**1)**

To get around this restriction I changed the texture settings. First, the S (horizontal--gl.texParameteri(gl.TEXTURE\_2D, gl.TEXTURE\_WRAP\_S, gl.CLAMP\_TO\_EDGE);) and T (vertical--gl.texParameteri(gl.TEXTURE\_2D, gl.TEXTURE\_WRAP\_T, gl.CLAMP\_TO\_EDGE);) axes' texture wrapping mode was set to gl.CLAMP\_TO\_EDGE. This parameter is important for textures that are not powers of two since it tells WebGL to stretch the texture's edge pixels to the boundaries of the form it is mapped onto, instead of trying to tile the texture.

**Change:**

A close-up of text

Description automatically generated

**Result:**

**A close up of a ball

Description automatically generated**

**2)**

this.endisablelight = gl.getUniformLocation(this.prog, 'enableLighting');

this.Positionofl = gl.getUniformLocation(this.prog, 'lightPos');

this.ambiance = gl.getUniformLocation(this.prog, 'ambient');

In this constructor part I locate lighting toggle uniform and light position uniform in shader program also I locate the ambient light intensity uniform in the shader program. Above code shows how I did this.

this.sa = gl.createBuffer();

gl.bindBuffer(gl.ARRAY\_BUFFER, this.sa);

gl.bufferData(gl.ARRAY\_BUFFER, new Float32Array(normalCoords), gl.STATIC\_DRAW);

Later, I created buffer and I initlizate it in setmesh part

gl.bindBuffer(gl.ARRAY\_BUFFER, this.sa);

gl.enableVertexAttribArray(this.normCoordLoc);

gl.vertexAttribPointer(this.normCoordLoc, 3, gl.FLOAT, false, 0, 0);

gl.uniform3f(this.Positionofl, lightX, lightY, 1.0);

Then here I bind normal buffer for vertex shader and enable attribute array for normal. Moreover, I set light position in the shader in the draw part.

Later I defined two function as enableLighting and setAmbientLight. In these functions I activate the shader program and in the enablelighting part I set lighting state 1 for enabled and 0 for disabled. Also In setAmbientLight part I updated this.ambiance with ambient light value. Lastly I updated meshFS part with setting dot calculation results to display color variables in order to change the light according to settings in toolbar.

**Not Enabled**

**A close up of a ball

Description automatically generatedA screen shot of a computer

Description automatically generated**

**Enabled(With Low light density)**

**A red and black ball with white lines

Description automatically generated**

**A screenshot of a computer

Description automatically generated**

**Enabled(With high light density)**

**A close up of a ball

Description automatically generated**

**A screenshot of a computer

Description automatically generated**