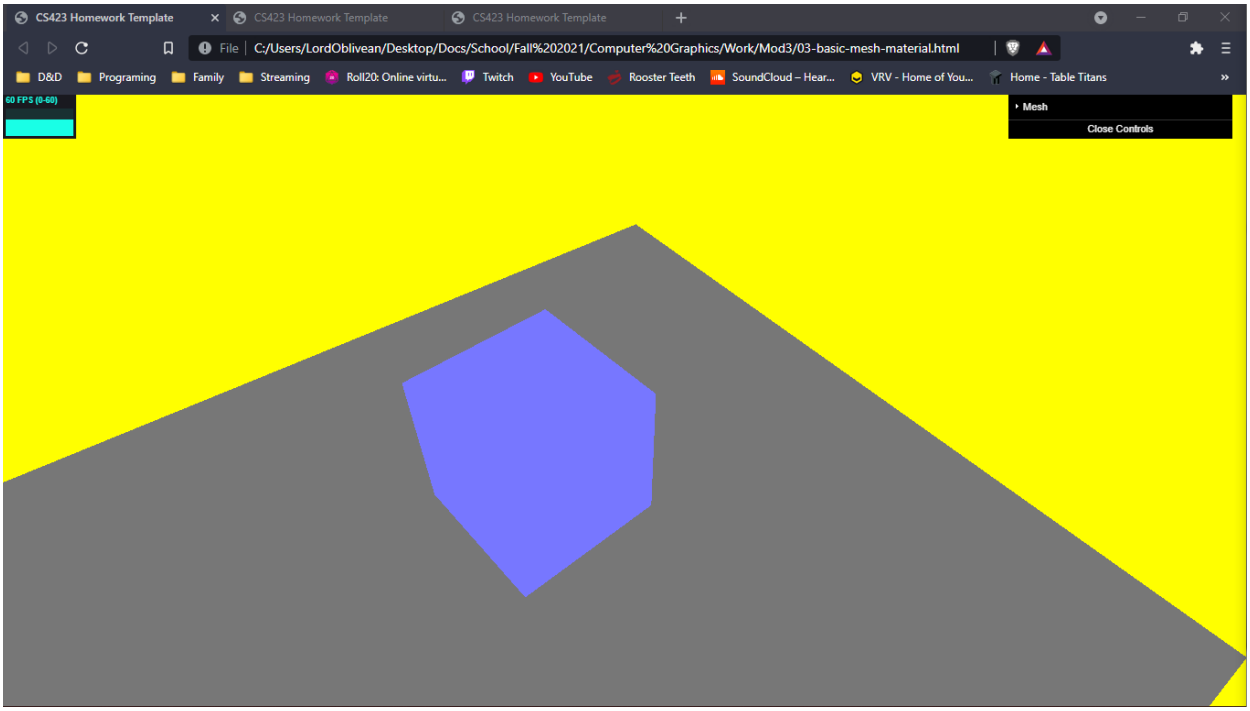
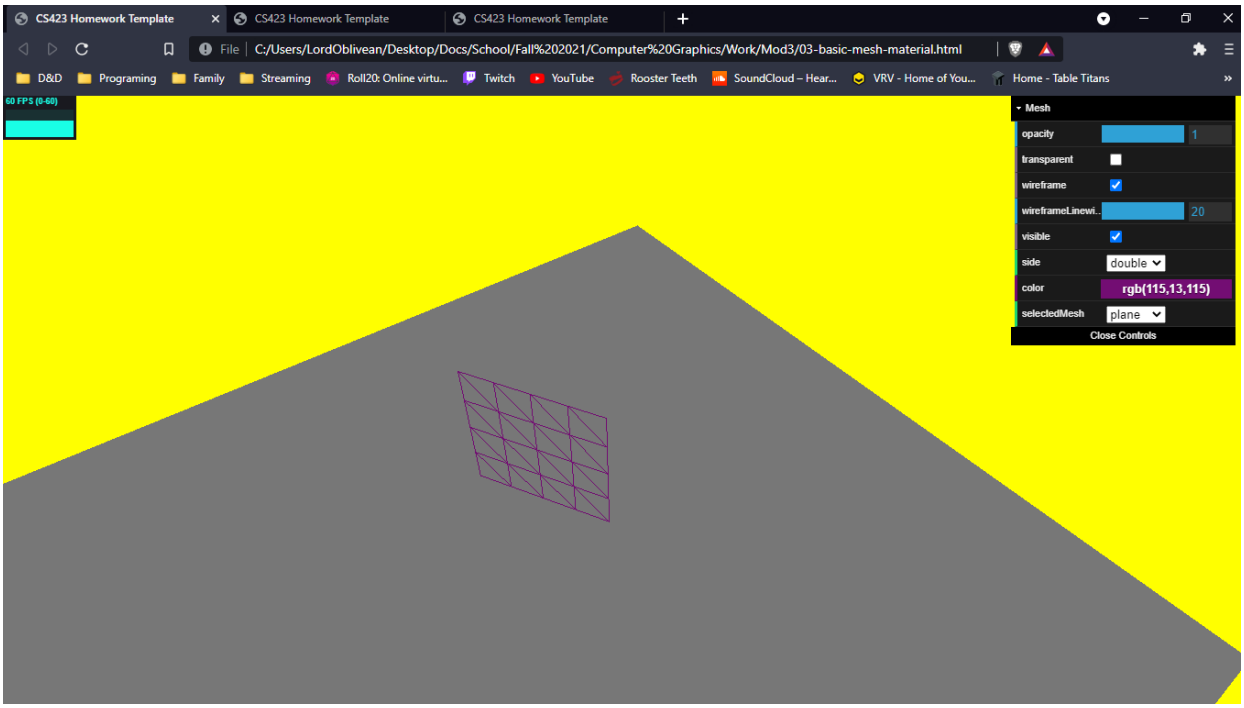
Devin Hardy

00076619

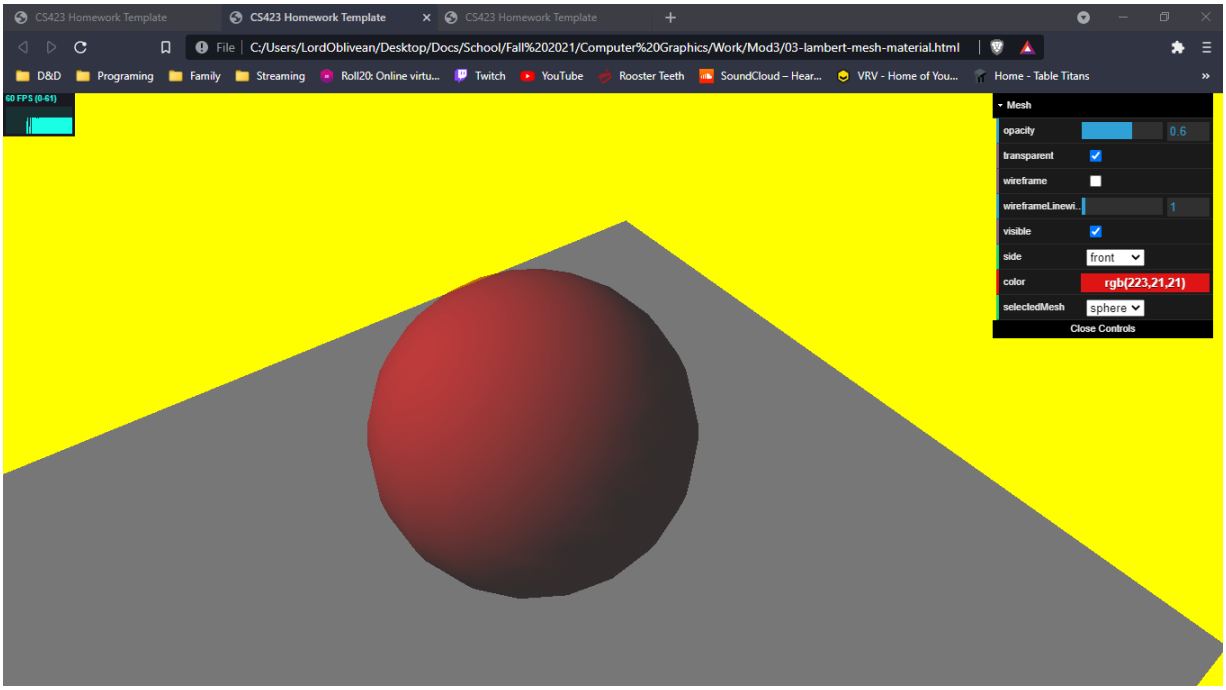
CS423

Basic

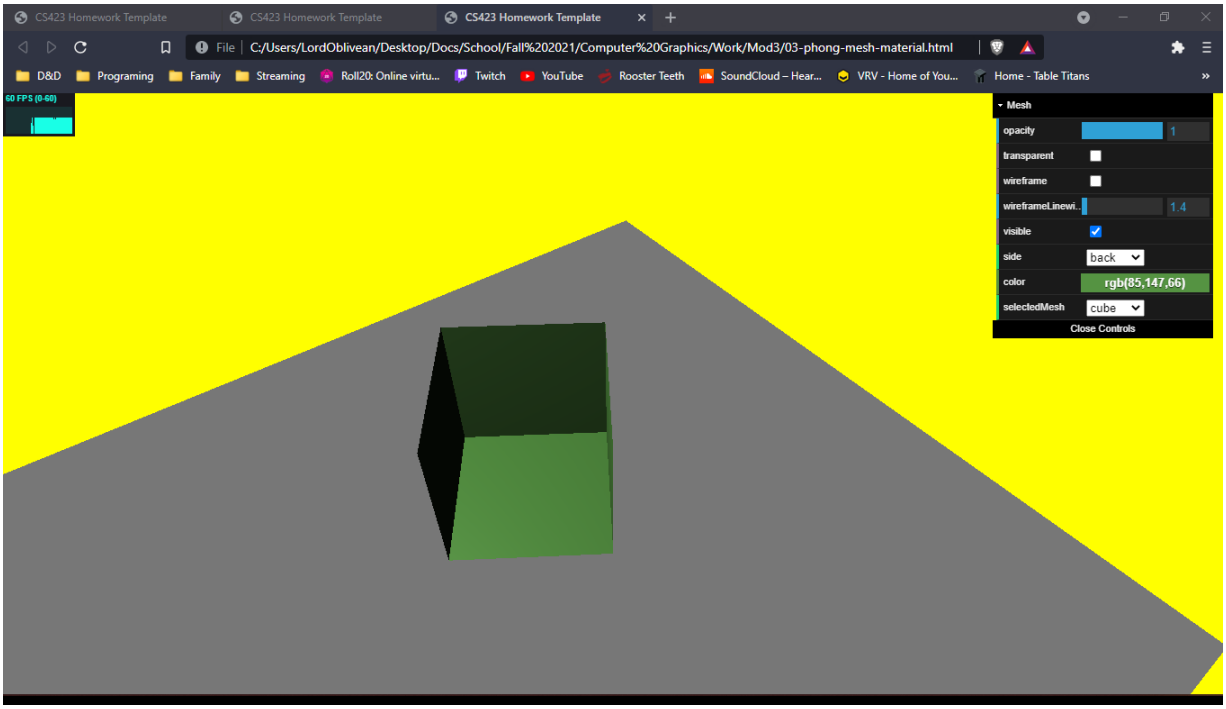




Lambert



Phong



Basic

```
<!DOCTYPE html>
<HTML>
        <HEAD>
         <TITLE>CS423 Homework Template</TITLE>
         <SCRIPT TYPE="text/javascript" SRC="../libs/three.js"></SCRIPT>
         <SCRIPT TYPE="text/javascript" SRC="../libs/stats.min.js"></SCRIPT>
         <SCRIPT TYPE="text/javascript" SRC="../libs/dat.gui.min.js"></SCRIPT>
         <STYLE>
          body {
          margin: 0;
          overflow: hidden;
          }
         </STYLE>
        </HEAD>
        <BODY>
         <DIV ID="Stats-output">
         </DIV>
         <DIV ID="WebGL-output">
         </DIV>
         <!-- Scripts that we use for running things -->
         <SCRIPT TYPE="text/javascript" SRC="03-basic-mesh-material.js"></SCRIPT>
        </BODY>
</HTML>


function init() {

   var stats = initStats();
```

```
// create a scene, that will hold all our elements such as objects, cameras and lights.
var scene = new THREE.Scene();

// create a camera, which defines where we're looking at.
var camera = new THREE.PerspectiveCamera(45, window.innerWidth / window.innerHeight, 0.1, 1000);

// create a render and set the size
var renderer = new THREE.WebGLRenderer();

renderer.setClearColor(new THREE.Color(0xEEEEEE, 1.0));
renderer.setSize(window.innerWidth, window.innerHeight);
renderer.shadowMapEnabled = true;

        var groundGeom = new THREE.PlaneGeometry(100, 100, 4, 4);
        var groundMesh = new THREE.Mesh(groundGeom, new THREE.MeshBasicMaterial({color: 0x777777}));
        groundMesh.rotation.x = -Math.PI / 2;
        groundMesh.position.y = -20;
        scene.add(groundMesh);

        var sphereGeometry = new THREE.SphereGeometry(14, 20 ,20);
        var cubeGeometry = new THREE.BoxGeometry(15, 15, 15);
        var planeGeometry = new THREE.PlaneGeometry(14, 14, 4, 4);

        var meshMaterial = new THREE.MeshBasicMaterial({color: 0x7777ff});

        var sphere = new THREE.Mesh(sphereGeometry, meshMaterial);
        var cube = new THREE.Mesh(cubeGeometry, meshMaterial);
```

```
        var plane = new THREE.Mesh(planeGeometry, meshMaterial);

        sphere.position.x = 0;
        sphere.position.y = 3;
        sphere.position.z = 2;

        cube.position = sphere.position;
        plane.position = sphere.position;

        scene.add(cube);

        camera.position.x = -20;
        camera.position.y = 50;
        camera. position.z = 40;
        camera.lookAt(new THREE.Vector3(10, 0, 0));

        var ambientLight = new THREE.AmbientLight(0x0c0c0c);
        scene.add(ambientLight);

        var spotLight = new THREE.SpotLight(0xffffff);
        spotLight.position.set(-40, 60, -10);
        spotLight.castShadow = true;
        scene.add(spotLight);

        // add the output of the renderer to the html element
document.getElementById("WebGL-output").appendChild(renderer.domElement);
```

```
// call the render function
var step = 0;
        var oldContext = null;

var controls = new function () {
   this.rotationSpeed = 0.02;
   this.bouncingSpeed = 0.03;

   this.opacity = meshMaterial.opacity;
                this.transparent = meshMaterial.transparent;
                this.visible = meshMaterial.visible;
                this.side = "front";

                this.color = meshMaterial.color.getStyle();
                this.wireframe = meshMaterial.wireframe;
                this.wireframeLinewidth = meshMaterial.wireframeLinewidth;
                this.wireframeLineJoin = meshMaterial.wireframeLinejoin;

                this.selectedMesh = "cube";

};

var gui = new dat.GUI();
```

```
var spGui = gui.addFolder("Mesh");
spGui.add(controls, 'opacity', 0, 1).onChange(function (e) {
   meshMaterial.opacity = e
});
spGui.add(controls, 'transparent').onChange(function (e) {
   meshMaterial.transparent = e
});
spGui.add(controls, 'wireframe').onChange(function (e) {
   meshMaterial.wireframe = e
});
spGui.add(controls, 'wireframeLinewidth', 0, 20).onChange(function (e) {
   meshMaterial.wireframeLinewidth = e
});
spGui.add(controls, 'visible').onChange(function (e) {
   meshMaterial.visible = e
});
spGui.add(controls, 'side', ["front", "back", "double"]).onChange(function (e) {

   switch (e) {
   case "front":
      meshMaterial.side = THREE.FrontSide;
      break;
   case "back":
      meshMaterial.side = THREE.BackSide;
      break;
   case "double":
      meshMaterial.side = THREE.DoubleSide;
      break;
   }
```

```
    meshMaterial.needsUpdate = true;
});
spGui.addColor(controls, 'color').onChange(function (e) {
    meshMaterial.color.setStyle(e)
});
spGui.add(controls, 'selectedMesh', ["cube", "sphere", "plane"]).onChange(function (e) {

    scene.remove(plane);
    scene.remove(cube);
    scene.remove(sphere);

    switch (e) {
    case "cube":
        scene.add(cube);
        break;
    case "sphere":
        scene.add(sphere);
        break;
    case "plane":
        scene.add(plane);
        break;

    }

    scene.add(e);
});



render();
```

```
    function render() {
        stats.update();

                        cube.rotation.y = step += 0.01;
                        plane.rotation.y = step;
                        sphere.rotation.y = step;

        // render using requestAnimationFrame
        requestAnimationFrame(render);
        renderer.render(scene, camera);
    }

    function initStats() {

        var stats = new Stats();

        stats.setMode(0); // 0: fps, 1: ms

        // Align top-left
        stats.domElement.style.position = 'absolute';
        stats.domElement.style.left = '0px';
        stats.domElement.style.top = '0px';

        document.getElementById("Stats-output").appendChild(stats.domElement);

        return stats;
    }
}
```

```
window.onload = init
```

Lambert

```
<!DOCTYPE html>
<HTML>
        <HEAD>
          <TITLE>CS423 Homework Template</TITLE>
          <SCRIPT TYPE="text/javascript" SRC="../libs/three.js"></SCRIPT>
          <SCRIPT TYPE="text/javascript" SRC="../libs/stats.min.js"></SCRIPT>
          <SCRIPT TYPE="text/javascript" SRC="../libs/dat.gui.min.js"></SCRIPT>
          <STYLE>
            body {
            margin: 0;
            overflow: hidden;
            }
          </STYLE>
        </HEAD>
        <BODY>
          <DIV ID="Stats-output">
          </DIV>
          <DIV ID="WebGL-output">
          </DIV>
          <!-- Scripts that we use for running things -->
          <SCRIPT TYPE="text/javascript" SRC="03-lambert-mesh-material.js"></SCRIPT>
        </BODY>
</HTML>

function init() {
```

```
var stats = initStats();

// create a scene, that will hold all our elements such as objects, cameras and lights.
var scene = new THREE.Scene();

// create a camera, which defines where we're looking at.
var camera = new THREE.PerspectiveCamera(45, window.innerWidth / window.innerHeight, 0.1, 1000);

// create a render and set the size
var renderer = new THREE.WebGLRenderer();

renderer.setClearColor(new THREE.Color(0xEEEEEE, 1.0));
renderer.setSize(window.innerWidth, window.innerHeight);
renderer.shadowMapEnabled = true;

        var groundGeom = new THREE.PlaneGeometry(100, 100, 4, 4);
        var groundMesh = new THREE.Mesh(groundGeom, new THREE.MeshBasicMaterial({color: 0x777777}));
        groundMesh.rotation.x = -Math.PI / 2;
        groundMesh.position.y = -20;
        scene.add(groundMesh);

        var sphereGeometry = new THREE.SphereGeometry(14, 20 ,20);
        var cubeGeometry = new THREE.BoxGeometry(15, 15, 15);
        var planeGeometry = new THREE.PlaneGeometry(14, 14, 4, 4);

        var meshMaterial = new THREE.MeshLambertMaterial({color: 0x7777ff});
```

```
        var sphere = new THREE.Mesh(sphereGeometry, meshMaterial);
        var cube = new THREE.Mesh(cubeGeometry, meshMaterial);
        var plane = new THREE.Mesh(planeGeometry, meshMaterial);

        sphere.position.x = 0;
        sphere.position.y = 3;
        sphere.position.z = 2;

        cube.position = sphere.position;
        plane.position = sphere.position;

        scene.add(cube);

        camera.position.x = -20;
        camera.position.y = 50;
        camera. position.z = 40;
        camera.lookAt(new THREE.Vector3(10, 0, 0));

        var ambientLight = new THREE.AmbientLight(0x0c0c0c);
        scene.add(ambientLight);

        var spotLight = new THREE.SpotLight(0xffffff);
        spotLight.position.set(-40, 60, -10);
        spotLight.castShadow = true;
        scene.add(spotLight);

        // add the output of the renderer to the html element
document.getElementById("WebGL-output").appendChild(renderer.domElement);
```

```
// call the render function
var step = 0;
        var oldContext = null;

var controls = new function () {
   this.rotationSpeed = 0.02;
   this.bouncingSpeed = 0.03;

   this.opacity = meshMaterial.opacity;
                this.transparent = meshMaterial.transparent;
                this.visible = meshMaterial.visible;
                this.side = "front";

                this.color = meshMaterial.color.getStyle();
                this.wireframe = meshMaterial.wireframe;
                this.wireframeLinewidth = meshMaterial.wireframeLinewidth;
                this.wireframeLineJoin = meshMaterial.wireframeLinejoin;

                this.selectedMesh = "cube";

};
```

```
var gui = new dat.GUI();



var spGui = gui.addFolder("Mesh");
spGui.add(controls, 'opacity', 0, 1).onChange(function (e) {
   meshMaterial.opacity = e
});
spGui.add(controls, 'transparent').onChange(function (e) {
   meshMaterial.transparent = e
});
spGui.add(controls, 'wireframe').onChange(function (e) {
   meshMaterial.wireframe = e
});
spGui.add(controls, 'wireframeLinewidth', 0, 20).onChange(function (e) {
   meshMaterial.wireframeLinewidth = e
});
spGui.add(controls, 'visible').onChange(function (e) {
   meshMaterial.visible = e
});
spGui.add(controls, 'side', ["front", "back", "double"]).onChange(function (e) {

   switch (e) {
   case "front":
      meshMaterial.side = THREE.FrontSide;
      break;
   case "back":
      meshMaterial.side = THREE.BackSide;
      break;
   case "double":
```

```
        meshMaterial.side = THREE.DoubleSide;
        break;
    }
    meshMaterial.needsUpdate = true;
});
spGui.addColor(controls, 'color').onChange(function (e) {
    meshMaterial.color.setStyle(e)
});
spGui.add(controls, 'selectedMesh', ["cube", "sphere", "plane"]).onChange(function (e) {

    scene.remove(plane);
    scene.remove(cube);
    scene.remove(sphere);

    switch (e) {
    case "cube":
        scene.add(cube);
        break;
    case "sphere":
        scene.add(sphere);
        break;
    case "plane":
        scene.add(plane);
        break;

    }

    scene.add(e);
});
```

```
render();

function render() {
   stats.update();

                cube.rotation.y = step += 0.01;
                plane.rotation.y = step;
                sphere.rotation.y = step;

   // render using requestAnimationFrame
   requestAnimationFrame(render);
   renderer.render(scene, camera);
}

function initStats() {

   var stats = new Stats();

   stats.setMode(0); // 0: fps, 1: ms

   // Align top-left
   stats.domElement.style.position = 'absolute';
   stats.domElement.style.left = '0px';
   stats.domElement.style.top = '0px';

   document.getElementById("Stats-output").appendChild(stats.domElement);
```

```
    return stats;
  }
}

window.onload = init
```

Phong

```
<!DOCTYPE html>
<HTML>
        <HEAD>
          <TITLE>CS423 Homework Template</TITLE>
          <SCRIPT TYPE="text/javascript" SRC="../libs/three.js"></SCRIPT>
          <SCRIPT TYPE="text/javascript" SRC="../libs/stats.min.js"></SCRIPT>
          <SCRIPT TYPE="text/javascript" SRC="../libs/dat.gui.min.js"></SCRIPT>
          <STYLE>
            body {
            margin: 0;
            overflow: hidden;
            }
          </STYLE>
        </HEAD>
        <BODY>
          <DIV ID="Stats-output">
          </DIV>
          <DIV ID="WebGL-output">
          </DIV>
          <!-- Scripts that we use for running things -->
          <SCRIPT TYPE="text/javascript" SRC="03-phong-mesh-material.js"></SCRIPT>
        </BODY>
```

```
</HTML>

function init() {

   var stats = initStats();

   // create a scene, that will hold all our elements such as objects, cameras and lights.
   var scene = new THREE.Scene();

   // create a camera, which defines where we're looking at.
   var camera = new THREE.PerspectiveCamera(45, window.innerWidth / window.innerHeight, 0.1,
1000);

   // create a render and set the size
   var renderer = new THREE.WebGLRenderer();

   renderer.setClearColor(new THREE.Color(0xEEEEEE, 1.0));
   renderer.setSize(window.innerWidth, window.innerHeight);
   renderer.shadowMapEnabled = true;

         var groundGeom = new THREE.PlaneGeometry(100, 100, 4, 4);
         var groundMesh = new THREE.Mesh(groundGeom, new THREE.MeshBasicMaterial({color:
0x777777}));
         groundMesh.rotation.x = -Math.PI / 2;
         groundMesh.position.y = -20;
         scene.add(groundMesh);

         var sphereGeometry = new THREE.SphereGeometry(14, 20 ,20);
         var cubeGeometry = new THREE.BoxGeometry(15, 15, 15);
```

```
var planeGeometry = new THREE.PlaneGeometry(14, 14, 4, 4);

var meshMaterial = new THREE.MeshPhongMaterial({color: 0x7777ff});

var sphere = new THREE.Mesh(sphereGeometry, meshMaterial);
var cube = new THREE.Mesh(cubeGeometry, meshMaterial);
var plane = new THREE.Mesh(planeGeometry, meshMaterial);

sphere.position.x = 0;
sphere.position.y = 3;
sphere.position.z = 2;

cube.position = sphere.position;
plane.position = sphere.position;

scene.add(cube);

camera.position.x = -20;
camera.position.y = 50;
camera. position.z = 40;
camera.lookAt(new THREE.Vector3(10, 0, 0));

var ambientLight = new THREE.AmbientLight(0x0c0c0c);
scene.add(ambientLight);

var spotLight = new THREE.SpotLight(0xffffff);
spotLight.position.set(-40, 60, -10);
spotLight.castShadow = true;
scene.add(spotLight);
```

```
        // add the output of the renderer to the html element
document.getElementById("WebGL-output").appendChild(renderer.domElement);









// call the render function
var step = 0;
        var oldContext = null;

var controls = new function () {
   this.rotationSpeed = 0.02;
   this.bouncingSpeed = 0.03;

   this.opacity = meshMaterial.opacity;
                this.transparent = meshMaterial.transparent;
                this.visible = meshMaterial.visible;
                this.side = "front";

                this.color = meshMaterial.color.getStyle();
                this.wireframe = meshMaterial.wireframe;
                this.wireframeLinewidth = meshMaterial.wireframeLinewidth;
                this.wireframeLineJoin = meshMaterial.wireframeLinejoin;

                this.selectedMesh = "cube";
```

```
};

var gui = new dat.GUI();



var spGui = gui.addFolder("Mesh");
spGui.add(controls, 'opacity', 0, 1).onChange(function (e) {
   meshMaterial.opacity = e
});
spGui.add(controls, 'transparent').onChange(function (e) {
   meshMaterial.transparent = e
});
spGui.add(controls, 'wireframe').onChange(function (e) {
   meshMaterial.wireframe = e
});
spGui.add(controls, 'wireframeLinewidth', 0, 20).onChange(function (e) {
   meshMaterial.wireframeLinewidth = e
});
spGui.add(controls, 'visible').onChange(function (e) {
   meshMaterial.visible = e
});
spGui.add(controls, 'side', ["front", "back", "double"]).onChange(function (e) {

   switch (e) {
   case "front":
      meshMaterial.side = THREE.FrontSide;
      break;
   case "back":
```

```
        meshMaterial.side = THREE.BackSide;
        break;
    case "double":
        meshMaterial.side = THREE.DoubleSide;
        break;
    }
    meshMaterial.needsUpdate = true;
});
spGui.addColor(controls, 'color').onChange(function (e) {
    meshMaterial.color.setStyle(e)
});
spGui.add(controls, 'selectedMesh', ["cube", "sphere", "plane"]).onChange(function (e) {

    scene.remove(plane);
    scene.remove(cube);
    scene.remove(sphere);

    switch (e) {
    case "cube":
        scene.add(cube);
        break;
    case "sphere":
        scene.add(sphere);
        break;
    case "plane":
        scene.add(plane);
        break;

    }
```

```
    scene.add(e);
});



render();

function render() {
    stats.update();

                cube.rotation.y = step += 0.01;
                plane.rotation.y = step;
                sphere.rotation.y = step;

    // render using requestAnimationFrame
    requestAnimationFrame(render);
    renderer.render(scene, camera);
}

function initStats() {

    var stats = new Stats();

    stats.setMode(0); // 0: fps, 1: ms

    // Align top-left
    stats.domElement.style.position = 'absolute';
    stats.domElement.style.left = '0px';
    stats.domElement.style.top = '0px';
```

```
        document.getElementById("Stats-output").appendChild(stats.domElement);


        return stats;
    }
}


window.onload = init
```