Outline of the feedback given by our client

We showed the clients our main idea, which was a first person view of a city and then of an underground shelter. Our idea was to walk through a wrecked city and then go into an underground bunker (or subway systems which were converted to underground shelters). At some point, we mentioned that we wanted to quickly show a wrecked school while touring through the city. The clients seemed to really like this idea, as they put a huge emphasis on it and kept talking about it. In fact, they suggested only doing a tour of a classroom after the robot invasion, not a whole city. Their reasoning behind this was that building a whole city on Unity would take too much time. Plus, they thought that showing how a classroom changed because of the robots would be a good idea since it would show the impact that autonomous weapons would have on children. The goal of this is to evoke more feelings of sadness and concern, since people tend to care about children more than they do about adults. Kids are more innocent so it's more saddening if something bad happens to them. Also, children are our future, so showing that the robots are affecting them too really shows that mankind's future is bleak. The client's also liked our idea of conveying emotions using sounds or visual effects (for example, making the environment darker to show hopelessness). Moreover, the clients liked our idea of including masks and special kinds of clothing that hide the wearers from the robots.

We used this feedback to improve our final solution by simplifying the design: instead of doing a tour of a whole city and then underground shelter, we're only going to be doing a tour of a classroom. Plus, we're going to try to drive home the point that kids are also going to be affected by this by including more details in the classroom. For example, we're going to include posters drawn by little kids about avoiding robots. Thus, we're going to take a kid's classroom, which is normally a very innocent and happy environment, and turn it into a hostile one. We were thinking of boarding up the windows to show that there are threats outside, of including scary masks that the kids have to wear to avoid getting detected, and of including an attendance list with names crossed off (to show that some kids went missing). We're hoping that this contrast evokes strong emotions which would push decision makers to preemptively ban autonomous weapons.

A simple analysis of critical components

To create a truly immersive experience, it is important that the user can explore the environment with ease. Our script facilitates this by allowing users to move freely using WASD and arrow keys on their keyboard. The WASD keys enable movement (forward, backward, left, right), while the arrow keys control the user's viewpoint. In virtual reality, the user's physical head movements will naturally control the viewpoint, rendering only the WASD keys necessary.

The classroom environment is also a pivotal element, serving as the sole backdrop for our project. We will continually refine its details, with particular focus on lighting, aiming to strike a perfect balance. Proper lighting is also important for establishing the dark, gritty ambiance essential for conveying our message. This is because we want to convey fear and concern to our user. Furthermore, the detailing of the environment is crucial. It should be immersive enough that, through exploration, the user can start to understand that they are in a world full of killer robots. This entails elements like posters and drawings by students, warning acronyms, boarded-up windows, empty cubby spaces, and survivalist gear.

User interactivity is a core aspect of our project. We want to engage users by allowing them to interact with various environmental details, like posters. During the prototyping phase, we will ensure that these details are of high quality and easily readable.
Sound implementation is the final critical piece of our project. We have a couple of ideas in this regard. We plan to include voice lines through the classroom's PA system, delivering warnings about heightened killer robot presence. Additionally, we aim to incorporate a "buzzing" sound when the user approaches the windows to simulate the presence of a drone in the vicinity.

Prototyping test plan results :
Prototyping test plan for the first prototype :

Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method The classroom and some posters on the wall. - full classroom (with desks and chairs - coat hangers on the wall - the posters will be blank - the dimensions will be as high fidelity as possible	Description of Results to be Recorded and how these results will be used (How)	Estimated Test duration and planned start date (When)
1	To evaluate its feasibility	We will be testing this by counting the amount of time that is required for us to create this prototype. It should not take more than 3 days.	The result will be recorded in a table that will compare the time required for us to create this prototype and the time for us to create the others. It will then be compared with the other values of the other prototype to determine if it is feasible.	This test starts when we start building the prototype and ends when the prototype is finished.
2	Time duration of product	We will be testing this by roughly timing the time that it takes the camera to move throughout the scenarios. This should take us between 10 and 30 seconds, since there will be no interactions for this prototype.	We will do 5 trials, which use different combinations of pathways in order to find the most convenient and efficient one. This will be recorded by using a table, writing down the pathways used for each test and recording the amount of time elapsed.	The test duration should be about an hour. We will be satisfied when the time reaches 20 seconds or when 5 trials are done.
3	Ease of use	This will be tested by counting the amount of time elapsed in order to load the VR environment. It should be between 5 to 10 seconds. We will start a timer when the unity icon is clicked and stop it when the environment is fully loaded and the “play” button is pressed.	We will do 10 trials, to evaluate the consistency and the efficiency of the loading time. The results will be recorded using a table. We will also be recording any special conditions such as the wifi of the area.	The test duration will be about 1 hour. We will stop testing once we achieve 10 trials.
4	Precision of message/ focus on message:	This will be tested by showing people that we have identified in different user	We will have at least 10 feedback samples from this test. Each	The test duration will be when the

	Narrative effectiveness	personas, our prototypes and asking them 3 questions each : How concerned does this make you feel? Do you understand each of the steps? How much does this motivate you into taking action? Their response will be on a scale of 1 to 10. (1 being the lowest and 10 being the highest) And their suggestions will be noted. This can be done by either showing them the prototype or sending them a recording of it.	answer to the questions will be recorded using a table. We will make a mean of each column of the table to determine how successful or unsuccessful our product is.	prototype is finished to when the deliverable is due (time constraint). However, we do want a minimum of 10 feedback samples.
5	Overall Quality: of the video filmed.	This will be tested by using 2 methods to film our product and evaluating the quality of each. The first method will be screen recording with the computer. The second method will be to use teams as a method of screen recording. Then we will evaluate the frames per second of each method.	We will have a table for each method of screen recording. Each of them will be evaluated using 2 criteria and out of 10. The first is the FPS. The second will be the number of times it stops or glitches (for every stop and glitch it will be deducted 1 point).	The test duration will be about 1 hour and will end when both methods have been tried and tested 2 times each for the most accurate results.
6	Immersion of the user in their environment	This will be tested by showing people that we have identified in different user personas, our prototypes and asking them 3 questions each : How much do you feel immersed? Is this realistic to you? What could be improved? Their response will be on a scale of 1 to 10. (1 being the lowest and 10 being the highest) And their suggestions will be noted. This can be done by either showing them the prototype or sending them a recording of it.	We will have at least 10 feedback samples from this test. Each answer to the questions will be recorded using a table. We will make a mean of each column of the table to determine how successful or unsuccessful our product is.	The test duration will be when the prototype is finished to when the deliverable is due (time constraint). However, we do want a minimum of 10 feedback samples.

Results :

1. Evaluating feasibility :

It took us 3 days to complete the first prototype. This is very satisfactory, as it was a very comprehensive and medium fidelity prototype. This means that we are not expecting too much, by saying that we can improve on this prototype and deliver a more refined version by the end of the month. The prototype was low effort and did not cost anything. This proves again that it is very feasible within the time limit given.

2. Time duration of product :

For this trial, we had decided to use the camera to simulate a person walking around the classroom to all the important parts of the room. After reaching the location, the person is expected to remain there for 5 to 10 seconds. During the test, the walking was stopped for a random amount of time between 5 to 10 seconds. The list is :

1. Front of the class (teacher’s desk)

2. Mask shelf
3. ABC wall and Posters
4. Windows

From the results received, it is clear that we are on the right track for the time duration of the product, since our product needs to last about 30 seconds. However, it seems that it is sometimes longer than that. We will need to perform more tests later with a higher fidelity prototype to ensure that we do not exceed the time limit.

Trial index	Duration (s)	Combinations of paths taken
1	31.04	1 2 3 4
2	37.55	2 4 3 1
3	39.17	4 3 2 1
4	33.50	2 3 4 1
5	42.43	3 4 2 1

3. Ease of use :

This test was intended to determine the consistency of the loading time of the software. In order to keep results as accurate as possible, it was decided to perform this test on 3 different computers. The first one will be in green, the second will be in blue and the third in red. In general, the loading duration is 19.44 seconds. This data will be kept in order to estimate the amount of time taken to load the prototype on design day.

Trial index	Loading time (s)
1	23.60
2	18.32
3	25.43
4	20.17
5	12.01
6	18.56
7	15.78
8	17.84
9	19.43

10	19.03
Average	19.044

4. Precision of message

In order to get feedback for our project, we have decided to create user personas that would best fit with the different types of people destined to try our product. After doing so, we could now take their feedback and use it to increase the quality of our product. Creating user personas would also help us diversify the feedback given (so we avoid asking the same type of person for feedback).

Creating User Personas

Who are we designing for?

- The judges, professor and class

What they want to see:

- Decision makers: representation of a hypothetical free use of automated robots around the world. Show the destruction and consequences.
- Class, Regular person: interesting VR about automated robots
- Innovative and well structured VR that shows the consequences of automated robots (message).

User Personas	Goals	Personality	Activities	Sensibility
Lola (peace)	-Helping communities -spreading awareness about suffering	-Very involved -leader -concerned for others	-volunteering -spreadingawareness about violence -advocating for world peace	-high
Edward (decision makers)	-working in the government -earn money - managing a country	-fast paced environment -concerned for himself		-low
Regis (regular person)	-earn money - live peacefully	-Wants things done fast - Not much concern for others - Dislikes change in environment	-regular person activities	-moderate

Amy (army)	-learn about new weaponry in the army -help technological advances	- is intrigued by technological advances -is an engineer -Concerned about money	-researching tech -developing weaponry	-low

Questions :

1. How concerned does this make you feel?

2. Do you understand each of the steps?

3. How much does this motivate you into taking action?

Feedback giver number	User persona	Question 1 Grade (/10)	Question 2 Grade (/10)	Question 3 Grade (/10)
1	Regis	4	6	2
2	Regis	5	8	3
3	Lola	5	7	5
4	Lola	4	5	5
5	Regis	5	7	6
6	Regis	8	4	3

With this feedback, we are able to conclude that our prototype is not convincing enough. In fact, most feedback givers mentioned that it did not contain elements of robots. They also mentioned that without our explanations of the goal of our project, they would never be able to determine for themselves what the environment was made to depict. We can fix this issue by adding more detail to our environment and clues that would allude to what is happening in the classroom. We also need to amplify the feeling of fear that is meant to be felt, because most of the feedback givers mentioned that they are not prompted to act after watching the prototype.

5. Quality of video

Both videos were not optimal and glitched at least 4 times each. Now that we are aware of this, we will look for other software that could help us create a more optimal video experience. We are planning to do more research on the topic and test it on the next few deliverables. As for the screen recordings, there is a small difference between the methods used.

Teams recording : 6/10, 30 FPS
Computer recording : 5/10, 32 FPS

6. Immersion of the user in the environment

Questions :

1. How much do you feel immersed?
2. Is this realistic to you?
3. What could be improved?

Feedback giver number	User persona	Question 1 Grade (/10)	Question 2 Grade (/10)	Question 3
1	Regis	6	6	The lighting Making it look like a classroom for kids
2	Regis	5	7	The lighting
3	Lola	7	6	Adding more information about the robots
4	Lola	6	8	

The feedback given in this section is generally more positive. In fact the grades are much higher than in the previous section. This means that our product is very realistic and immersive. However, many mentioned that we should modify the lighting, making it more bright, as it was sometimes difficult for feedback givers to see the details. Also, others mentioned that the classroom did not fit the description of a kindergarten classroom, mostly because of the chairs and the position of the desks. Finally, a feedback giver also mentioned that it would be useful to add more information about the robot or that a robot should appear somehow.

Target specifications update :

We want to update the duration of loading for our product to make it about 20 seconds. This is because when testing our prototype, we had realized that it would take much longer for it to load. This is why, by looking at our test results, the new target specification will be that the product duration needs to be about 20 seconds.

Number	Specifications	Ideal measurements	Units	Verification method
6	Amount of images present of changes made by civilians to their environment	There must be between 3 and 7 images.	Number of images of examples	By counting the amount of examples that correspond to changes made by the civilians to their environment

BOM Update : **BOM - Deliverable E** **(Disregard the "E", this is the updated BOM for deliverable F)**

Prototypes:

Posters:
Drawing Board VR | Painting | Unity Asset Store

Hangers:
Clothes Hanger | 3D Clothing | Unity Asset Store

Masks:
PBR Plague Doctor Masks | Props | Unity Asset Store
Masks pack 2 | Props | Unity Asset Store
Free Japanese Mask | 3D Props | Unity Asset Store

Not free:
PBR Killer Masks | 3D Props | Unity Asset Store

Code to move camera around:
(wasd keys to move around, up down right left keys to change where the camera is looking)

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class MoveCamera : MonoBehaviour
{
    float turnSpeed = 100.0f; // Increased turn speed
    float moveSpeed = 10.0f; // Movement speed

    void Start()
    {
        // You can add any initialization code here if needed.
    }

    void Update()
    {
        // Camera looks in the direction of arrow key inputs
        if (Input.GetKey(KeyCode.RightArrow))
        {
```

```
    transform.Rotate(Vector3.up, turnSpeed * Time.deltaTime);
}
else if (Input.GetKey(KeyCode.LeftArrow))
{
    transform.Rotate(Vector3.up, -turnSpeed * Time.deltaTime);
}

// Get the WASD input for movement
float horizontalInput = 0;
float verticalInput = 0;

if (Input.GetKey(KeyCode.W))
{
    verticalInput = 1;
}
else if (Input.GetKey(KeyCode.S))
{
    verticalInput = -1;
}

if (Input.GetKey(KeyCode.A))
{
    horizontalInput = -1;
}
else if (Input.GetKey(KeyCode.D))
{
    horizontalInput = 1;
}

// Calculate the movement direction
Vector3 movement = transform.forward * verticalInput + transform.right * horizontalInput;

// Normalize the movement vector to ensure consistent speed in all directions
if (movement.magnitude > 1.0f)
{
    movement.Normalize();
}
```

```
        // Apply the movement in local space (horizontally)
        transform.Translate(movement * Time.deltaTime * moveSpeed, Space.World);
    }
}
```

Second prototyping test plan :

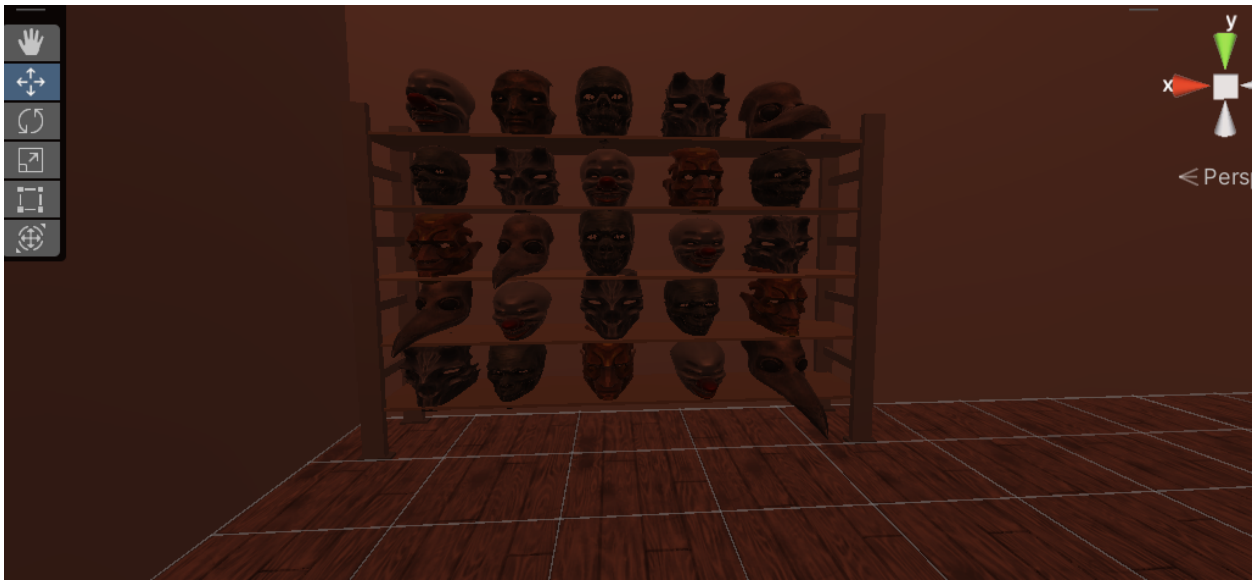
Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method The classroom and some posters on the wall. - full classroom (with desks and chairs - Shelves with masks on the wall - the posters will be blank - the dimensions will be as high fidelity as possible - Sound effects (ringing and message from the director) - Posters with drawings on them - ABC's on the walls - Camera that shifts with the arrow keys	Description of Results to be Recorded and how these results will be used (How)	Estimated Test duration and planned start date (When)
1	To evaluate its sound quality	We will be testing this by asking people to listen to our sound recordings and state what they hear and how clearly they can hear it.	This will be recorded using a table, which will contain the list of feedback givers asked, their ratings of the sounds from 1 to 10 and their understanding of it. We will test this feature at least 5 times.	The test duration should be about 3 days. It will start immediately after the sound effects are implemented in the prototype.
2	Time duration of product	We will be testing this by roughly timing the time that it takes the camera to move throughout the scenarios. This should take us between 30 and 40 seconds, since there will be no interactions for this prototype.	We will do 5 trials, which use different combinations of pathways in order to find the most convenient and efficient one. This will be recorded by using a table, writing down the pathways used for each test and recording the amount of time elapsed.	The test duration should be about an hour. We will be satisfied when the time reaches 20 seconds or when 5 trials are done.
3	Precision of message/ focus on message: Narrative	This will be tested by showing people that we have identified in different user personas, our posters and asking them 3 questions each :	We will have at least 10 feedback samples from this test. Each answer to the	The test duration will be when the prototype is finished

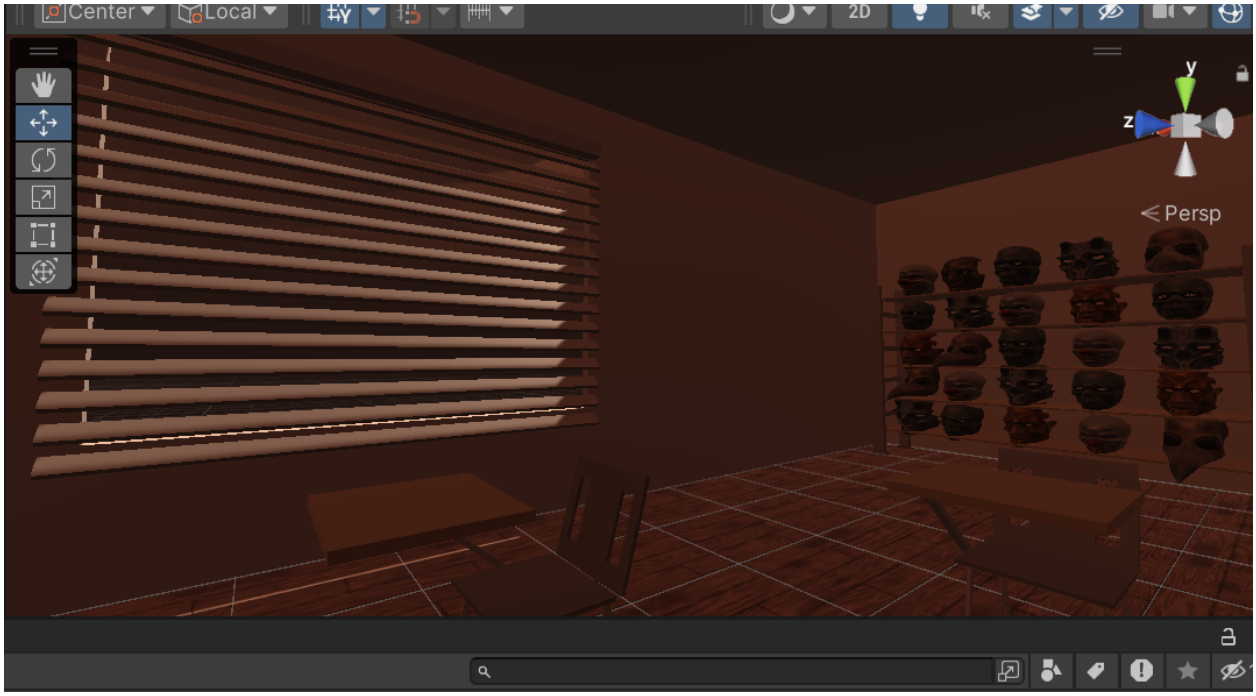
	effectiveness for the posters	How concerned does this make you feel? Do you understand each of the steps? How much does this motivate you into taking action? Their response will be on a scale of 1 to 10. (1 being the lowest and 10 being the highest) And their suggestions will be noted. This can be done by either showing them the prototype or sending them a recording of it.	questions will be recorded using a table. We will make a mean of each column of the table to determine how successful or unsuccessful our product is.	to when the deliverable is due (time constraint). However, we do want a minimum of 10 feedback samples.
5	Immersion of the user in their environment	This will be tested by showing people that we have identified in different user personas, our prototypes and asking them 3 questions each : How much do you feel immersed? Is this realistic to you? What could be improved? Their response will be on a scale of 1 to 10. (1 being the lowest and 10 being the highest) And their suggestions will be noted. This can be done by either showing them the prototype or sending them a recording of it.	We will have at least 10 feedback samples from this test. Each answer to the questions will be recorded using a table. We will make a mean of each column of the table to determine how successful or unsuccessful our product is.	The test duration will be when the prototype is finished to when the deliverable is due (time constraint). However, we do want a minimum of 10 feedback samples.

Prototype screenshots:
classroom:

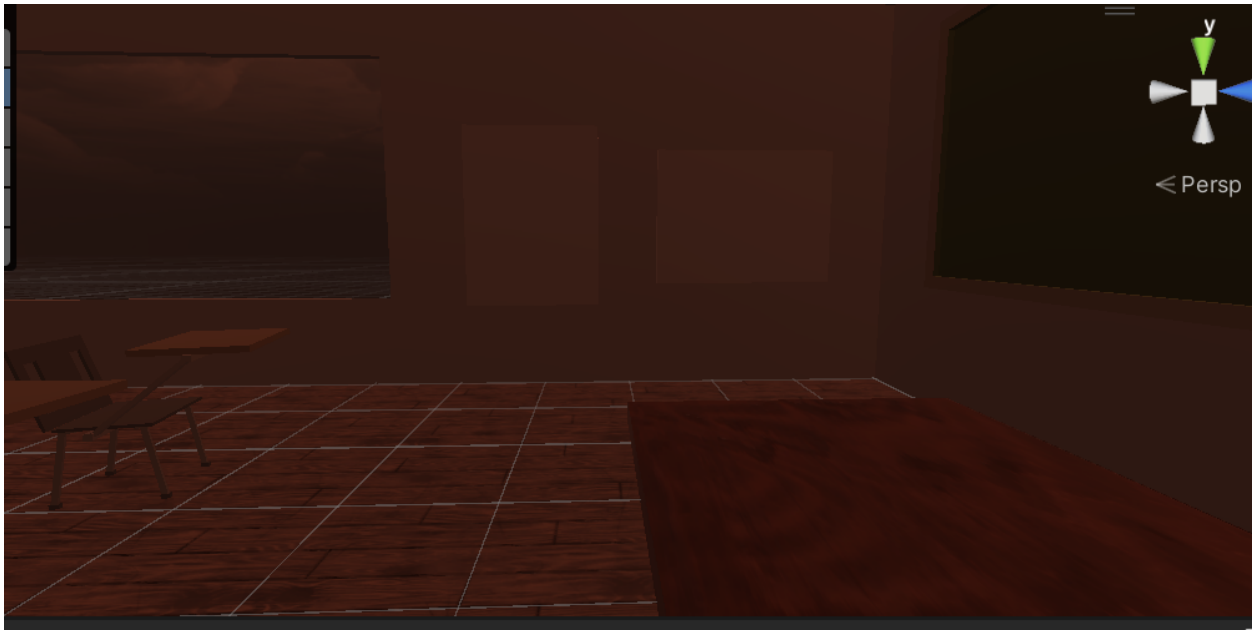
Mask shelf:

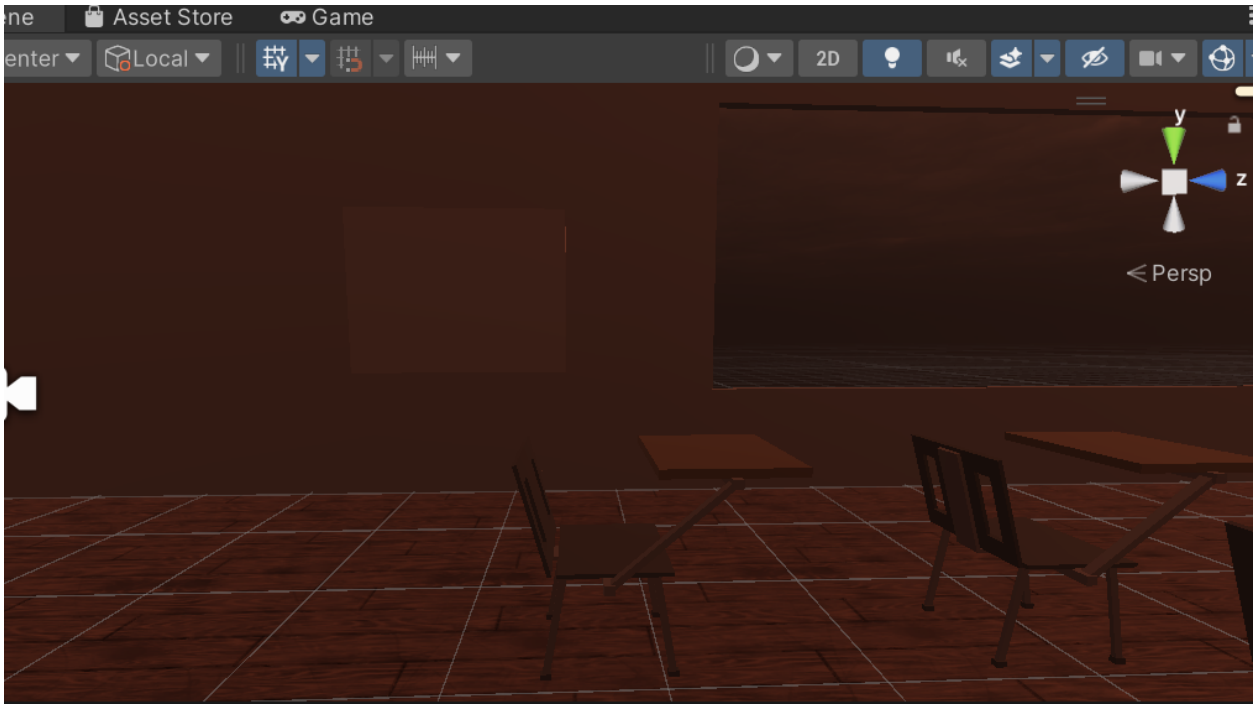

y
z
x
Persp


y
x



Blank posters:


y
Persp


Asset Store
Game
Local
2D
y
z
Persp