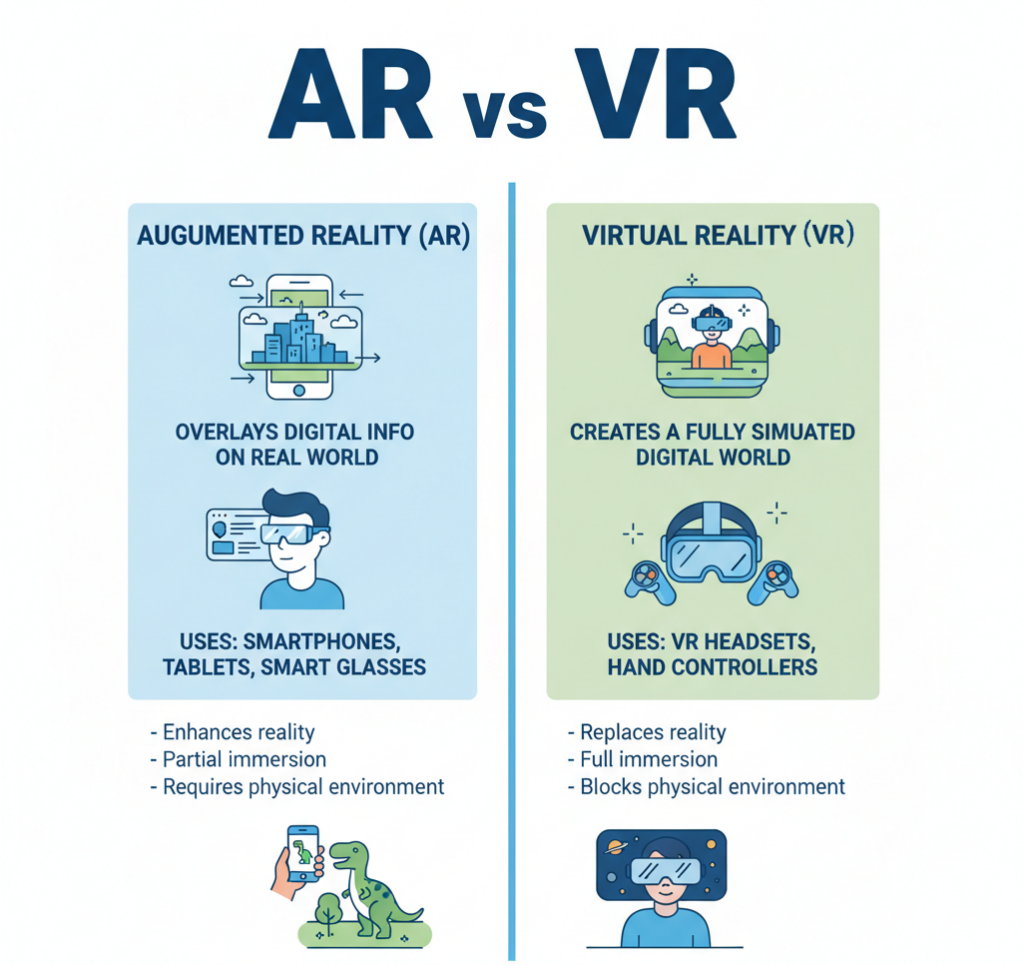
- Using phone apps that show 3D objects in your room
- Filters on social media that track faces or objects
- Educational apps that bring science models or history scenes to life
- Navigation apps that overlay directions onto real streets

Virtual Reality (VR)

Virtual Reality places you inside a fully digital environment, where everything you see is computer-generated. Instead of adding to the real world, VR creates a new world for you to explore.

Real-world examples today:

- Virtual tours of museums or historical sites
- Flight or driving simulators used for training
- Virtual environments used in game design and storytelling
- Design simulations for buildings, cities, and products



i. Real-world Connection

Can you name one real-world example where AR or VR is used today? How does it help people?

_____

_____

ii. Application & Purpose

If you were to design an AR or VR experience, what problem would you want it to solve or what idea would you want to share?

_____

_____

iii. User Experience

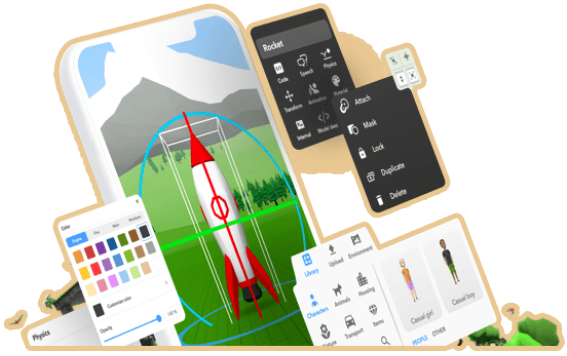
What do you think makes an AR or VR experience useful or meaningful for users?

_____

_____

7. Introduction to CoSpaces Edu

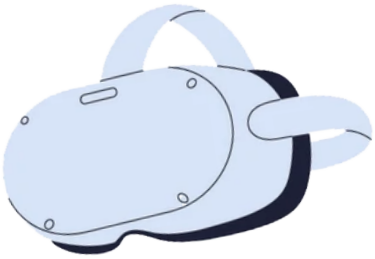
CoSpaces Edu is a creative digital tool that lets you **build your own virtual worlds and interactive experiences**. Instead of just learning about technology, CoSpaces Edu lets you *create with it* by designing 3D environments, adding characters and objects, and programming how things behave.



In CoSpaces Edu, you can:

- **Build 3D scenes** like cities, stories, or simulations
- **Add interactivity** using simple visual programming blocks
- **Explore in VR or on screens**, making your creations feel real
- **Share and present** what you've built with others

This tool helps you express your ideas, solve problems creatively, and think like a digital creator. As you work with it in this programme, you'll learn how virtual environments are made and how code can make things come alive!



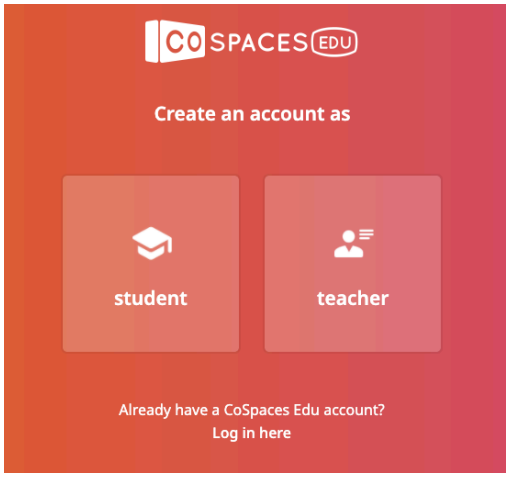
7.1. Creating your Account

A. Visit: https://cospaces.io/edu/

B. Click on the 'Get Edu' button on the top right corner

C. Click on the 'Sign Up' button on the top right corner

D. Select 'Student' as account



E. Key in the class code given by trainer

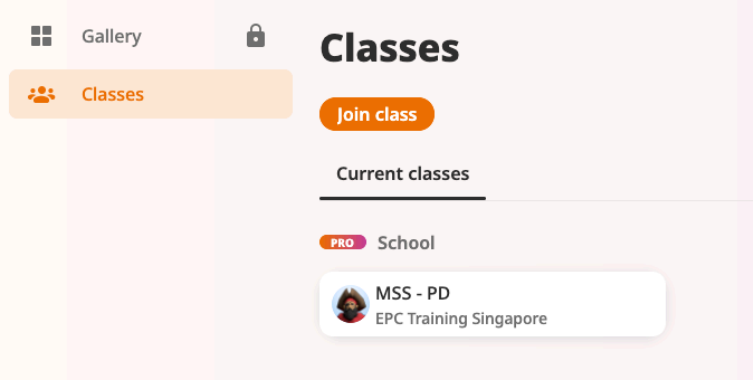
F. Input your Name, Username and Password ***(Please input a username that is appropriate and represents your group.)***

G. Click on submit

H. Please write down or save your username and password

Tip: Please choose a strong password that you and your groupmate can remember.

Upon successful registration, you will be automatically redirected to your account's dashboard, like the following:



Note: In the classes' menu, you should be assigned to your class. If you are in the wrong class, please inform the trainers.

7.2. Getting Started

In this section, you will learn how to navigate the CoSpaces Edu platform and use its basic tools. By following the built-in CoSpaces tutorials, you will practice moving around the workspace, adding and editing objects, and understanding how scenes and environments are created.

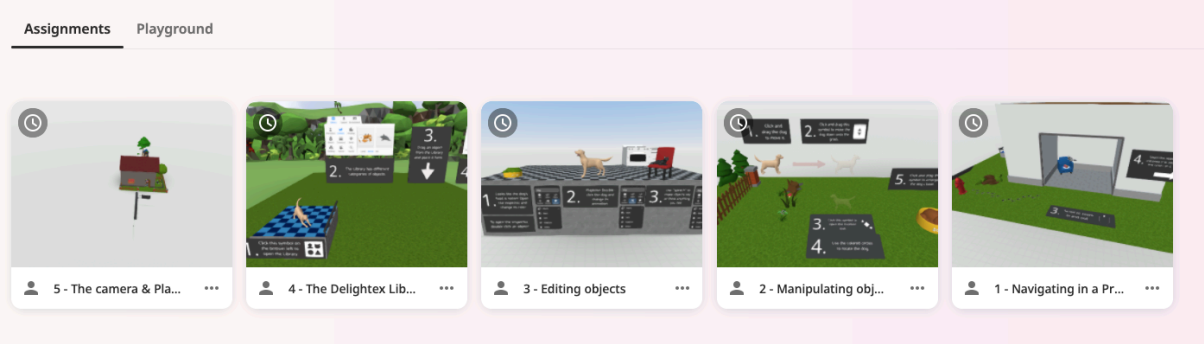
This activity helps you become familiar with the platform so you can confidently use CoSpaces Edu to design your own interactive AR and VR experiences later in the programme.

A. Click on your classroom and enter
B. In Assignments tab, complete the following assignments:
    a. Navigating in a project
    b. Manipulating objects

c. Editing objects

d. The Delightex library

e. The camera and play mode



What ideas came to mind while you were exploring the platform that you would like to try later?

_____

_____

What was one thing you found challenging, and how did you overcome it?

_____

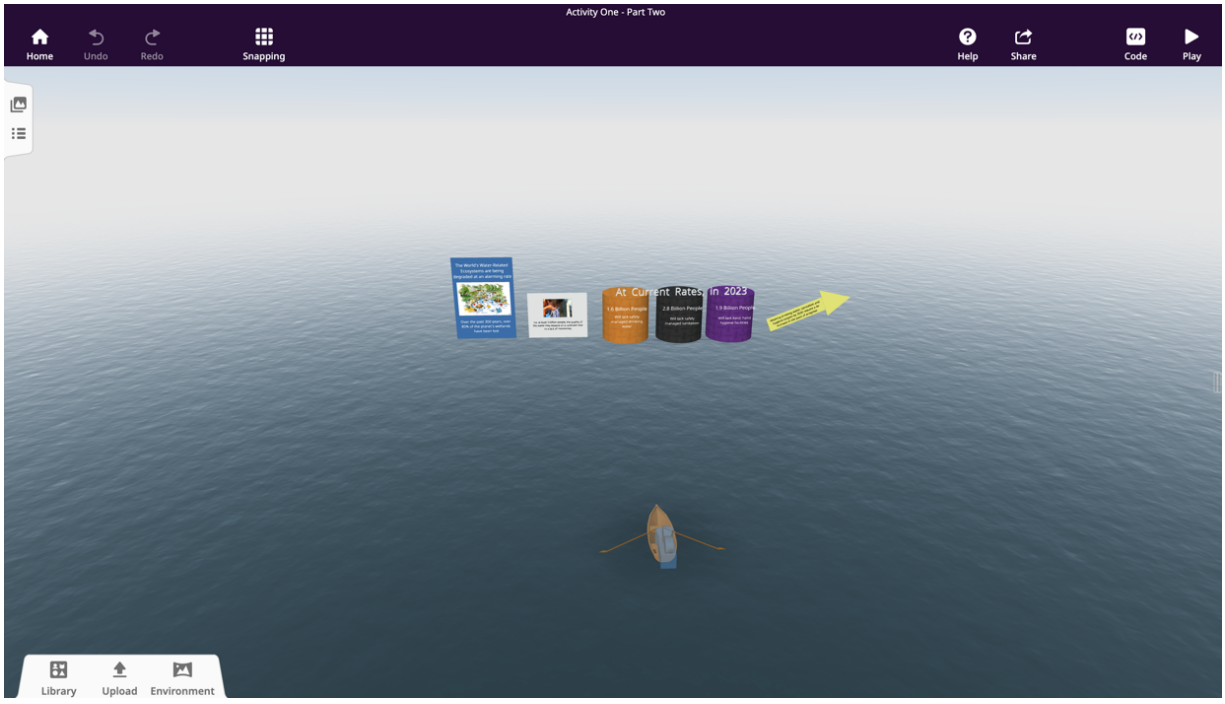
_____

7.3. Create a Simple Project

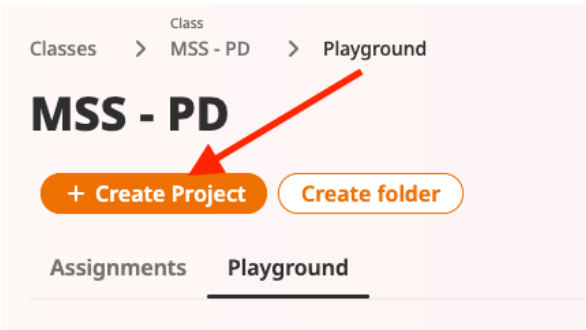
In this guided activity, you will follow step-by-step instructions to create a simple AR scene using CoSpaces Edu. You will practice adding objects, positioning them in a scene, and viewing your work in Augmented Reality (AR).

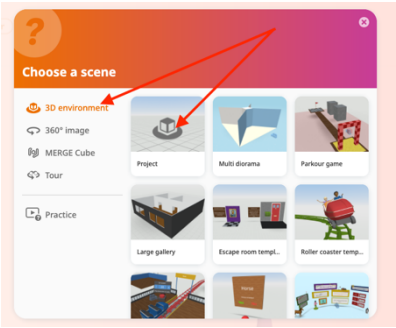
This activity helps you understand how AR works and gives you a clear example of how virtual objects can appear in the real world.

By the end of this activity, you will achieve an informative 3D environment.

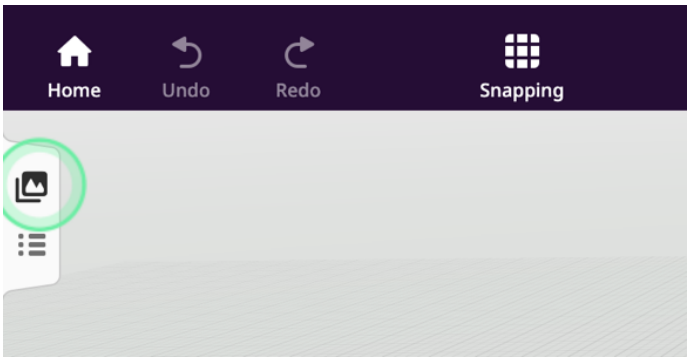


1. Login to your CoSpaces Edu account
2. In the classes' menu, click on 'Playground' tab
3. Click on '+ Create Project and select 'Project'

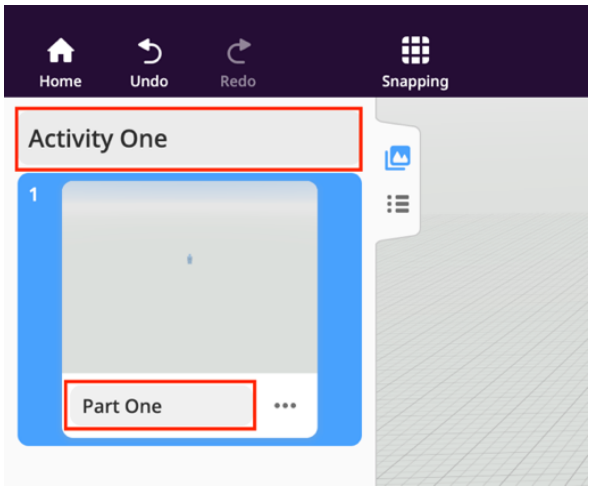




4. Click on the scene icon

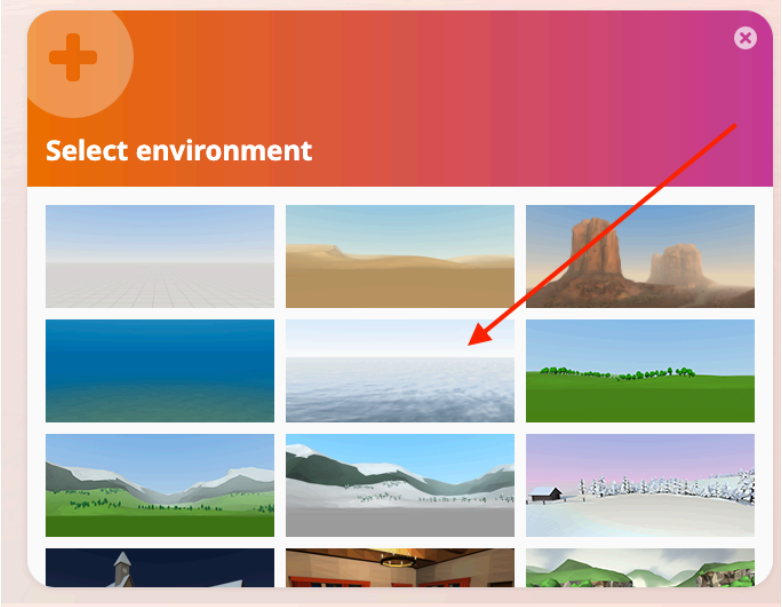


Rename the name from 'Project' to Activity One, and scene name to Part One

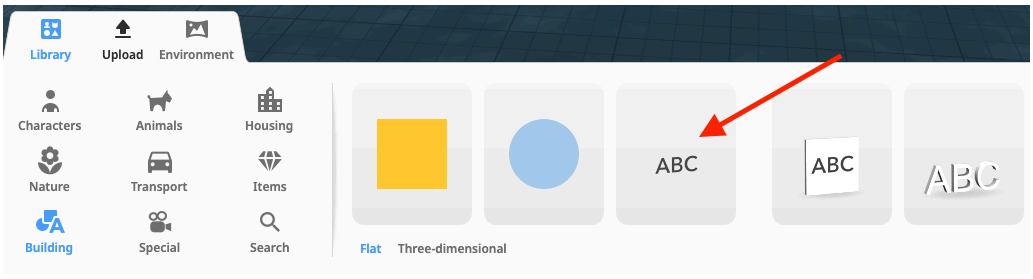
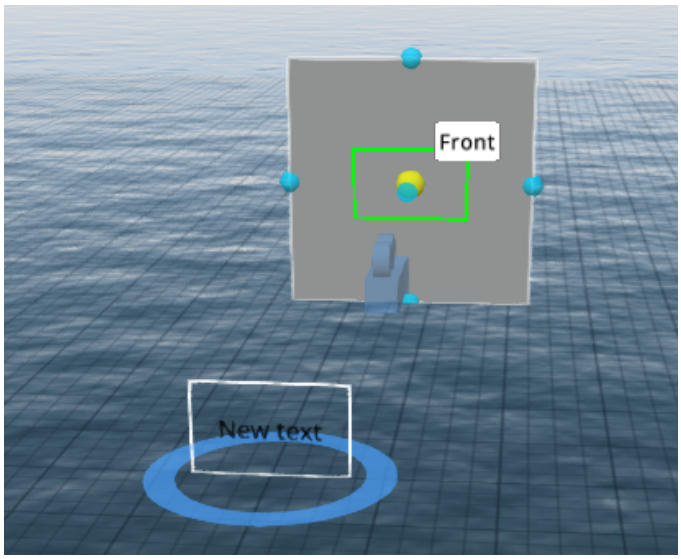


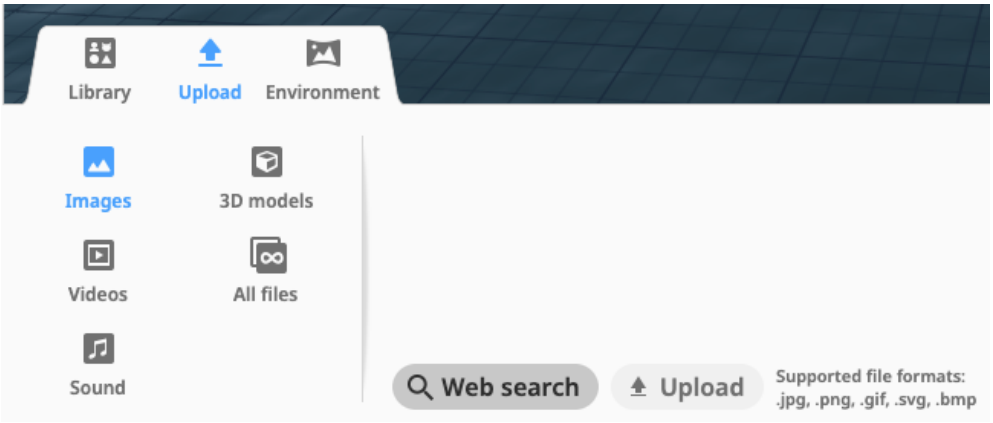
5. Click on the ‘Environment’ icon on the bottom left and ‘Edit’ environment.

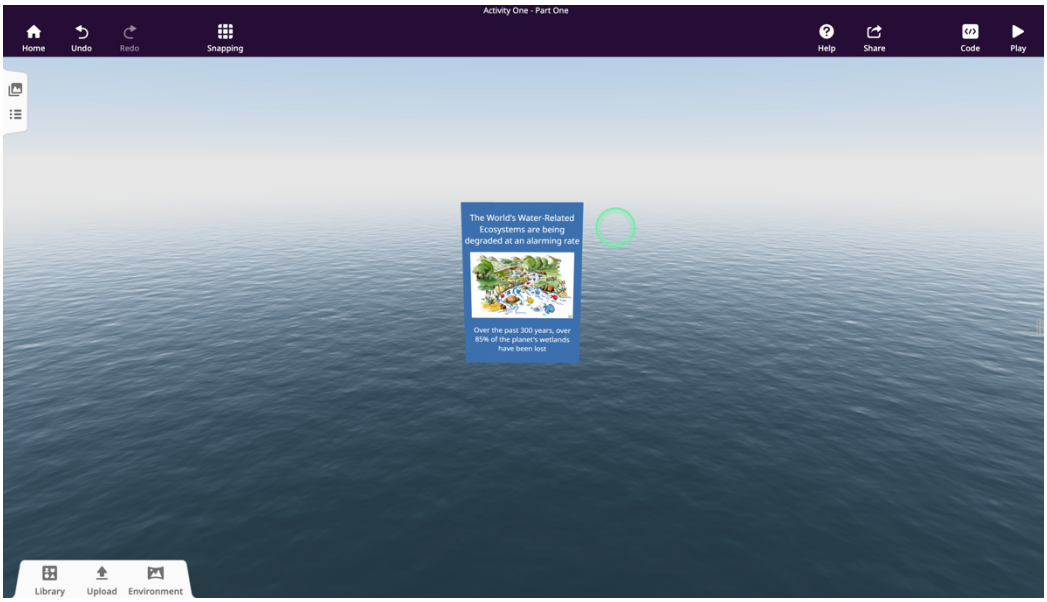
Choose the ‘Sea’ environment



	Create the First Display Board
☐	Click on the Library tab
☐	Under the building menu, drag the ‘Brick wall’ object into the workspace

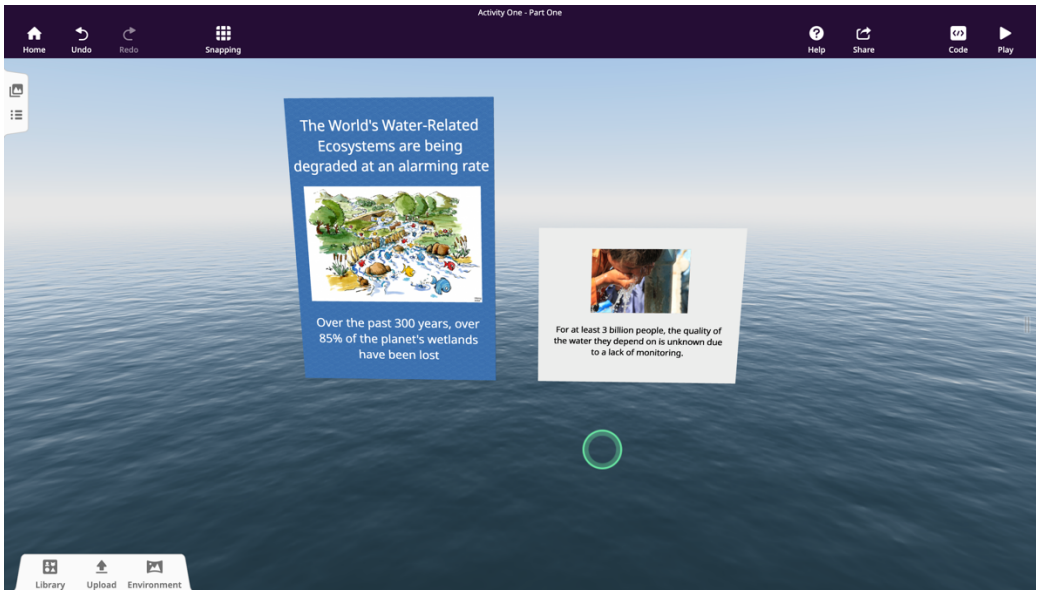
☐	You may change the height or width of the object by pressing and dragging one of the pointers around the object.
☐	Double click the object to see more settings
☐	Click on material, and for texture select ‘none’, choose a preferred colour
☐	Drag a text object from the building menu 
☐	With the text object selected, hit on the ‘a’ key on your keyboard, this allows us to attach an object to another object. Select the top front position of the Brick Wall 

☐	After attaching the text object, use the 'drag to lift' and drag the text to the top of the Brick Wall. (Note: even if the object is not touching the attached object, it is still attached to it. To detach objects, double click or right click on the object and select detach
☐	Change the color of the text to white
☐	Change the text content[1]
☐	Click on the Upload menu, select Images 
☐	Use the web search function by keying a keyword and hit Enter to find a suitable image for your text
☐	Drag an image to the environment and attach it to the center of the Brick Wall

☐	You should achieve something similar: 
☐	Click on the Play button at top right corner of your screen to view it in actual 3D environment mode

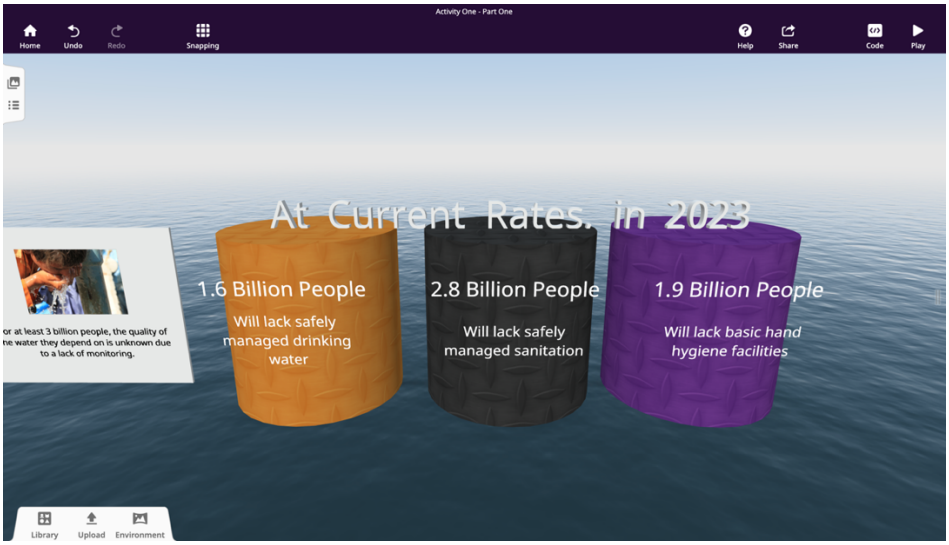
Tips:

1. Don't see any objects after pressing play? Check if your camera is behind and facing the objects.
2. Hit 'S' on your keyboard to quickly hide and show the grid on your workspace. Hiding the grid allows you to view your objects clearer.
3. Made a mistake? Undo or redo by clicking on the turn-back or turn-front arrow respectively, right beside the Home menu/icon.

	Create the Second Board
☐	Add a text panel to the environment, position it next to the first board
☐	Edit the text to relevant content[1] and add an image
☐	You should achieve something similar: 

	Create 3D Boards
☐	Add a cylinder to the environment, position it next to the second board

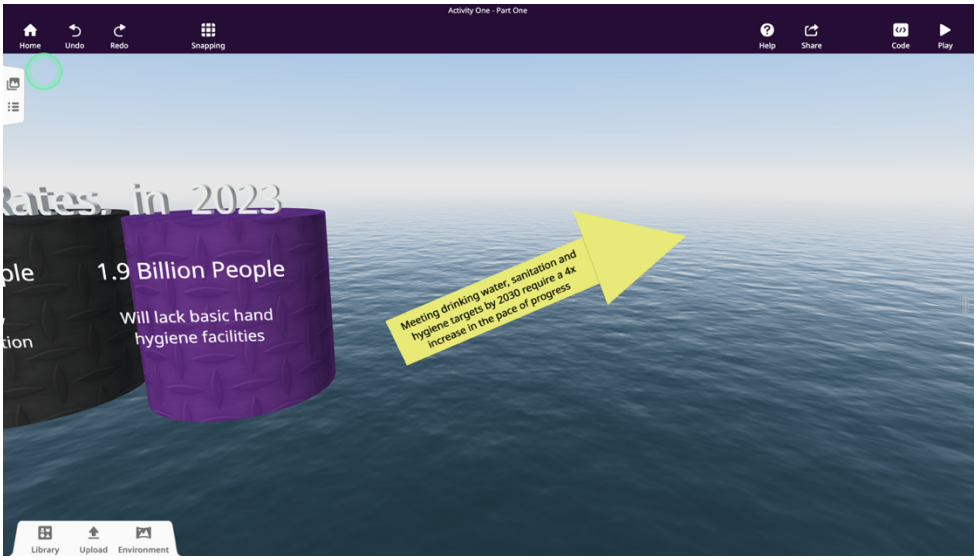
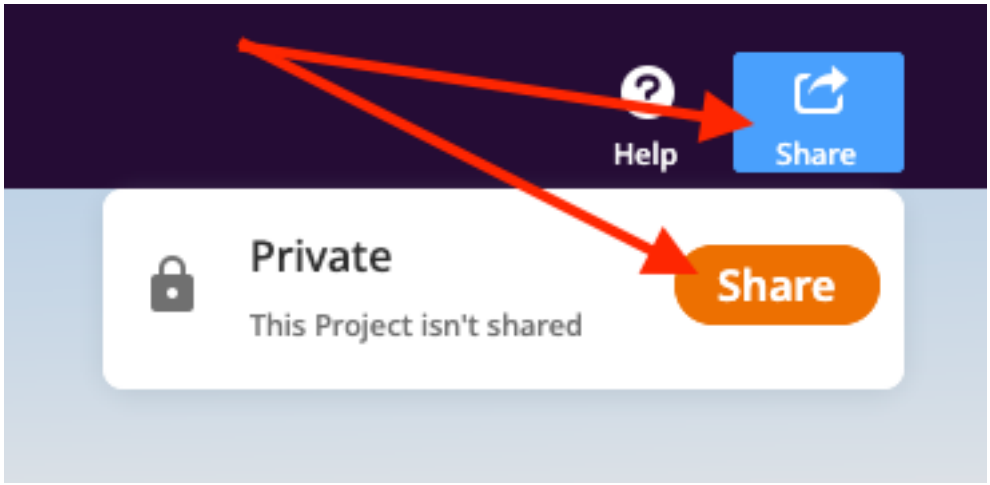
☐	Increase or decrease the size of the cylinder (or other objects) by pressing and dragging your cursor upwards or downwards respectively
☐	Add text and attach to the cylinder
☐	Duplicate the cylinder by holding alt key on your keyboard and dragging the object. Alternatively, you can double click on the object and select 'Duplicate'
☐	Repeat the above step and duplicate one more cylinder
☐	Add a 3D Text object and place it above the centre cylinder
☐	Group objects together by holding shift key on your keyboard and selecting objects with your cursor. Once all selections are done, double click or right click on an object and choose 'Group' to group them together Grouping multiple objects as a whole make it easier to manipulate it as a whole
☐	You should achieve something similar:

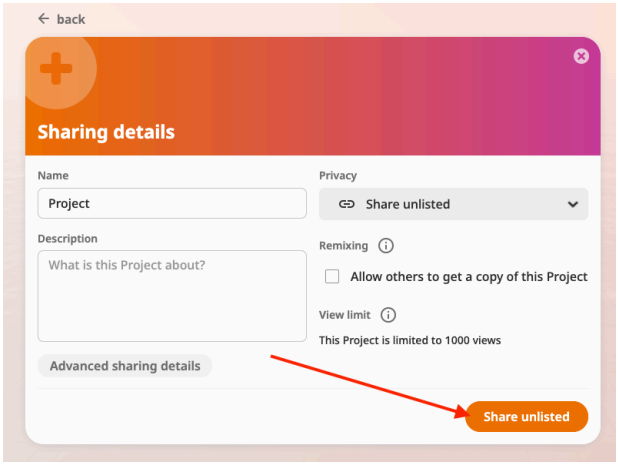
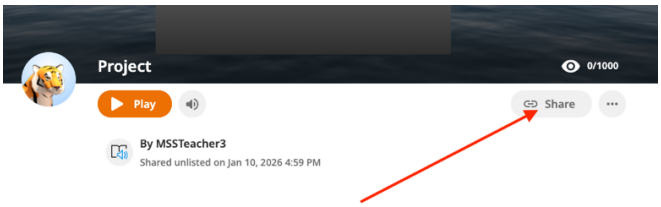
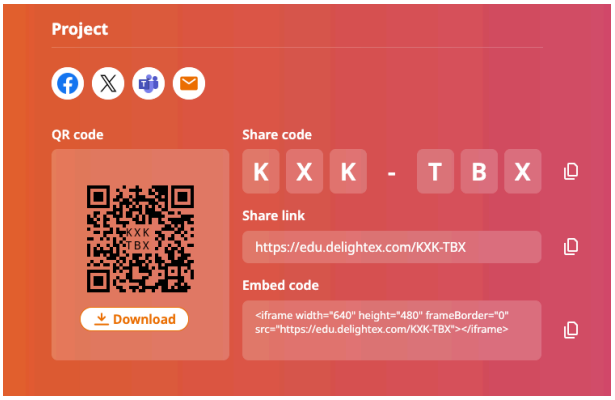
	

Tips:

1. Find it difficult to view the objects? Scroll in and out to zoom, or change the view of your viewing port to have a better control.

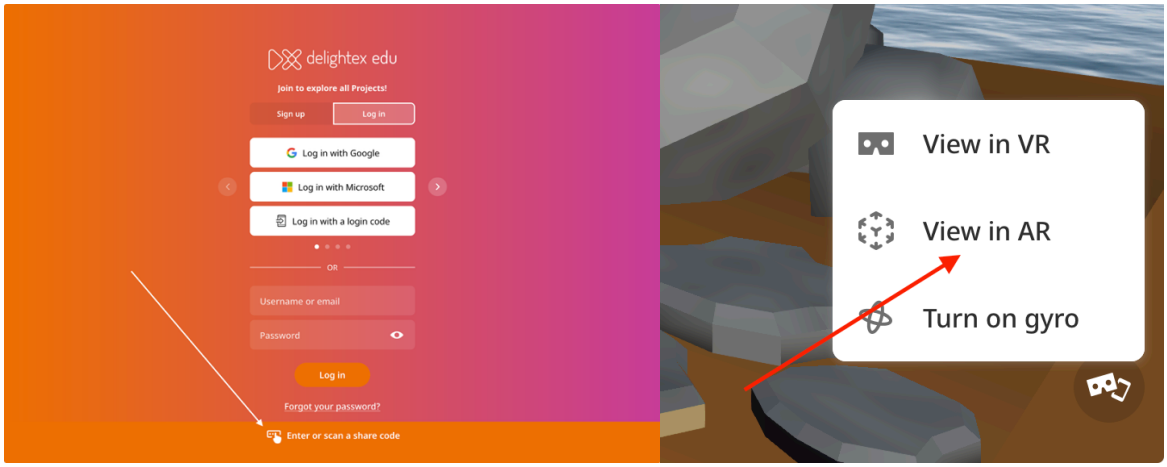
	Create an Arrow Board
☐	Add a text panel to the environment, position it next to the previous 3D boards
☐	Edit the text to relevant content[1]
☐	Add a 3D Tetrahedron
☐	Scale it slightly bigger than the text panel object

☐	Flatten the 3D Tetrahedron by decreasing it's width or length
☐	Position it with the text panel so it looks like an arrow, and group the two objects together
☐	You should achieve something similar: 
☐	Once you have completed the activity, click on the share icon and share your project 

☐	Click on ‘Share unlisted’ 
☐	At the shared project page, click on ‘Share’ button 
☐	A QR code and project share code and link will be generated. Use the device at the front of the class to scan the QR code and view your project in AR.  *This shared QR code and link is for reference. Please proceed with your own sharable code and link.*

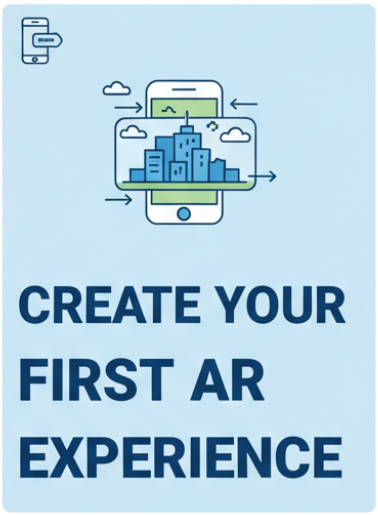
Train your perspective by playing around with 3D objects and making it 2D, vice versa.

View the project in AR using the device provided. Click on 'Enter or scan a share code' and load your project.



If you make any changes to your project after sharing, please reshare the project and click update to update latest version for viewing.

8. Create Your Own: My First AR Creation!



In this activity, you are tasked to create a simple project using CoSpaces Edu to apply what you have learned from the tutorials.

You will:

- Design a basic scene, add objects, and
- Explore how digital elements can appear in the real world through Augmented Reality (AR).

The goal is not to make something complex, but to experience how AR works and understand how virtual objects can interact with real surroundings.

By the end of this activity, you will view your creation in AR and reflect on how immersive technology can be used to communicate ideas or enhance real-world experiences.

What did you notice about how virtual objects appear in the real world when viewing your project in AR?

_____

_____

What was one thing you found easy to create in your AR project, and one thing you found challenging?

_____

_____

If you had more time, what would you improve or add to your AR project?

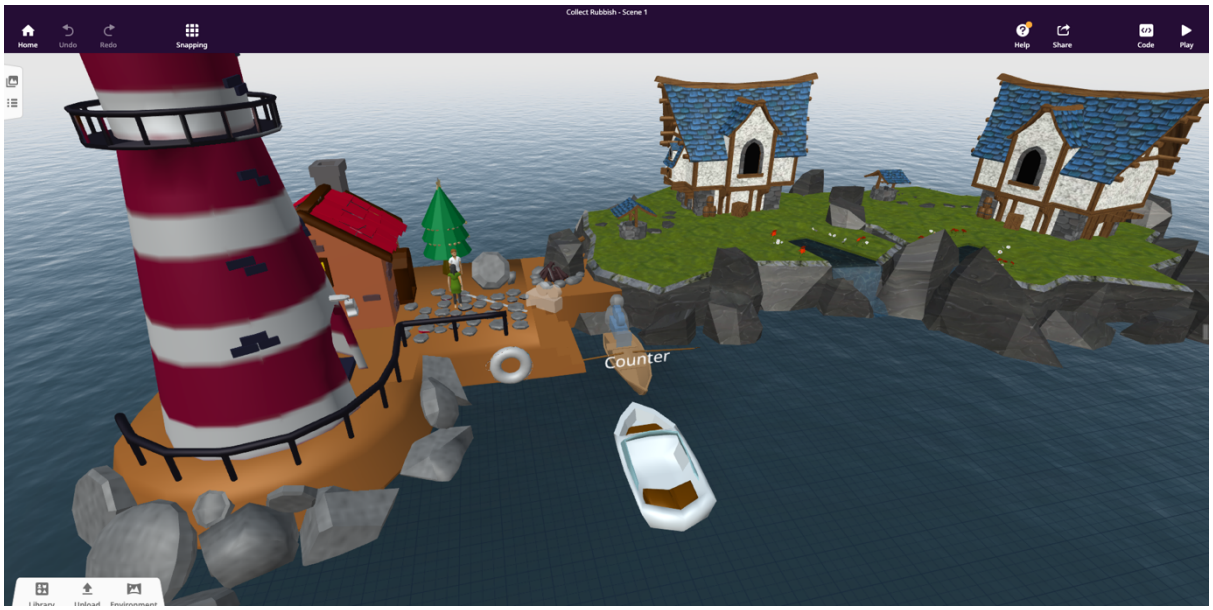
_____

_____

9. Exploring Virtual Reality (VR)

In this activity, you will explore a sample Virtual Reality (VR) project created using CoSpaces Edu. You will navigate through a virtual environment, observe how objects and spaces are designed, and interact with elements within the world. This experience helps you understand how VR places users inside a fully digital environment and how design choices affect the user's experience.

The focus of this activity is on exploration and observation, not building. As you move through the virtual space, you will think about how VR can be used to tell stories, or create games and simulate real-world environments, or help people learn in new ways.



View the assignment 'Explore VR: Collect Rubbish Game!'