Interface Design

LAB8: Working with canvases

Learning Objectives:

By the end of this tutorial you will be able to:

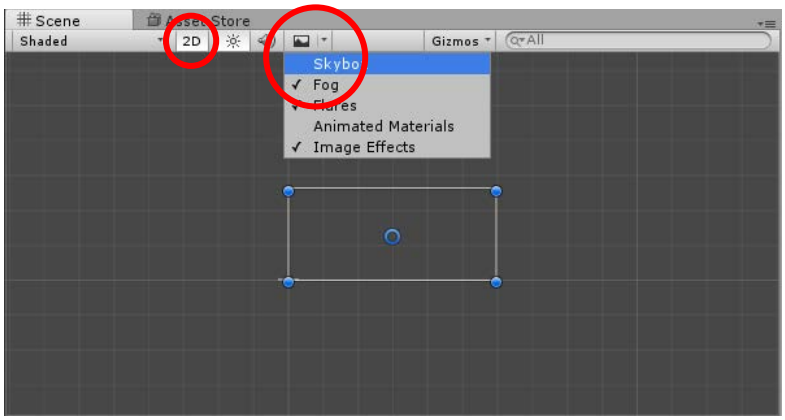
- Create and edit canvas element in Unity
- Use different types of canvases (Render modes)
- Set up and test the canvas and its elements for screen independence

Notes:

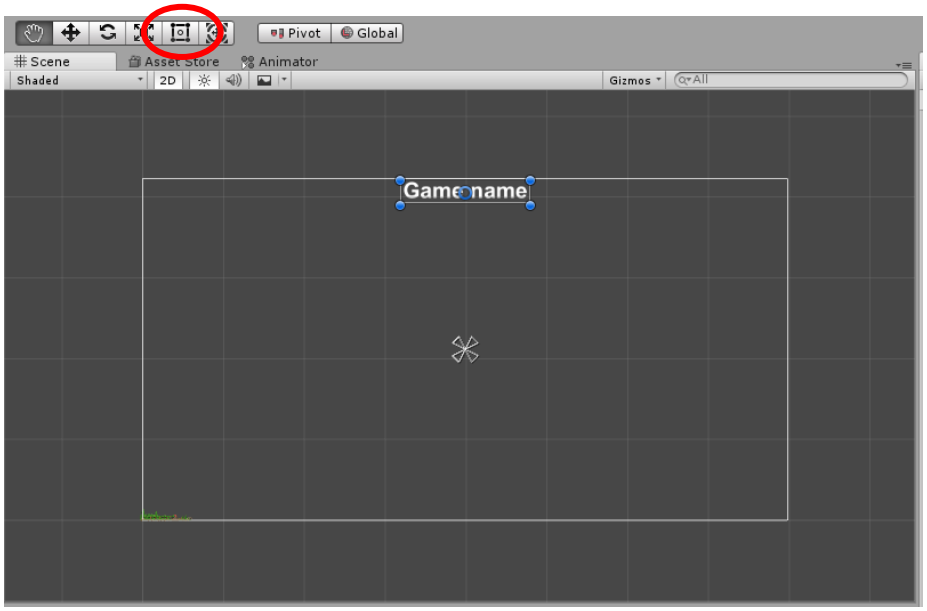
- *The Canvas is the area in which all UI elements should reside*
- *The Canvas is a Game Object with a Canvas component on it*
- *All UI elements must be children of a Canvas Game Object*
- *Creating a new UI element automatically creates a Canvas if there isn't already a Canvas in the scene*
- *The Canvas area is shown as a rectangle in the Scene View*
- ***Render Mode:***
    - ***Screen Space – Overlay**: UI elements placed on top of the scene. If the screen is resized the Canvas automatically changes size to match this.*
    - ***Screen Space – Camera**: Canvas is placed a given distance in front of a specified Camera. The UI elements are rendered by this camera – the Camera settings affect the appearance of the UI.*
    - ***World Space**: Canvas behaves as any other object in the scene. The size of the Canvas can be set manually using its Rect Transform*

Task 1: Creating a simple Canvas (Screen Space – Overlay)

1. Download and import SimpleLevelCollectables Unity package from Brightspace
2. Open the DataPersistence Scene
3. Create a new canvas Game Object in the Hierarchy (Create -> UI -> Canvas) and name it Canvas-Overlay
    - Creating Canvas object creates an EventSystem object with it.
4. Switch to 2D view mode by clicking on "2D" button in the Scene view toolbar (see below) and turn off the Skybox by deselecting it in the Effects drop-down menu (see below)
    - Canvas is probably much larger than your level as it uses 1:1 pixel mapping (1 Unity unit = 1 pixel)



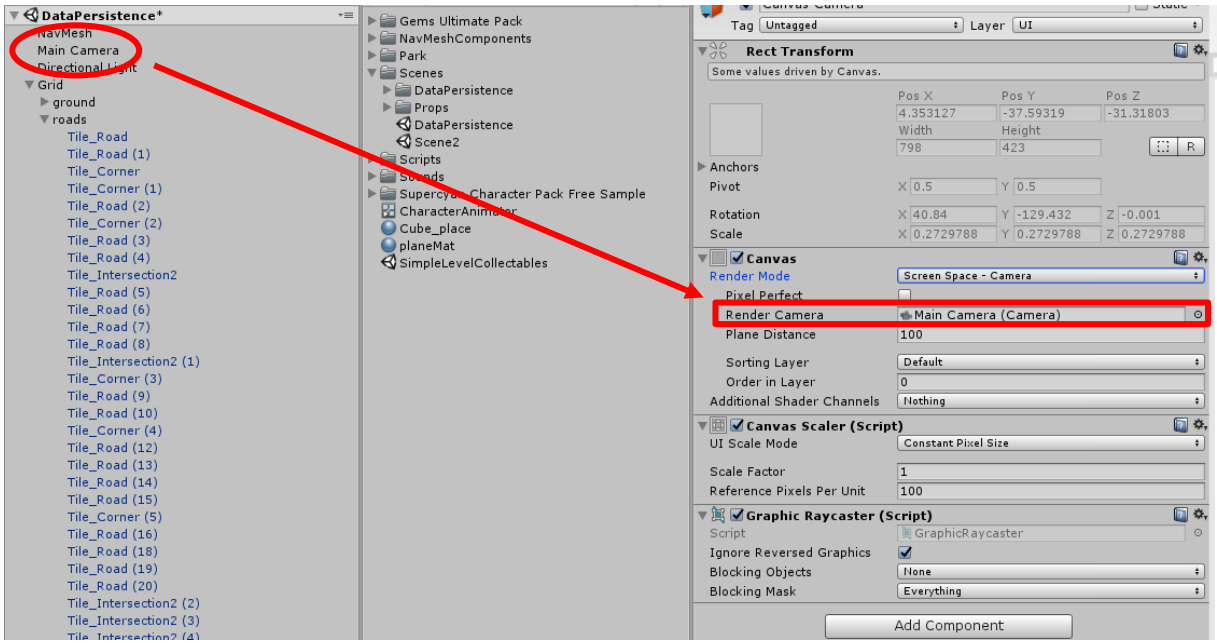
5. In the Canvas component of the Canvas object tick the “Pixel Perfect” checkbox for better rendering of canvas elements
6. Create a UI Text element
7. Using the Rect Tool (see below) and by changing its attributes in the Inspector (Text, Character properties, Paragraph properties, etc.) adjust it so it looks something like this



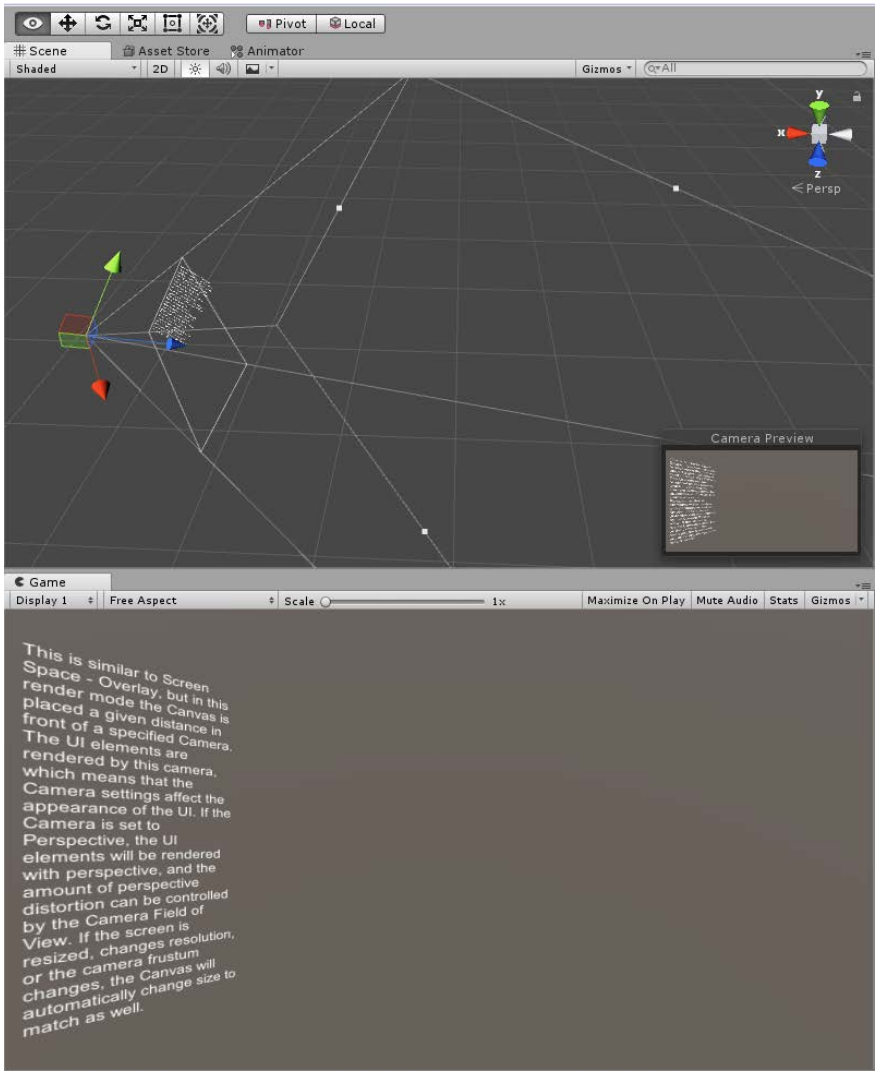
8. Add a few more **text UI elements** and format them as you like.
9. Test the game
    - Select your Main Camera and move it. See what happens with the UI text.

Task 2: Creating a new Canvas (Screen Space – Camera)

1. Create a new canvas Game Object in the Hierarchy and name it Canvas-Camera
2. In the Inspector, under the Canvas component, change Render Mode to “Screen Space – Camera”
3. Drag and Drop the Main Camera from the hierarchy to Render Camera slot in the Inspector



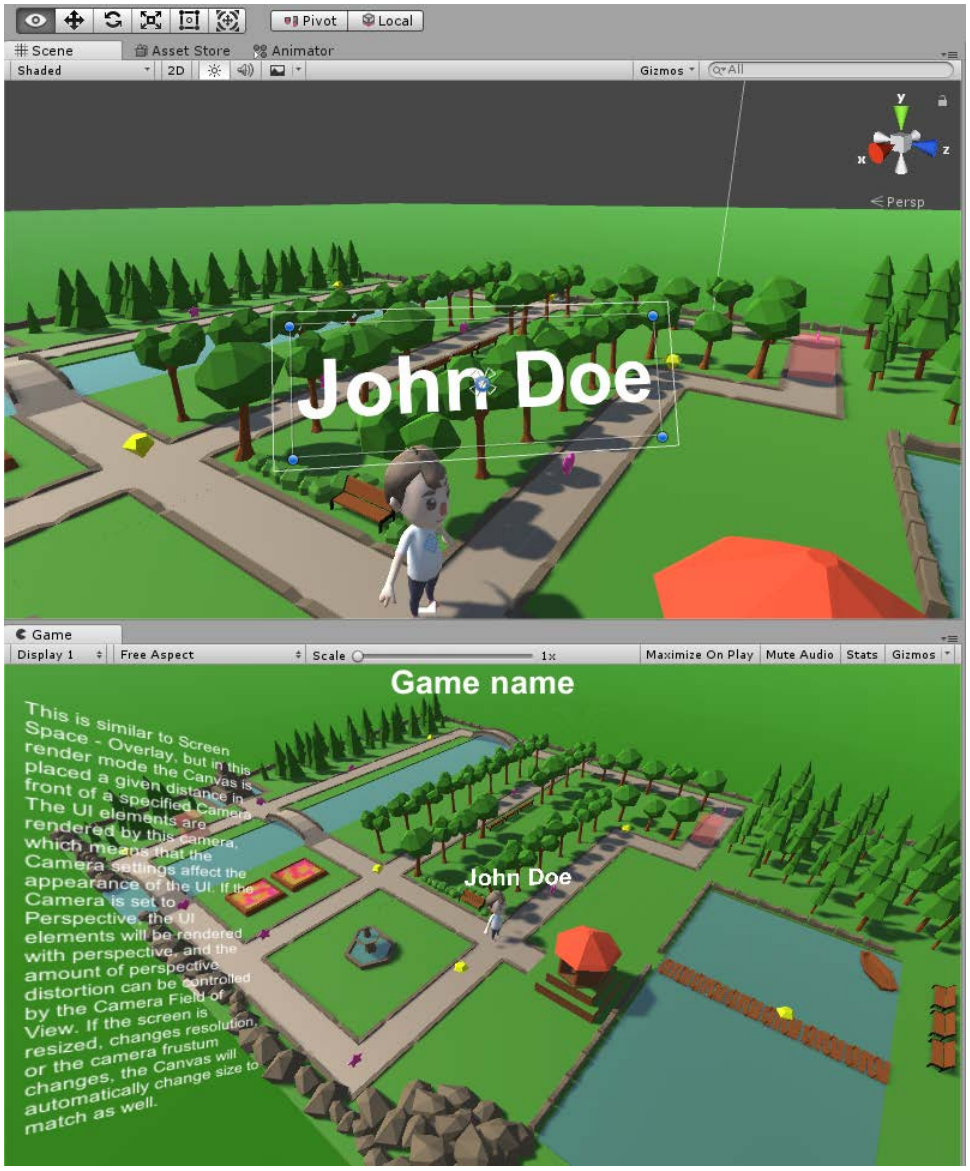
4. Create a Text UI element by right clicking on the Canvas-Camera object -> UI -> Text
5. Now that the canvas is attached to your camera frustum, try setting the Text UI element as shown in figure below
    - To do this, try using both Rect tool and 3D Rotate tool
    - If you can't see the canvas try moving it closer by changing Plane Distance attribute in Canvas Component in the Inspector



6. Test the game and try modifying camera (move, rotate, field of view, etc.)

Task 3: Creating a new Canvas (World Space)

1. Select you player character (MaleFreeSimpleMovement1 object)
2. Right Click -> UI -> Canvas to create a new canvas Game Object as a child of the player object
3. Rename it Canvas-World
4. In the Inspector, under the Canvas component, change Render Mode to "World Space"
5. Drag and Drop the Main Camera from the hierarchy to Render Camera slot in the Inspector
6. Add a Text UI element to the canvas
7. By using 2D (Rect tool) and 3D transform tools, adjust the canvas and the text UI as shown below



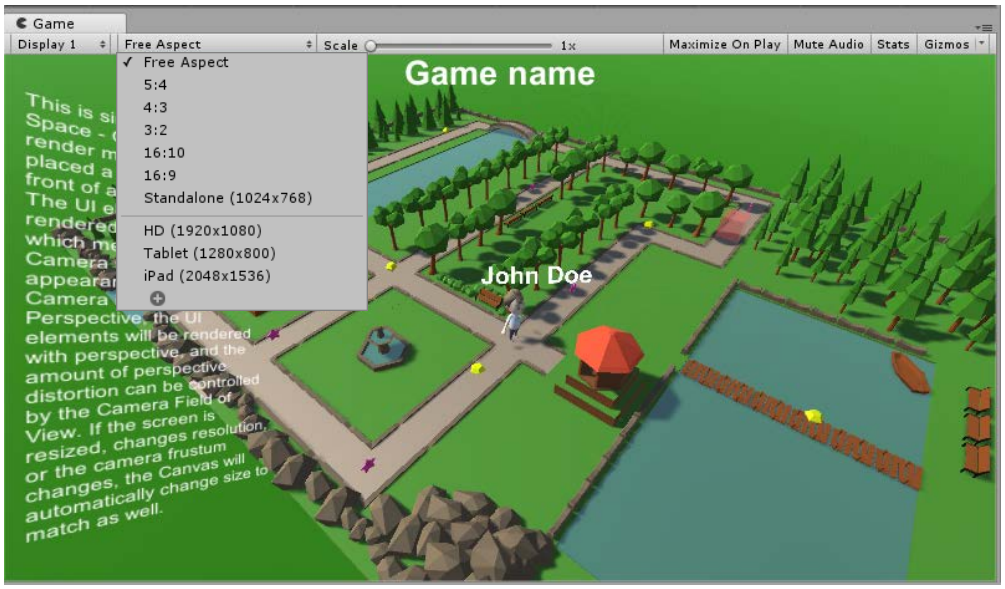
8. Test the game – move the character around
9. Create a RotateCanvas script on the Canvas-World object and add the following code to it

```
Quaternion rotation;

void Start () {
    rotation = transform.rotation;
}

void Update () {
    transform.rotation = rotation;
}
```

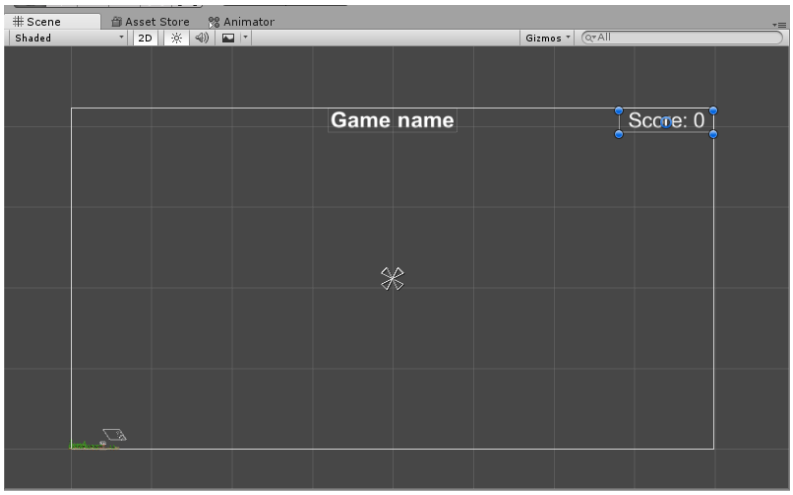
10. Test the game again

Task 4: UI element anchoring + Canvas Scaler

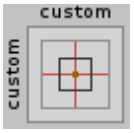
1. In the Game panel, click on the “Free Aspect” drop-down menu and add three screen resolution:
    - HD (1920x1080)
    - Tablet (1280x800)
    - iPad (2047x1536)



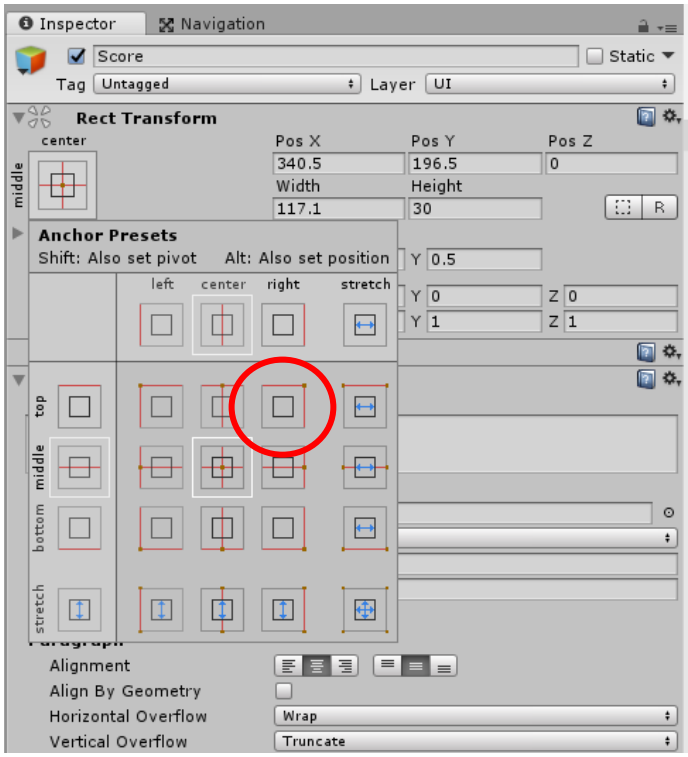
2. Select the first Canvas you created (Canvas-Overlay)
    - Go to 2D mode to work with it
3. Add a new text element to it (name it Score)
4. Set its text to “Score: 0” in the Inspector and move it to the top right corner of the canvas



5. Test the game
    - In the Game panel try changing the screen resolution to the ones you created in step_1
    - Check what happens with the UI elements
6. Select the Score text object

7. In the Rect Transform component (in the Inspector) click on the 

icon and select the top right position to set the Score anchor



- *This ensures that the UI elements remain at the same positions relative to their anchors when the screen size and ratio change.*

8. Test the game (change the resolutions to what happens with the score)
9. To fix the change of the size of the UI elements adjust the parameters of the Canvas Scaler (check Unity reference for help)
10. Repeat step 7 for “Game name” text element
11. Repeat step 7 and 9 for “Canvas-Camera” object