A-Frame ENVIRONMENT AND AUDIO

What is our GOAL for this MODULE?

We learned about the A-Frame environment component, audio asset management in A-Frame, and how to play sound using the sound component methods.

What did we ACHIEVE in the class TODAY?

- Learned about the A-Frame environment component.
- Learned about the A-Frame audio assets.
- Learned to use sound component methods.

Which CONCEPTS/CODING BLOCKS did we cover today?

- document.querySelector('')
- .addEventListener(), setAttribute(),getAttribute(), .registerComponent() methods
- A-Frame environment component

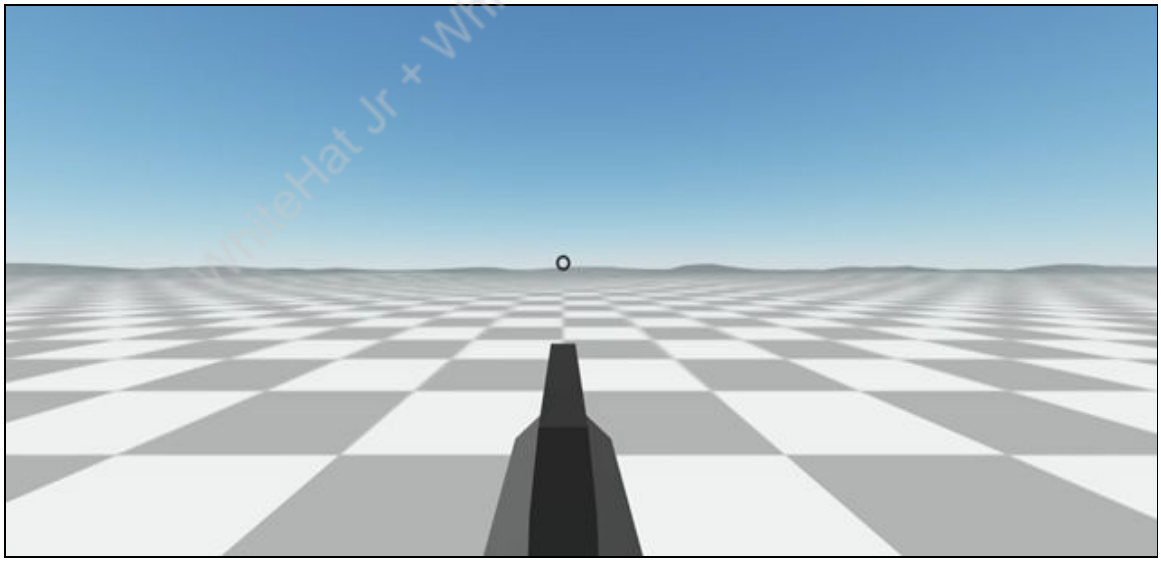
How did we DO the activities?

1. Include the “aframe-environment-component” library in index.html.

```
<head>
  <title>Shooting Game in Virtual Reality</title>
  <script src="https://aframe.io/releases/1.0.4/aframe.min.js"></script>
  <script src="https://cdn.jsdelivr.net/gh/n5ro/aframe-physics-system@v4.0.1/dist/aframe-physics-system.min.js"></script>
  <script src="https://unpkg.com/aframe-physics-extras@0.1.2/dist/aframe-physics-extras.min.js"></script>

  <script src="https://unpkg.com/aframe-environment-component@1.1.0/dist/aframe-environment-component.min.js"></script>

  <script src="./shoot.js"></script>
```

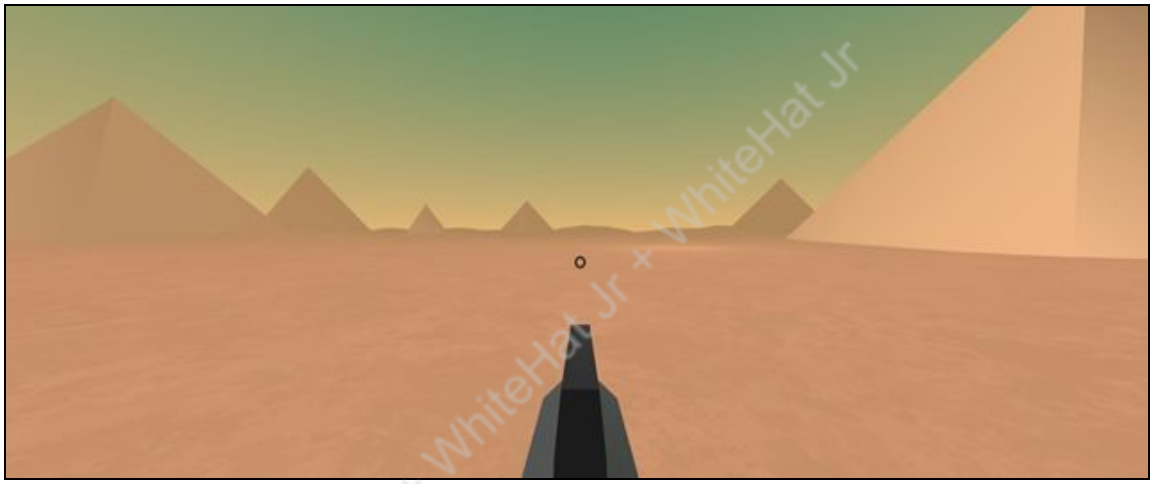
2. Attach the environment component to the scene using <a-entity> tag.

```
<!--A-Frame Environment-->
<a-entity id="environment" environment>
</a-entity>
```



3. Add the preset, skyType, and lighting properties of the environment component.

```
<!--A-Frame Environment-->
<a-entity id="environment" environment="preset: egypt; skyType:gradient; lighting:point">
</a-entity>
```



4. Create a basic military shooting scene:
    - Create the gameObjects.js file and add it to the index.html.

```
<script src="./shoot.js"></script>

<script src="./gameObjects.js"></script>
```

    - Add the “wire-fence” component.

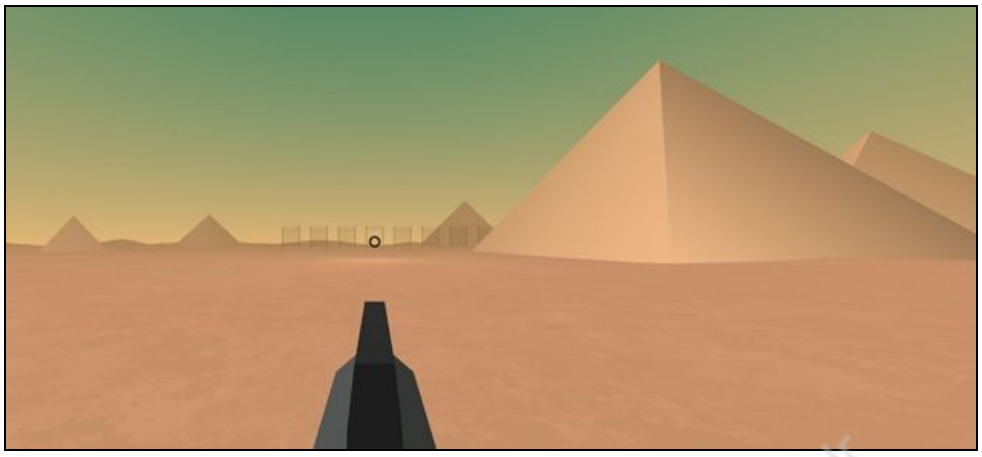
```
AFRAME.registerComponent("wire-fence", {

});
```

- Attach the component to the entity.

```
<!--Game Objects-->
<a-entity wire-fence></a-entity>
```

5. Add the for loop to create an entity and set its properties using setAttribute().

```
AFRAME.registerComponent("wire-fence", {
  init: function () {
    //starting x position
    posX = -20;
    for (var i = 0; i < 10; i++) {
      //create wire-fence entity
      var wireFence1 = document.createElement("a-entity");

      //set x, y and z position
      posX = posX + 5;
      posY = 2.5;

      //scale
      var scale = { x: 2, y: 2, z: 2 };

      //set the id
      wireFence1.setAttribute("id", "wireFence1" + i);

      //set the position
      wireFence1.setAttribute("position", { x: posX, y: 2.5, z: -35 });

      //set the scale
      wireFence1.setAttribute("scale", scale);

      //set the model
      wireFence1.setAttribute(
        "gltf-model",
        "./models/barbed_wire_fence/scene.gltf"
      );

      //set the physics body
      wireFence1.setAttribute("static-body", {});

      var sceneEl = document.querySelector("#scene");
      //attach the entity to the scene
      sceneEl.appendChild(wireFence1);
    }
```



6. Create a fence boundary on the other three sides and set the attributes of these wire fences also.

```
//create wire-fence entity
var wireFence1 = document.createElement("a-entity");
var wireFence2 = document.createElement("a-entity");
var wireFence3 = document.createElement("a-entity");
var wireFence4 = document.createElement("a-entity");
```

```
//starting z-position
posZ = 85;
```

```
//set x, y and z position
posX = posX + 5;
posY = 2.5;
posZ = posZ - 10;
```

```
//set the id
wireFence1.setAttribute("id", "wireFence1" + i);
wireFence2.setAttribute("id", "wireFence2" + i);
wireFence3.setAttribute("id", "wireFence3" + i);
wireFence4.setAttribute("id", "wireFence4" + i);

//set the position
wireFence1.setAttribute("position", { x: posX, y: 2.5, z: -35 });
wireFence2.setAttribute("position", { x: posX, y: 2.5, z: 85 });
wireFence3.setAttribute("position", { x: -30, y: 2.5, z: posZ });
wireFence4.setAttribute("position", { x: 50, y: 2.5, z: posZ });

//set the scale
wireFence1.setAttribute("scale", scale);
wireFence2.setAttribute("scale", scale);
wireFence3.setAttribute("scale", scale);
wireFence4.setAttribute("scale", scale);
```

7. Set the gLTF model attribute for each fence.

```
//set the model
wireFence1.setAttribute(
  "gltf-model",
  "./models/barbed_wire_fence/scene.gltf"
);

wireFence2.setAttribute(
  "gltf-model",
  "./models/barbed_wire_fence/scene.gltf"
);

wireFence3.setAttribute(
  "gltf-model",
  "./models/barbed_wire_fence/scene.gltf"
);

wireFence4.setAttribute(
  "gltf-model",
  "./models/barbed_wire_fence/scene.gltf"
);
```

8. Set the rotation of two wire-fences to 90 degrees on y-axis to make them vertical and the static-body attribute; also append the entities to the scene element.

```
//set the rotation
wireFence3.setAttribute("rotation", { x: 0, y: 90, z: 0 });
wireFence4.setAttribute("rotation", { x: 0, y: 90, z: 0 });
```

```
//set the physics body
wireFence1.setAttribute("static-body", {});
wireFence2.setAttribute("static-body", {});
wireFence3.setAttribute("static-body", {});
wireFence4.setAttribute("static-body", {});

var sceneEl = document.querySelector("#scene");
//attach the entity to the scene
sceneEl.appendChild(wireFence1);
sceneEl.appendChild(wireFence2);
sceneEl.appendChild(wireFence3);
sceneEl.appendChild(wireFence4);
```

9. Add the shooting sound and set the properties of the sound component.

```
<!--Assets-->
<a-assets>
  <a-asset-item id="shooter" src="./models/shooter/gun.gltf"></a-asset-item>

  <audio id="shoot" src="./sounds/shoot.mp3"></audio>

</a-assets>
```

```
<!--Sounds-->
<a-entity id="sound1" sound="src: #shoot; poolSize:2; autoplay: false; volume: 1;loop:false"></a-entity>
```

10. Write a function shootSound() in the shoot.js file and call it.

```
shootSound: function () {
  var entity = document.querySelector("#sound1");
  entity.components.sound.playSound();
},
```

```
  scene.appendChild(bullet);

  //shooting sound
  this.shootSound();
}
```

11. Add “boxes” components to add the boxes at random positions and attach the components in the index.html file.

```
//boxes
AFRAME.registerComponent("boxes", {
  schema: {
    height: { type: "number", default: 3 },
    width: { type: "number", default: 3 },
    depth: { type: "number", default: 3 },
  },
  init: function () {
    for (var i = 0; i < 20; i++) {
      var box = document.createElement("a-entity");
      box.setAttribute("id", "box" + i);

      posX = Math.random()*200 -100;
      posY = 1.5;
      posZ =Math.random()*200 -100;

      position = { x: posX, y: posY, z: posZ };
      box.setAttribute("position", position);

      box.setAttribute("geometry", {
        primitive: "box",
        height: this.data.height,
        width: this.data.width,
        depth: this.data.depth,
      });

      box.setAttribute("material", {
        src: "./images/boxtexture1.jpg",
        repeat: "1 1 1",
      });

      box.setAttribute("static-body", {});
      var sceneEl = document.querySelector("#scene");
      sceneEl.appendChild(box);
    }
  },
});
```

```
<!--Game Objects-->
<a-entity wire-fence boxes></a-entity>
```

12. Add the footsteps sound.

```
<!--Assets-->
<a-assets>
  <a-asset-item id="shooter" src="./models/shooter/gun.gltf"></a-asset-item>

  <audio id="footstep" src="./sounds/footStep.mp3"></audio>

  <audio id="shoot" src="./sounds/shoot.mp3"></audio>

</a-assets>
```

13. Add the sound file path using <audio> in <a-assets> and add the sound source using <a-entity> and set it's attribute.

```
<!--Assets-->
<a-assets>
  <a-asset-item id="shooter" src="./models/shooter/gun.gltf"></a-asset-item>

  <audio id="footstep" src="./sounds/footStep.mp3"></audio>

  <audio id="shoot" src="./sounds/shoot.mp3"></audio>

</a-assets>
```

```
<!--Sounds-->
<a-entity id="sound1" sound="src: #shoot; poolSize:2; autoplay: false; volume: 1;loop:false"></a-entity>
<a-entity id="sound2" sound="src: #footstep; poolSize:2;autoplay: false; volume: 4;loop:false"></a-entity>
```

14. Add the playerMovement.js file to add the “player-movement” component and attach the component to the weapon entity.

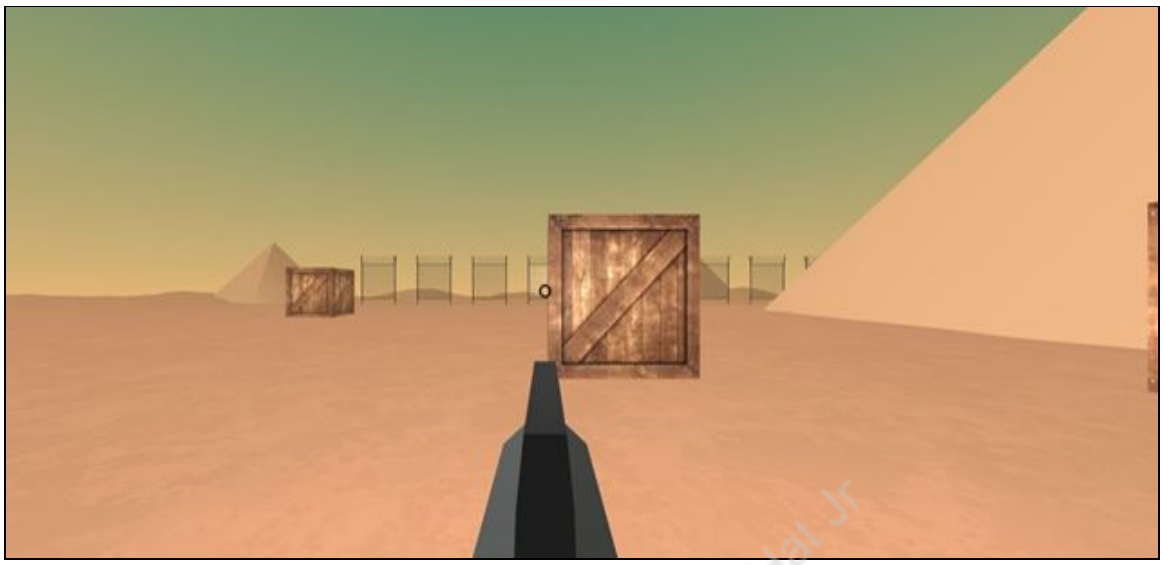
```
<script src="./playerMovement.js"></script>
```

```
AFRAME.registerComponent("player-movement", {

});
```

```
<!--Camera and Cursor-->
<a-entity id="camera" camera position="0 1.6 0" wasd-controls look-controls="pointerLockEnabled: false">
  <a-entity id="weapon" gltf-model="#shooter" position="0 -4.4 3" rotation="0 180 0" scale="0.35 1 1"
    player-movement>
  </a-entity>
  <a-cursor></a-cursor>
</a-entity>
```

15. Write a play sound when arrow keys are pressed.

```
AFRAME.registerComponent("player-movement", {
  init: function () {
    this.walk();
  },
  walk: function () {
    window.addEventListener("keydown", (e) => {
      if (
        e.key === "ArrowUp" ||
        e.key === "ArrowRight" ||
        e.key === "ArrowLeft" ||
        e.key === "ArrowDown"
      ) {
        var entity = document.querySelector("#sound2");
        entity.components.sound.playSound();
      }
    });
  },
```



We have successfully learned to make the military shooting practice area.

What's NEXT?

In the next class, we will be learning to navigate in the game using navigation meshes, and also fix the bugs in the game.

EXTEND YOUR KNOWLEDGE:

- You can refer to the below link to explore more about A-Frame.
  A-Frame Audio Asset
- You can refer to the link below to explore more about A-Frame environment component Link.
  A-Frame environment component