Web Games

Week 6 - 3D & Multiplayer Features

Objectives

- Explore Constructs 3D Features
  - Z Elevation
  - 3D Object
  - 3D Camera
- Understand how Multiplayer works
- Get feedback on the first assessment

1. 3D Features

3D in Construct

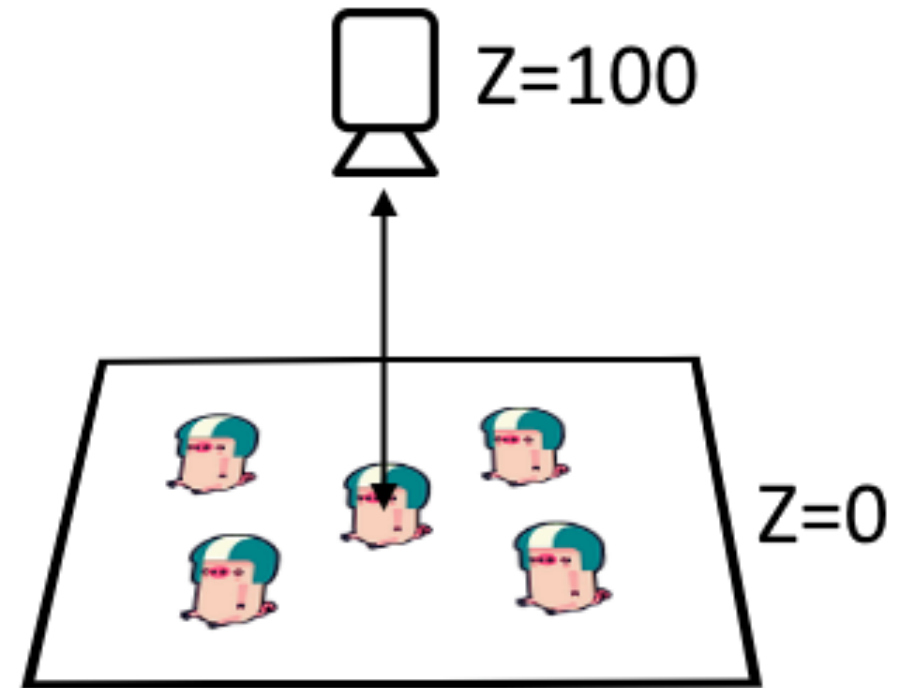Primarily a 2D game making engine Construct has features that allow you to create 3D games

- Z Elevation
- 3D Object
- 3D Camera
- Third party addons

Construct Camera

All construct games are actually rendered in a 3D world. The camera sits at a Z elevation of 100 and points down onto a 2D canvas at Z elevation 0.
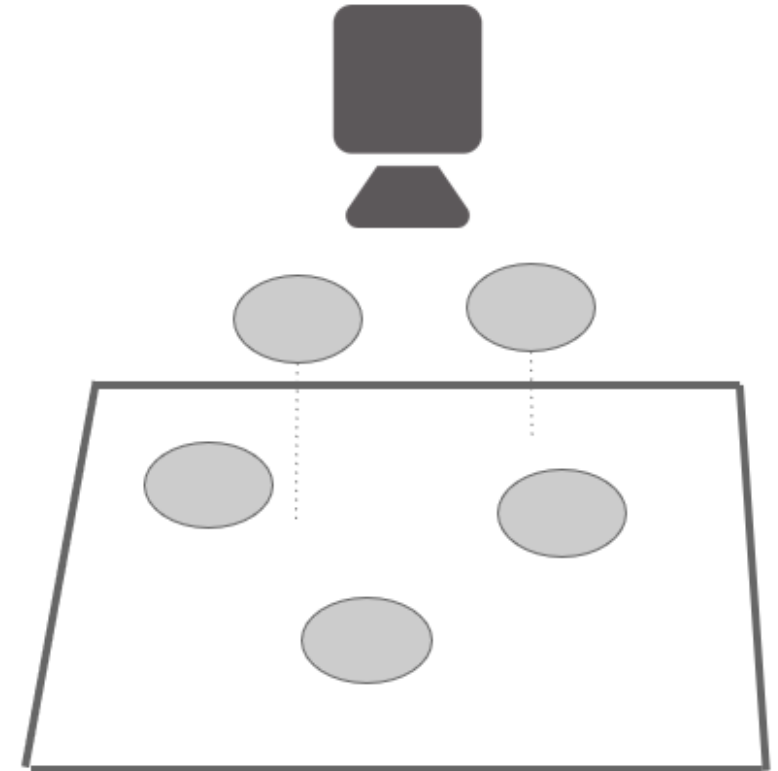
Z Elevation

Due to how all games are rendered in a 3D world Construct has always had some level of 3D provided through Z elevation

Z elevation allows you to move objects along the Z axis and therefore move objects closer of further away from the camera.

3D Shape

- Adds basic 3D shape to games
  - Box, Prism, Cone & Wedge.
- Can add "textures" to the shape faces
- Depth of shape controlled via z height
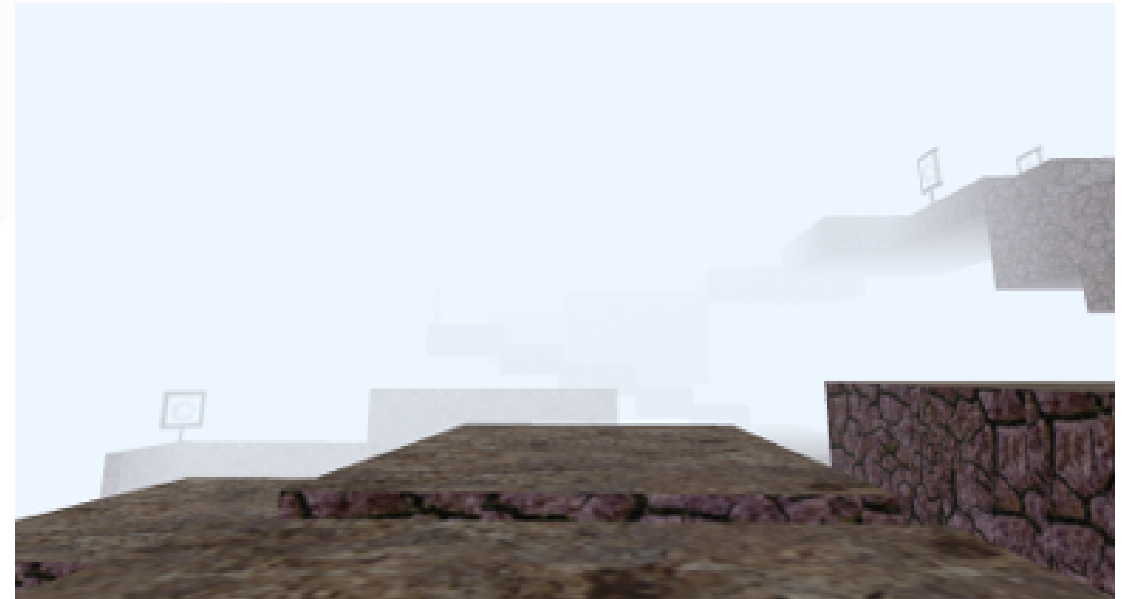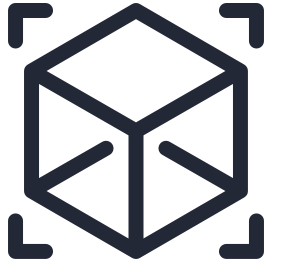- Collisions not affected by Z elevation changes

3D Camera

The 3D Camera object allows you to modify the usual position and angle of the games camera and move it anywhere in the 3D world.

Moving the camera can quickly change a 2D game to 3D and completely modify the experience

Docs & Examples

- [Using 3D in Construct](#)

- Search '3D' and 'Z Elevation' in the examples browser

2. Multiplayer

Multiplayer in Construct

The multiplayer object in Construct provides features that allow real-time online multiplayer games.

The object makes use of **WebRTC API** to provide real-time communications and transmit game data between peers

Signalling

Scirra (the makers of Construct) provide a signalling server you can use for players to connect to each other. Players must connect to this signalling server before then joining a game "room". The signalling server handles these connections.

Multiple games may be using this signalling server. To ensure players are allocated to the right game you need to give your game a unique name..

You can run multiple instances of your game (e.g. "Stable" vs "Beta" or "Europe" vs "America").

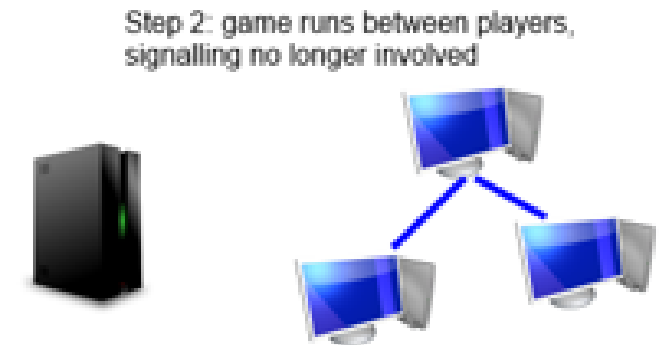# Why might you want to run multiple instances of your game?

Player Connections

The first player in a room becomes the host and acts as the server to transfer game data to other players.

All game information must be relayed through the host.

To keep games updated broadcast messages that are sent from the host to every player.

Step 1: players meet on the signalling server

Signalling server

Step 2: game runs between players, signalling no longer involved

Connection Quality

It takes time for messages sent between players to arrive. Even players in close proximity should expect a delay in transmission (known as latency). The further the distance between players the larger this delay is likely to be.

Due to latency within games messages sent between players may arrive at inconsistently. Hosts will always have a slight gameplay advantage as they experience zero latency.

Multiplayer Flow

The lifecycle of a multiplayer game in Construct looks like this:

- Connect to signalling room and login

- Join a room

- Wait for peers to join and begin game

- Object data and meesages exchanged between peers

- Game ends and players leave the room

Games end instantly if the host leaves, but other players can leave at anytime

Multiplayer Documentation

The events, conditions and expressions that come with the multiplayer object are extensive and creating multiplayer games can become complex.

For further reading I recommend the official documentation on the multiplayer object, as well as the tutorials and further examples provided by Construct...

https://www.construct.net/en/make-games/manuals/construct-3/plugin-reference/multiplayer

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Multiplayer Demo

On Ultra you can find a video tutorial on implementing Multiplayer. This demo creates a multiplayer quiz game and demonstrates the following features

- Logging players in and connecting them via signalling server
- Sending messages between players
- File handling using the JSON object to read in quiz data

The demo materials include a video and commented Construct project file

3. Assessment Feedback

Contextualising Statement

The contextualising statement assessment is due this Friday:

7th November, 11:59am

Use the time in today's session to get feedback or book a tutorial

Research & Development

Use the remainder of the session for research & development:

- Explore construct

- Rapid prototype game ideas

- Ideate for the playable prototype assessment

- Test mechanics for your playable prototype

- Get feedback on the Contextualising Statement assessment

Up Next...

Prototyping