



Jayden Sipe Final Project Report

Explanation of Code and Functionality:

Website:

First off I built a website to accompany the game using JavaScript, HTML, and CSS. This website serves as a place to store the game, as well as give it some character. The planets are a part of the CSS background, except for the yellow one that is rendered in the game. The *gl.clearColor* is also set as transparent to allow the background to be seen. The JavaScript/HTML/CSS also takes care of any UI rendering that may need to be used, plays music and handles any game logic.

Rendering:

The first part of rendering we do is load the shaders for each of the models used in the game (rocket, planet, and asteroids). I did this with *twgl.createProgramInfo()*.

The shaders purpose was to draw/texture all the models, as well as make them receive light. I also implemented ambient and specular lighting.

Next, I loaded each model using Three.JS's OBJLoader and mapped each loaded model to use the format of (BELOW), to allow TWGL to process the model.

```
{  
    position,  
    normal,  
    texcoord  
}
```

I then create a buffer using this data for the GPU for each model, as well as creating a texture for each model.

For the asteroids I created a buffer every ~0.5 seconds or and stored them in an array. I will touch on this later.

I then created all the uniforms for the shader (specularFactor, lightColor, ambient, etc.) and position the models using the view projection. I then render every object using *twgl.drawBufferInfo* (and *twgl.setUniforms* and *twgl.setBuffersAndAttributes*).

The asteroids required an array to render so I would be able to instance multiple models. They then are animated with TWEEN.js to fly towards the camera, and are removed from the array once not visible by the camera.

TWEEN.js also controls the animation of the rocket moving up and down.

How to run code?

Simply open index.html.

User Input:

The goal of the game is to dodge the asteroids. There is an easy and hard mode that controls how frequently the asteroids are spawned.

Press “W” to go UP.

Press “S” to go DOWN.

OR

“Click” to go UP/DOWN.