



‘Whitchurch Silk Mill’ Project Y2S2

Development/Programming
Process

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Contents

The Development Process.....	2
Experimentations	2
Introduction/Overview	2
The ‘CSS’ Code Utilised in the Experimentation Process	2
The Actual Experimentations	3
The Different Stages of the Development Process	10
The First Prototype of the Web Page(s)	10
The Second Prototype of the Web Page(s)	18
The Third Prototype of the Web Page(s)	27
The Fourth Prototype of the Web Page(s)	33
The Fifth Prototype of the Web Page(s)	61
The Sixth Prototype of the Web Page(s)	66
The Seventh Prototype of the Web Page(s)	71
The Eighth Prototype of the Web Page(s)	79
Other Issues/Problems with the Project	92
Final Stages of the Project	94
Unsolved Issues	97
Proof of Communication Via E-mails, Provided by the Client	98
Conclusion	98
Reference List/Bibliography/Acknowledgements for this Project for Year 2 Semester 2	99

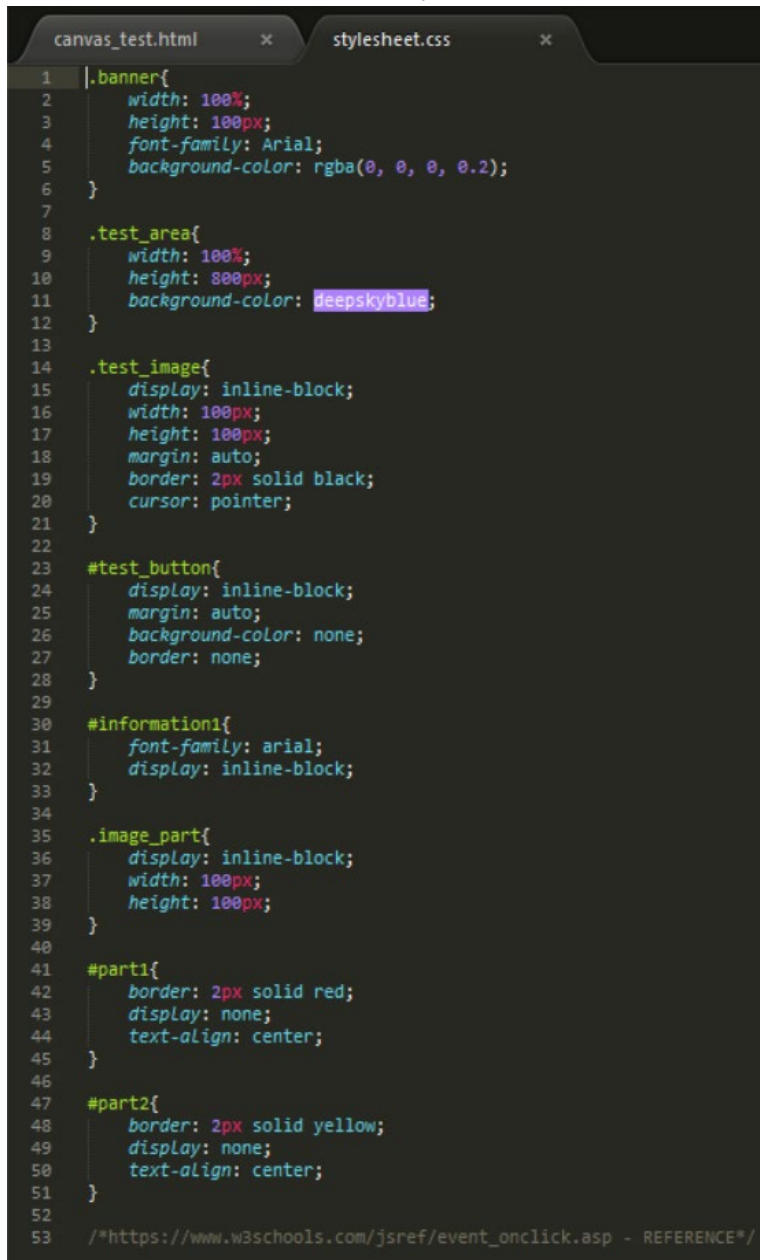
The Development Process

Experimentations

Introduction/Overview

To begin developing the web page for the 3D Loom brief, I first of all experimented with lots of different concepts. I utilised the following ‘CSS’ code for all of the following web pages in the experimentation process.

The ‘CSS’ Code Utilised in the Experimentation Process

A screenshot of a code editor with two tabs: 'canvas_test.html' and 'stylesheet.css'. The 'stylesheet.css' tab is active, showing CSS code with line numbers from 1 to 53. The code defines styles for a banner, test area, test image, test button, information1, image part, part1, and part2. The code is as follows:

```
1 .banner{
2   width: 100%;
3   height: 100px;
4   font-family: Arial;
5   background-color: rgba(0, 0, 0, 0.2);
6 }
7
8 .test_area{
9   width: 100%;
10  height: 800px;
11  background-color: deepskyblue;
12 }
13
14 .test_image{
15   display: inline-block;
16   width: 100px;
17   height: 100px;
18   margin: auto;
19   border: 2px solid black;
20   cursor: pointer;
21 }
22
23 #test_button{
24   display: inline-block;
25   margin: auto;
26   background-color: none;
27   border: none;
28 }
29
30 #information1{
31   font-family: arial;
32   display: inline-block;
33 }
34
35 .image_part{
36   display: inline-block;
37   width: 100px;
38   height: 100px;
39 }
40
41 #part1{
42   border: 2px solid red;
43   display: none;
44   text-align: center;
45 }
46
47 #part2{
48   border: 2px solid yellow;
49   display: none;
50   text-align: center;
51 }
52
53 /*https://www.w3schools.com/jsref/event_onclick.asp - REFERENCE*/
```

The Actual Experimentations

Buttons Experimentation

The First Attempt

Introduction/Overview

Firstly, I experimented with adding a button to an image so that when it was clicked it would have shown an image and information. This was a basic concept but it was to discover how to link different buttons to different parts of an image.

I first of all entered the couple of script tags displayed below through the help of 'W3Schools'. I tried to style the information so that it would have changed to 'This part is a... ..and it does this...' and so that the 'part 1' would have shown as I had it styled to 'display: none;' in the stylesheet.

I then added an event around the image I had on the page, however this didn't work.

The Code at this Stage

The Script Tags Utilised

```
<!DOCTYPE html>
<html>
<head>
  <title>Whitchurch Silk Mill Experimentation 1</title>
  <meta charset="utf-8">
  <link rel="stylesheet" href="stylesheet.css">
  <script>
    function textShow() {
      document.getElementById("information1").innerHTML = "This part is a... ..and it does this..."
    }
  </script>
  <script>
    function textBoxShow() {
      document.getElementById("part1").innerHTML = {display: block;}
    }
  </script>

```

Styling 'part 1' to Not Display Initially

```
#part1{
  border: 2px solid red;
  display: none;
  text-align: center;
}
```

Adding an Event Around the Image

```
40 </head>
41 <body>
42
43 <div class="banner">
44   <h1>Whitchurch Silk Mill Test 1</h1>
45   <p>This is an experimentation with buttons linking to different parts of an image</p>
46 </div>
47
48 <br><br><br>
49
50 <div class="test_area">
51   <button onclick="textShow()" id="test_button"><!--<button onclick="textBoxShow()" id="test_button">--></button>
52   <button onclick="textBoxShow2()" id="test_button"></button>
53 </div>
54 <div id="part1">
55   <p id="information1">Hello, this is a test. Does the text box appear?</p>
56   
57 </div>
58
59 <div id="part2">
60   <p id="information1">Hello, this is a test. Does the text box appear?</p>
61   
62 </div>
63 </div>
64
65 </body>
66 </html>

```


The Outcome on the Web Page (This Didn’t Work)

Whitchurch Silk Mill Test 1

This is an experimentation with buttons linking to different parts of an image



The Second Attempt

Introduction/Overview

Then I tried again, using 'W3Schools' to help myself.

I did try to attempt to add in a transition which would have faded the boxes in, however this didn't work. The code for this is highlighted below. This was from previous understanding from a previous course that seconds were measured in thousandths.

I then altered the code where I had integrated an event which then worked. When clicking on the images highlighted, the two boxes appeared with text and images.

The Code at this Stage

Utilising 'W3Schools' to Help and Attempting to Add a Transition

```
<!--w3schools REFERENCE - https://www.w3schools.com/howto/howto_js_toggle_hide_show.asp-->
<script>
function textboxShow() {
    var x = document.getElementById("part1");
    if (x.style.display === "none") {
        x.style.display = "block";
        x.style.transition = 5000;
    } else {
        x.style.display = "none";
    }
}
</script>
<script>
function textboxShow2() {
    var x = document.getElementById("part2");
    if (x.style.display === "none") {
        x.style.display = "block";
        x.style.transition = 5000;
    } else {
        x.style.display = "none";
    }
}
</script>
```

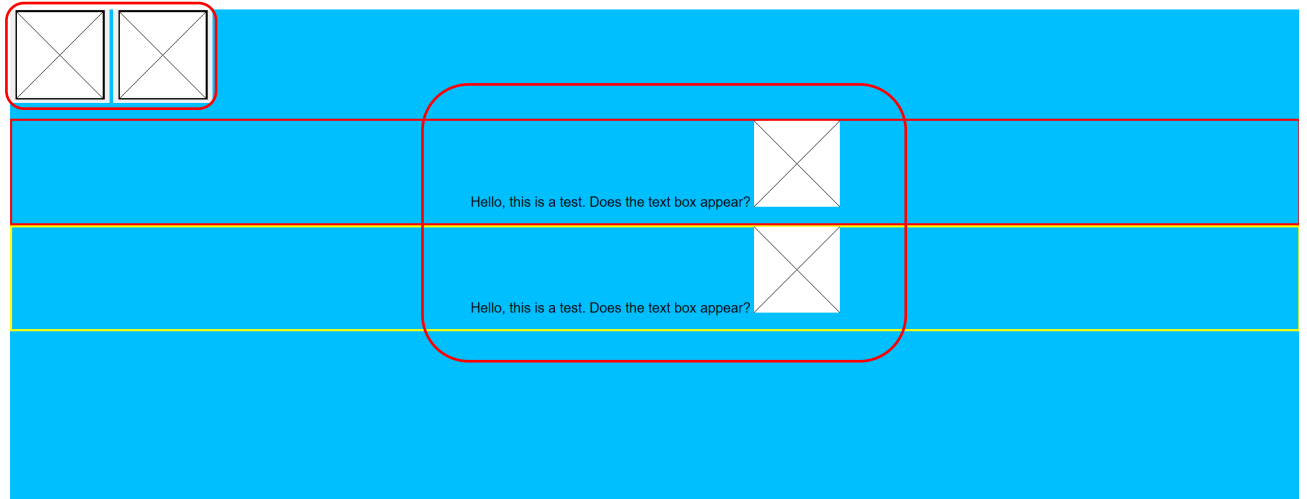
Altering the Code with the Event

```
<body>
<div class="banner">
    <h1>Whitchurch Silk Mill Test 1</h1>
    <p>This is an experimentation with buttons linking to different parts of an image</p>
</div>
<br><br><br>
<div class="test_area">
    <!--button onclick="textShow()" id="test_button"--><button onclick="textboxShow()" id="test_button"></button>
    <button onclick="textboxShow2()" id="test_button"></button>
</div>
<div id="part1">
    <p id="information1">Hello, this is a test. Does the text box appear?</p>
    
</div>
<div id="part2">
    <p id="information1">Hello, this is a test. Does the text box appear?</p>
    
</div>
</body>
</html>
```

The Outcome on the Web Page (This Worked)

Whitchurch Silk Mill Test 1

This is an experimentation with buttons linking to different parts of an image



‘HTML Canvas’ Experimentations

Introduction/Overview

As well as experimenting with the buttons as previously explained, I also experimented with ‘HTML Canvas’ elements. I simply researched into what types of outcomes could have been achieved and I found some code which produced an animated clock where I changed certain parts to experiment.

I did change some of the ‘stroke’ and ‘fill’ styles to analyse which parts of the outcome would have changed as will be seen on the outcome below.

The Code

The ‘HTML’ and ‘JavaScript’ Code

```
canvas_test.html x
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <title>Whitchurch Silk Mill Experimentation 2</title>
5 <meta charset="utf-8">
6 <link rel="stylesheet" href="stylesheet.css">
7 <!--REFERENCE CODE BELOW - https://developer.mozilla.org/en-US/docs/Web/API/Canvas_API/Tutorial/Basic_animations-->
8 <script>
9     function clock() {
10         var now = new Date();
11         var ctx = document.getElementById('canvas').getContext('2d');
12         ctx.save();
13         ctx.clearRect(0, 0, 150, 150);
14         ctx.translate(75, 75);
15         ctx.scale(0.4, 0.4);
16         ctx.rotate(-Math.PI / 2);
17         ctx.strokeStyle = 'pink';
18         ctx.fillStyle = 'white';
19         ctx.lineWidth = 8;
20         ctx.lineCap = 'round';
21
22         // Hour marks
23         ctx.save();
24         for (var i = 0; i < 12; i++) {
25             ctx.beginPath();
26             ctx.rotate(Math.PI / 6);
27             ctx.moveTo(100, 0);
28             ctx.lineTo(120, 0);
29             ctx.stroke();
30         }
31         ctx.restore();
32
33         // Minute marks
34         ctx.save();
35         ctx.lineWidth = 5;
36         for (i = 0; i < 60; i++) {
37             if (i % 5 != 0) {
38                 ctx.beginPath();
39                 ctx.moveTo(117, 0);
40                 ctx.lineTo(120, 0);
41                 ctx.stroke();
42             }
43             ctx.rotate(Math.PI / 30);
44         }
45         ctx.restore();
46
47         var sec = now.getSeconds();
48         var min = now.getMinutes();
49         var hr = now.getHours();
50         hr = hr >= 12 ? hr - 12 : hr;
51
52         ctx.fillStyle = 'black';
53
54         // write Hours
55         ctx.save();
56         ctx.rotate(hr * (Math.PI / 6) + (Math.PI / 360) * min + (Math.PI / 21600) * sec);
57         ctx.lineWidth = 14;
58         ctx.beginPath();
59         ctx.moveTo(-20, 0);
60         ctx.lineTo(80, 0);
61         ctx.stroke();
62         ctx.restore();
63
64         // write Minutes
65         ctx.save();
66         ctx.rotate((Math.PI / 30) * min + (Math.PI / 1800) * sec);
67         ctx.lineWidth = 10;
68         ctx.beginPath();
69         ctx.moveTo(-20, 0);
70         ctx.lineTo(112, 0);
71         ctx.stroke();
72         ctx.restore();
73     }
74 }
```

```
73
74 // Write seconds
75 ctx.save();
76 ctx.rotate(sec * Math.PI / 30);
77 ctx.strokeStyle = '#D40000';
78 ctx.fillStyle = '#D40000';
79 ctx.lineWidth = 6;
80 ctx.beginPath();
81 ctx.moveTo(-30, 0);
82 ctx.lineTo(83, 0);
83 ctx.stroke();
84 ctx.beginPath();
85 ctx.arc(0, 0, 10, 0, Math.PI * 2, true);
86 ctx.fill();
87 ctx.beginPath();
88 ctx.arc(95, 0, 10, 0, Math.PI * 2, true);
89 ctx.stroke();
90 ctx.fillStyle = 'rgba(0, 0, 0, 0)';
91 ctx.arc(0, 0, 3, 0, Math.PI * 2, true);
92 ctx.fill();
93 ctx.restore();
94
95 ctx.beginPath();
96 ctx.lineWidth = 14;
97 ctx.strokeStyle = '#325FA2';
98 ctx.arc(0, 0, 142, 0, Math.PI * 2, true);
99 ctx.stroke();
100
101 ctx.restore();
102
103 window.requestAnimationFrame(clock);
104 }
105
106 window.requestAnimationFrame(clock);12345678910111213141516171819202122232425262728293031323334353637383940414243444546474849505152535455565758596061626364656667686970717273747576
77787980818283848586878889909192939495969798
107 </script>
108 <body>
109 <div class="banner">
110 <h1>Whitchurch Silk Mill Test 2</h1>
111 <p>This is an experimentation with using HTML Canvas</p>
112 </div>
113
114 <div class="test_area">
115
116 <canvas id="canvas" width="150" height="150"></canvas>
117
118 </div>
119
120 </body>
121 </html>
```

The Outcome on the Web Page

Introduction/Overview

As can be seen below, the clock was impressive when knowing that this could have been achieved through coding. This helped enhance my knowledge of a possible technique for the 3D loom project I was undertaking although this was a 2D object rather than a 3D object.

The Actual Outcome

Whitchurch Silk Mill Test 2

This is an experimentation with using HTML Canvas



'WebGL' Experimentations

Introduction/Overview

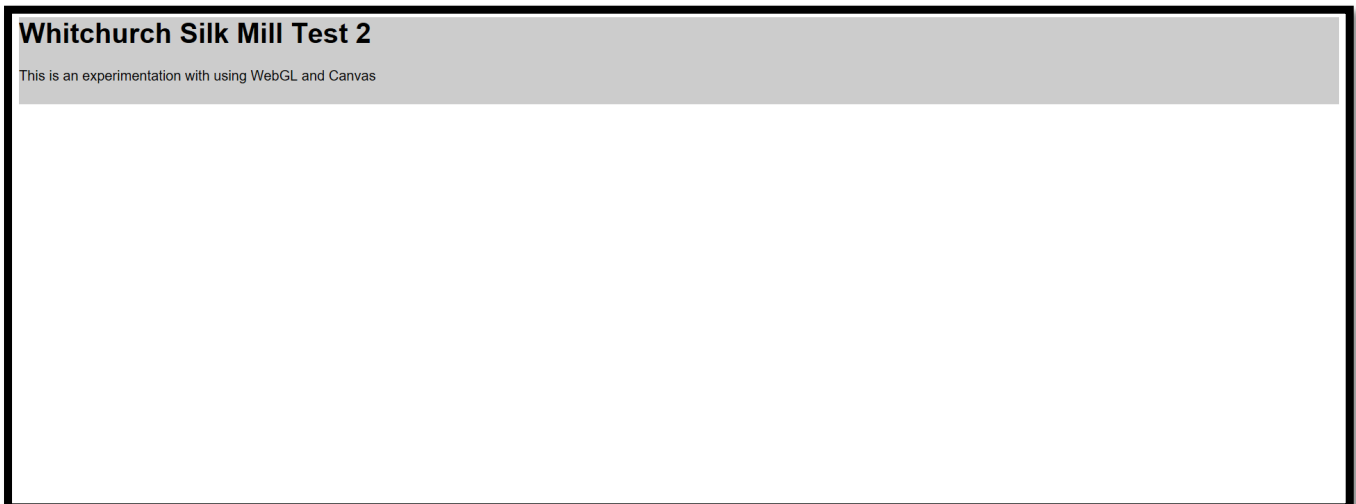
I also experimented with 'WebGL' to understand how this worked through again finding some code on the Internet and integrating it into a 'HTML' document.

As will be evident below, the code that I found through research didn't work and as I was new to the concept of 'WebGL', this may have been why. During the time I thought that it didn't work because of the website browsers I was utilising. However, from reflection it may have been because I needed to include other code to make it function properly. The code was copied from 'Mozilla's' website.

The Integrated Code into a 'HTML' Document

```
webgl_test.html x
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <title>Whitchurch Silk Mill Experimentation 3</title>
5 <meta charset="utf-8">
6 <link rel="stylesheet" href="stylesheet.css">
7 <!--REFERENCE CODE BELOW (This doesn't work in my browsers) - https://developer.mozilla.org/en-US/docs/Web/API/WebGL_API/Tutorial/Getting_started_with_WebGL-->
8 <script>
9     main();
10
11     //
12     // start here
13     //
14     function main() {
15         const canvas = document.querySelector("#glCanvas");
16         // Initialize the GL context
17         const gl = canvas.getContext("webgl");
18
19         // Only continue if WebGL is available and working
20         if (!gl) {
21             alert("Unable to initialize WebGL. Your browser or machine may not support it.");
22             return;
23         }
24
25         // Set clear color to black, fully opaque
26         gl.clearColor(0.0, 0.0, 0.0, 1.0);
27         // Clear the color buffer with specified clear color
28         gl.clear(gl.COLOR_BUFFER_BIT);
29         }123456789101112131415161718192021
30 </script>
31 <body>
32 <div class="banner">
33 <h1>Whitchurch Silk Mill Test 2</h1>
34 <p>This is an experimentation with using WebGL and Canvas</p>
35 </div>
36
37 <canvas id="glCanvas" width="640" height="480"></canvas>
38
39 </body>
40 </html>
```

The Outcome on the Web Page (This Didn't Work)



The Different Stages of the Development Process

The First Prototype of the Web Page(s)

Initial Stages of this Prototype

Introduction/Overview

After experimenting with different concepts, I then began to make a prototype of the web page for the interactive 3D loom project. I created a web page called '3d_loom_pg.html', linking it to a separate stylesheet called 'stylesheet.css'. This is highlighted below.

As will be evident, I started to implement the basic elements such as the title, banner and main content areas to allow for prototyping to begin.

With regards to the 'CSS' code, I added in a responsive grid from 'W3Schools' and added some styling for the elements in the 'HTML'. Some of this was copied from the 'Cherry Childcare' project I had been undertaking as well.

The Code at this Stage

The 'HTML' Code



```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <title>3D Loom Page</title>
5   <link rel="stylesheet" href="stylesheet.css">
6 </head>
7
8 <body>
9   <div class="banner">
10     <h1>Welcome to the 3D Loom Page</h1>
11     <p>On this page, you will be able to interact and view different parts of a loom in 3D.</p>
12   </div>
13
14   <div class="row">
15     <div class="col-6">
16       <div class="main_content">
17         <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.</p> <!-- https://www.lipsum.com/feed/html - REFERENCE THIS-->
18       </div>
19     </div>
20     <div class="col-6">
21       <div class="main_content2">
22         <button id="test_button"></button>
23       </div>
24     </div>
25   </div>
26 </body>
27
28 </html>
```

The 'CSS' Code

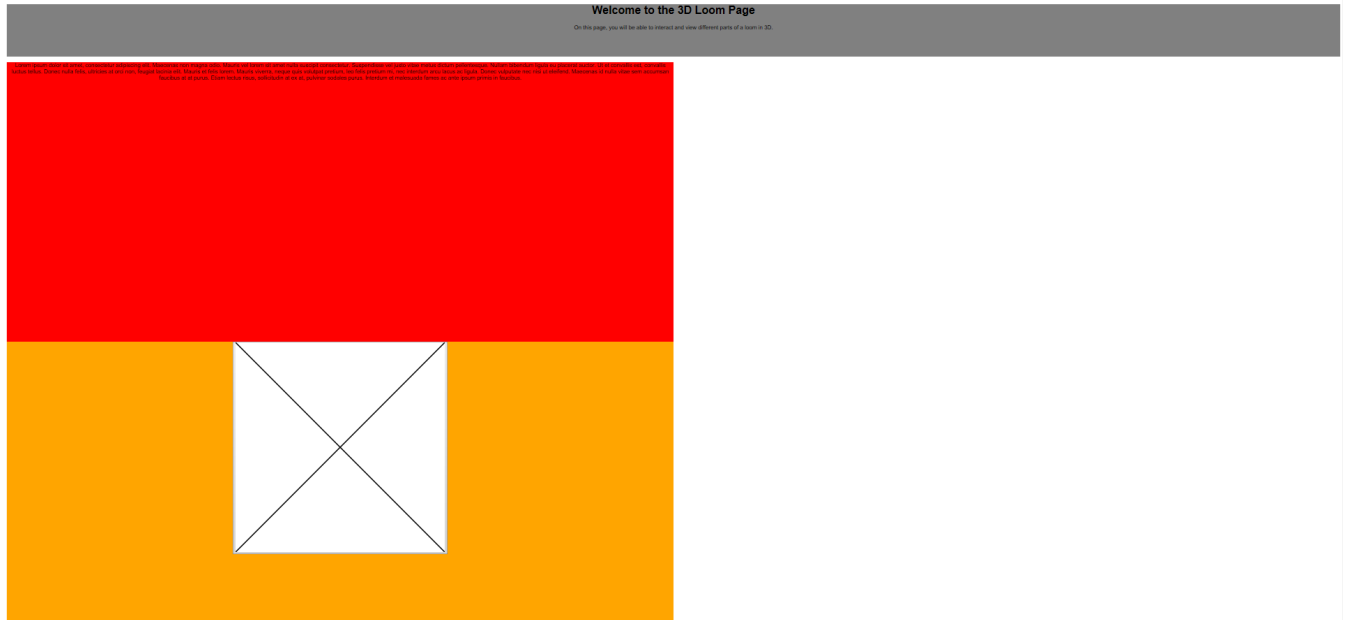
The Integrated Responsive Grid from 'W3Schools'

```
3d_loom_pg.html x buttons_test.html x stylesheet.css — Experimentations with Code x careers_pg.html x stylesheet.css — Skeletons or Prototypes\Prototype 1 x
1 h1{
2   font-family: Arial;
3 }
4
5 p{
6   font-family: Arial;
7 }
8
9 /*w3schools - REFERENCE DONE*/ /*These are the columns which are used for responsive design*/
10 /*FOR MOBILE SCREENS*/
11 [class="col-"] {
12   width: 100%;
13 }
14
15 @media only screen and (min-width: 600px) {
16   /*FOR TABLETS*/
17   .col-m-1 {width: 8.33%;}
18   .col-m-2 {width: 16.66%;}
19   .col-m-3 {width: 25%;}
20   .col-m-4 {width: 33.33%;}
21   .col-m-5 {width: 41.66%;}
22   .col-m-6 {width: 50%;}
23   .col-m-7 {width: 58.33%;}
24   .col-m-8 {width: 66.66%;}
25   .col-m-9 {width: 75%;}
26   .col-m-10 {width: 83.33%;}
27   .col-m-11 {width: 91.66%;}
28   .col-m-12 {width: 100%;} /*w3schools - REFERENCE*/
29 }
30
31 @media only screen and (min-width: 768px) { /*THIS IS WHAT YOU NEED TO REFER TO FOR PUTTING IN THE HTML*/
32   /*FOR DESKTOPS*/
33   .col-1 {width: 8.33%;}
34   .col-2 {width: 16.66%;}
35   .col-24 {width: 20%;}
36   .col-3 {width: 25%;}
37   .col-4 {width: 33.33%;}
38   .col-5 {width: 41.66%;}
39   .col-6 {width: 50%;}
40   .col-7 {width: 58.33%;}
41   .col-8 {width: 66.66%;}
42   .col-9 {width: 75%;}
43   .col-10 {width: 83.33%;}
44   .col-11 {width: 91.66%;}
45   .col-12 {width: 100%;} /*w3schools REFERENCE - https://www.w3schools.com/css/css_rwd_grid.asp*/
46 }
47 }
```

Adding Some Styling for the Elements in the 'HTML' Code

```
3d_loom_pg.html x buttons_test.html x stylesheet.css — Experimentations with Code x careers_pg.html x stylesheet.css — Skeletons or Prototypes\Prototype 1 x
49 .banner{
50   width: 100%;
51   height: 150px;
52   background-color: grey;
53   text-align: center;
54 }
55
56 .main_content{
57   width: 100%;
58   height: 800px;
59   background-color: red;
60   text-align: center;
61 }
62
63 .main_content2{
64   width: 100%;
65   height: 800px;
66   background-color: orange;
67   text-align: center;
68 }
69
70 .image_part{
71   display: inline-block;
72   width: 100px;
73   height: 100px;
74 }
```


The Outcome on the Web Page



The Experienced Issues

Introduction/Overview

As will have been evident above, I did have an issue where the image and its container would have appeared underneath the text and its container above. To solve this, I tried changing each 'div' to 'inline' but this made them disappear. I then tried 'inline-block' but this reverted the elements back to what was evident above.

Other Attempted Solutions

Attempt 1

Introduction/Overview

I continued to try and fix the problem, adding in some extra code into the 'Stylesheet' shown below. However, this didn't solve the problem either.

The Additional Integrated 'CSS' Code

```
9
10 .row::after { /*w3schools - REFERENCE*/
11     content: "";
12     clear: both;
13     display: table;
14 }
15
16 [class*="col-"] {
17     float: left;
18     padding: 15px;
19     /*border: 1px solid red; /*w3schools - REFERENCE*/
20 }
21
```

Attempt 2

Introduction/Overview

I then tried adding in a couple of 'meta' tags with one being for the viewport but again, this didn't solve the problem either.

The Added 'Meta' Tags into the 'HTML' File

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>3D Loom Page</title>
  <meta charset="utf-8">
  <link rel="stylesheet" href="stylesheet.css">
  <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
</head>
```

Attempt 3

Introduction/Overview

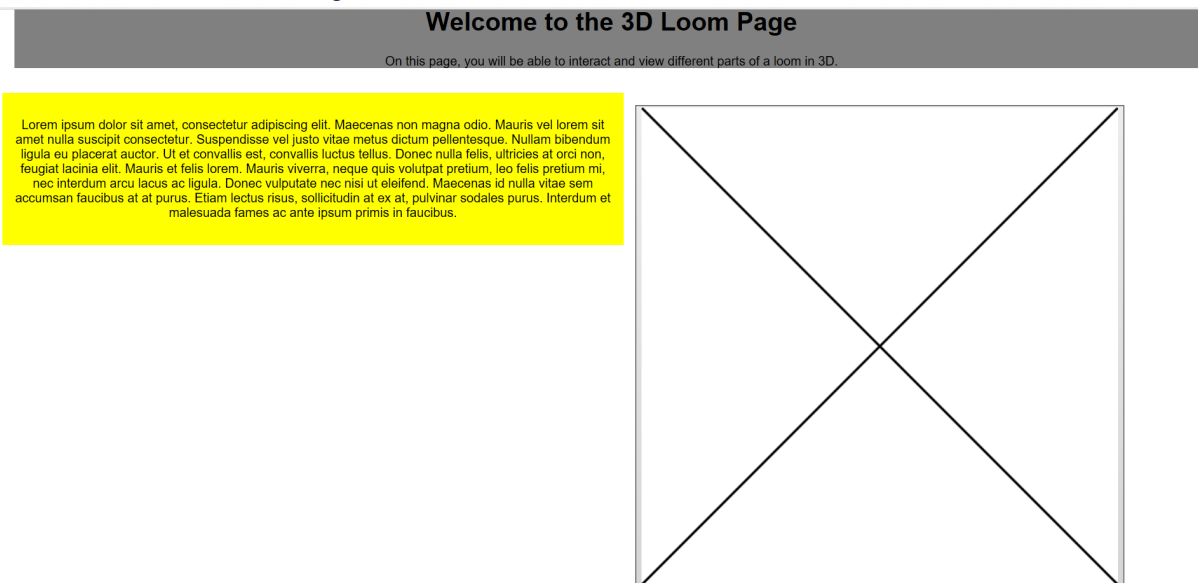
After altering the column size of where the image was placed to 'col-3', this solved the issue of pushing the column onto a separate line.

However, this wasn't correct as the quantity of columns that were required in a row must have equalled twelve, of which this now didn't. Therefore, I had to continue to solve the issue.

Changing the 'Class' to 'col-3'

```
<div class="row">
  <div class="main content">
    <div class="col-6">
      <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.</p> <!--https://www.lipsum.com/feed/html - REFERENCE THIS-->
    </div>
    <div class="col-3">
      <button id="test_button"></button> <!--https://www.w3schools.com/tags/att_img_alt.asp-->
    </div>
  </div>
</div>
```

The Outcome on the Web Page



The Final Attempt

Introduction/Overview

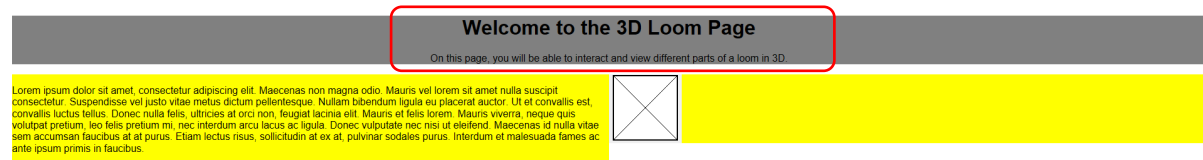
After attempting many different possible solutions, I soon realised that when removing the 'padding' from the '[class*="col-"]' in the 'CSS' code, this meant that both columns could have fitted onto the same line. This was because the 'padding' was adding extra space to the columns which meant that one would have been forced onto the line below.

This also resolved an issue which allowed for horizontal scrolling because there was too much space around the banner which contained the welcome message with the description. However, as can be seen below, the elements then looked quite close together but this was something to consider further on in the project.

Removing the 'padding' in the 'CSS' File

```
15  
16 [class*="col-"] {  
17     float: left;  
18     /*padding: 15px;*/  
19     /*border: 1px solid red; /*w3schools - REFERENCE*/  
20 }
```

The Outcome on the Web Page (This Resolved the Issue)



Structuring the Web Page

Introduction/Overview

After starting with the project, I then continued to structure and style the web page by changing the 'HTML' and 'CSS' code.

The main aspect added to the 'HTML' file was different buttons which I thought could have been used to create 'onclick' events for the different parts of the 3D loom to appear with their separate pieces of information.

The Code at this Stage

The 'HTML' Code

```
3d_loom_pg.html x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4 <title>3D Loom Page</title>
5 <meta charset="utf-8">
6 <link rel="stylesheet" href="stylesheet.css">
7 <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8 </head>
9
10 <body>
11 <div class="row">
12 <div class="col-12">
13 <div class="banner">
14 <h1>Welcome to the 3D Loom Page</h1>
15 <p>On this page, you will be able to interact and view different parts of a loom in 3D.</p>
16 </div>
17 </div>
18 </div>
19
20 <div class="row">
21 <div class="col-6">
22 <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante isum oris in faucibus.</p> <!--https://www.looom.com/feed.html - Whitchurch Note-->
23 <button id="part1">Part 1</button>
24 <button id="part2">Part 2</button>
25 <button id="part3">Part 3</button>
26 <button id="part4">Part 4</button>
27 <button id="part5">Part 5</button>
28 <button id="part6">Part 6</button>
29 <button id="part7">Part 7</button>
30 <button id="part8">Part 8</button>
31 <button id="part9">Part 9</button>
32 <button id="part10">Part 10</button>
33 <button id="part11">Part 11</button>
34 <button id="part12">Part 12</button>
35 <button id="part13">Part 13</button>
36 <button id="part14">Part 14</button>
37 </div>
38 <div class="col-6">
39 <button id="test_button">Test Button</button>
40 </div>
41 </div>
42
43 </body>
44
45 </html>
```

The 'CSS' Code

```
3d_loom_pg.html x stylesheet.css x
1 h1{
2 font-family: Arial;
3 }
4
5 p{
6 font-family: Arial;
7 }
8
9
10 .row:after { /*w3schools - REFERENCE*/
11 content: "";
12 clear: both;
13 display: table;
14 }
15
16 [class="col-"] {
17 float: left;
18 /*padding: 15px;
19 /*border: 1px solid red; /*w3schools - REFERENCE*/
20 }
21
22 /*w3schools - REFERENCE DONE*/ /*These are the columns which are used for responsive design*/
23 /*FOR MOBILE SCREENS*/
24 [class="col-"] {
25 width: 100%;
26 }
27
28 @media only screen and (min-width: 600px) {
29 /*FOR TABLETS*/
30 .col-m-1 {width: 8.33%;}
31 .col-m-2 {width: 16.66%;}
32 .col-m-3 {width: 25%;}
33 .col-m-4 {width: 33.33%;}
34 .col-m-5 {width: 41.66%;}
35 .col-m-6 {width: 50%;}
36 .col-m-7 {width: 58.33%;}
37 .col-m-8 {width: 66.66%;}
38 .col-m-9 {width: 75%;}
39 .col-m-10 {width: 83.33%;}
40 .col-m-11 {width: 91.66%;}
41 .col-m-12 {width: 100%;} /*w3schools - REFERENCE*/
42 }
43
```

```
3d_loom_pg.html x stylesheet.css x
43
44 @media only screen and (min-width: 768px) { /*THIS IS WHAT YOU NEED TO REFER TO FOR PUTTING IN THE HTML*/
45     /*FOR DESKTOPS*/
46     .col-1 {width: 8.33%;}
47     .col-2 {width: 16.66%;}
48     .col-24 {width: 20%;}
49     .col-3 {width: 25%;}
50     .col-4 {width: 33.33%;}
51     .col-5 {width: 41.66%;}
52     .col-6 {width: 50%; background-color: yellow;}
53     .col-7 {width: 58.33%;}
54     .col-8 {width: 66.66%;}
55     .col-9 {width: 75%;}
56     .col-10 {width: 83.33%;}
57     .col-11 {width: 91.66%;}
58     .col-12 {width: 100%;} /*w3schools REFERENCE - https://www.w3schools.com/css/css_rwd_grid.asp*/
59 }
60
61
62 .banner{
63     background-color: grey;
64     text-align: center;
65     width: 100%;
66     height: auto;
67 }
68
69 .main_content{
70     background-color: red;
71     text-align: center;
72 }
73
74 .main_content2{
75     background-color: orange;
76     text-align: center;
77 }
78
79 .test_image{
80     display: block;
81     width: 100%;
82     height: auto;
83     margin: auto;
84     border: 2px solid black;
85     cursor: pointer;
86 }
87
```

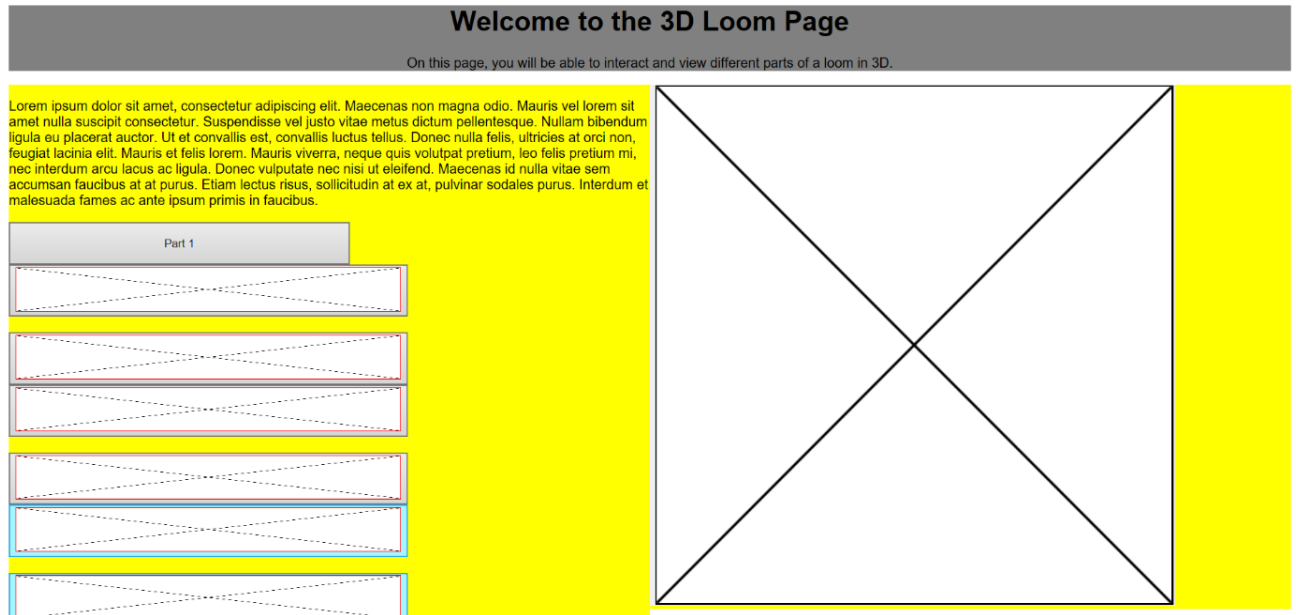
```
3d_loom_pg.html x stylesheet.css x
87
88 #test_button{
89     display: inline-block;
90     margin: auto;
91     background-color: none;
92     border: none;
93 }
94
95 .buttons {
96     width: 450px;
97     height: 50px;
98     cursor: pointer;
99     border: 1px solid red;
100 }
101
102 #part1{
103     width: 400px;
104     height: 50px;
105     cursor: pointer;
106 }
```

The Final Outcome on the Web Page for Prototype 1

Introduction/Overview

As can be seen below, the web page wasn’t perfect but the whole purpose was to produce a simple structure which could have then been improved in the following prototypes.

The Actual Outcome



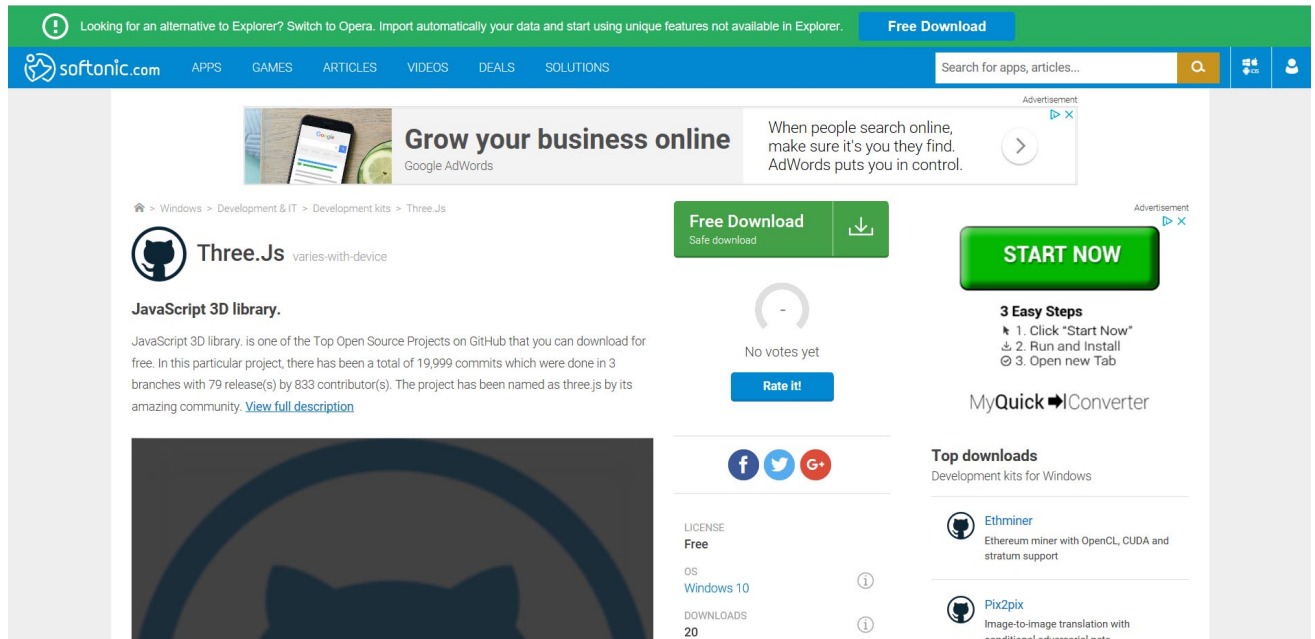
The Second Prototype of the Web Page(s)

Undertaking Research Regarding Technologies to Utilise

Introduction/Overview

After making the first prototype as a starting point, I then began to research more into what could have been used to show 3D models on web pages. I soon realised that utilising ‘three.js’ would have been beneficial and I downloaded the files for this from the following website (all files are referenced at the end of this section/document).

The Website from Where ‘three.js’ was Downloaded



Experimenting with 'three.js'

Introduction/Overview

I then experimented by using some code provided by the 'threejs.org' website. This produced an animating green cube on a 'HTML' page.

This allowed myself to broaden my knowledge, although the green cube below was created within the code whereas the requirement was to implement a 3D object onto the web page. This was something which was explored further on in the project. However, for this stage it was beneficial to understand the medium in which objects could have been placed onto a web page.

The Code Utilised to Experiment

```
three.js / docs
Type to filter x

Manual
Getting Started
  Creating a scene
  Import via modules
  Browser support
  WebGL compatibility check
  How to run things locally
  Drawing Lines
  Creating Text
  Migration Guide
  Code Style Guide
  FAQ
  Useful links
Next Steps
  How to update things
  Matrix transformations
  Animation System
Build Tools
Testing with NPM
Reference
  Animation
  ...

<html>
  <head>
    <title>My first three.js app</title>
    <style>
      body { margin: 0; }
      canvas { width: 100%; height: 100%; }
    </style>
  </head>
  <body>
    <script src="js/three.js"></script>
    <script>
      var scene = new THREE.Scene();
      var camera = new THREE.PerspectiveCamera( 75, window.innerWidth/window.innerHeight, 0.1, 1000 );

      var renderer = new THREE.WebGLRenderer();
      renderer.setSize( window.innerWidth, window.innerHeight );
      document.body.appendChild( renderer.domElement );

      var geometry = new THREE.BoxGeometry( 1, 1, 1 );
      var material = new THREE.MeshBasicMaterial( { color: 0x00ff00 } );
      var cube = new THREE.Mesh( geometry, material );
      scene.add( cube );

      camera.position.z = 5;

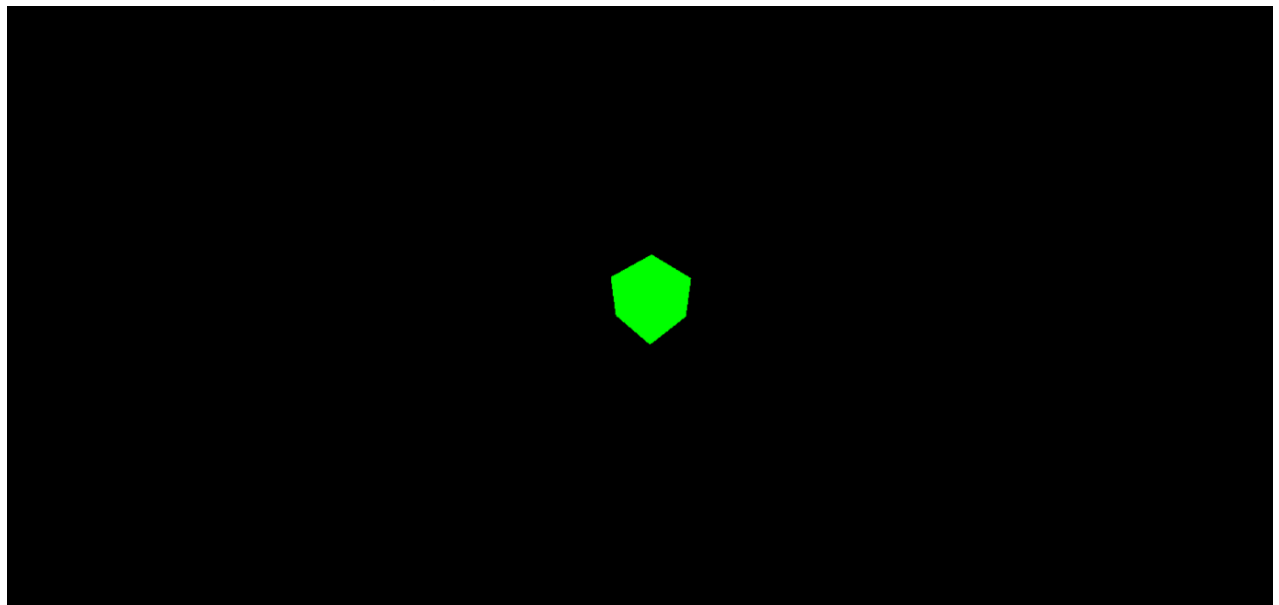
      var animate = function () {
        requestAnimationFrame( animate );

        cube.rotation.x += 0.1;
        cube.rotation.y += 0.1;

        renderer.render(scene, camera);
      };

      animate();
    </script>
  </body>
</html>
```

The Outcome of this on the Web Page



Developing the Prototype Further

The Main 3D Loom Page

Introduction/Overview

I then continued to develop the prototype by adding in more 'HTML' and 'CSS' code. As will be evident below, I changed the buttons to links and included different parts of the loom as each of these links from research via the Internet. The placeholder on the right-hand side of the outcome would have been where the interactive 3D model would have been placed.

The links to the left on the outcome were each coded to navigate to separate pages so that the user could have viewed the different parts separately and have been able to have interacted with them. The idea was changed from navigating to specific parts of the loom on the same page to this as I believed it to be easier to implement.

The Code at this Stage

The 'HTML' and 'JavaScript' Code

```
3d_loom_pg.html x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4 <title>3D Loom Page</title>
5 <meta charset="utf-8">
6 <link rel="stylesheet" href="stylesheet.css">
7 <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8 </head>
9
10 <body>
11
12 <div class="row">
13 <div class="col-12">
14 <div class="banner">
15 <h1>Welcome to the 3D Loom Page</h1>
16 <p>On this page, you will be able to interact and view different parts of a loom in 3D.</p>
17 </div>
18 </div>
19 </div>
20
21 <div class="row">
22 <div class="col-6">
23 <div class="instructions_section">
24 <h2>Instructions of how to Operate this Pages</h2>
25 <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin in ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.</p> <!--https://www.lipsum.com/feed/html - REFERENCE THIS-->
26
27 <a href="part1.html" target="_blank"><p>Warp Beam</p></a>
28 <a href="part2.html" target="_blank"><p>Shaft/Harness</p></a>
29 <a href="part3.html" target="_blank"><p>Heddles</p></a>
30 <a href="part4.html" target="_blank"><p>Shuttle</p></a>
31 <a href="part5.html" target="_blank"><p>Reed</p></a>
32 <a href="part6.html" target="_blank"><p>Take up roll</p></a> <!--Information for Prototyping - https://www.linkedin.com/pulse/20141030195455-49457671-understanding-weaving-what-are
33 </div> <!--Issue where I forgot to add div that meant the image was pushed onto another row - thought it was because I had added text center and div in-->
34 </div>
35 <div class="col-6">
36  <!--https://www.w3schools.com/tags/att_img_alt.asp-->
37 <script src="js/three.js"></script>
38 <script>
39 var scene = new THREE.Scene();
40 var camera = new THREE.PerspectiveCamera( 20, window.innerWidth/window.innerHeight, 1, 1000 );
41
42 var renderer = new THREE.WebGLRenderer();
43 renderer.setSize( window.innerWidth, window.innerHeight );
44 document.body.appendChild( renderer.domElement );
45
46 var geometry = new THREE.BoxGeometry( 1, 1, 1 );
47 var material = new THREE.MeshBasicMaterial( { color: 0x00ff00 } );
48 var cube = new THREE.Mesh( geometry, material );
49 scene.add( cube );
50
51 camera.position.z = 5;
52
53 var animate = function () {
54 requestAnimationFrame( animate );
55
56 cube.rotation.x += 0.01;
57 cube.rotation.y += 0.01;
58
59 renderer.render(scene, camera);
60
61 };
62
63 animate();
64 </script>
65 </div>
66
67 </body>
68
69 </html>
70
71 </html>
```

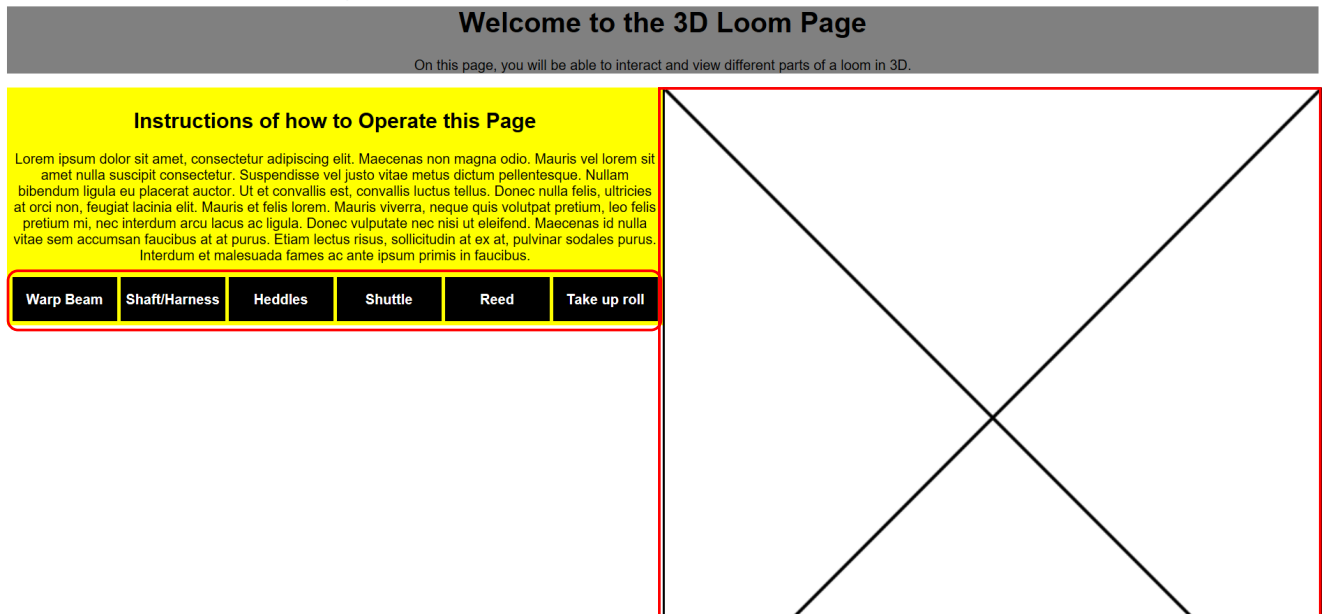
The 'CSS' Code

```
3d_loom_pg.html x stylesheet.css x
1 h1{
2   font-family: Arial;
3 }
4
5 h2{
6   font-family: Arial;
7 }
8
9 p{
10  font-family: Arial;
11 }
12
13
14 .row::after { /*w3schools - REFERENCE*/
15   content: "";
16   clear: both;
17   display: table;
18 }
19
20 [class*="col-"] {
21   float: left;
22   /*padding: 15px;
23   /*border: 1px solid red; /*w3schools - REFERENCE*/
24 }
25
26 /*w3schools - REFERENCE DONE*/ /*These are the columns which are used for responsive design*/
27 /*FOR MOBILE SCREENS*/
28 [class*="col-"] {
29   width: 100%;
30 }
31
32 @media only screen and (min-width: 600px) {
33   /*FOR TABLETS*/
34   .col-m-1 {width: 8.33%;}
35   .col-m-2 {width: 16.66%;}
36   .col-m-3 {width: 25%;}
37   .col-m-4 {width: 33.33%;}
38   .col-m-5 {width: 41.66%;}
39   .col-m-6 {width: 50%;}
40   .col-m-7 {width: 58.33%;}
41   .col-m-8 {width: 66.66%;}
42   .col-m-9 {width: 75%;}
43   .col-m-10 {width: 83.33%;}
44   .col-m-11 {width: 91.66%;}
45   .col-m-12 {width: 100%;} /*w3schools - REFERENCE*/
46 }
47
```

```
3d_loom_pg.html x stylesheet.css x
47
48 @media only screen and (min-width: 768px) { /*THIS IS WHAT YOU NEED TO REFER TO FOR PUTTING IN THE HTML*/
49   /*FOR DESKTOPS*/
50   .col-1 {width: 8.33%;}
51   .col-2 {width: 16.66%;}
52   .col-24 {width: 20%;}
53   .col-3 {width: 25%;}
54   .col-4 {width: 33.33%;}
55   .col-5 {width: 41.66%;}
56   .col-6 {width: 50%; background-color: yellow;}
57   .col-7 {width: 58.33%;}
58   .col-8 {width: 66.66%;}
59   .col-9 {width: 75%;}
60   .col-10 {width: 83.33%;}
61   .col-11 {width: 91.66%;}
62   .col-12 {width: 100%;} /*w3schools REFERENCE - https://www.w3schools.com/css/css_rwd_grid.asp*/
63 }
64
65
66 .banner{
67   background-color: grey;
68   text-align: center;
69   width: 100%;
70   height: auto;
71 }
72
73 .main_content{
74   background-color: red;
75   text-align: center;
76 }
77
78 .main_content2{
79   background-color: orange;
80   text-align: center;
81 }
82
83 .test_image{
84   display: block;
85   width: 100%;
86   height: auto;
87   margin: auto;
88   border: 2px solid black;
89 }
90
```

```
3d_loom_pg.html x stylesheet.css x
91 #test_button{
92     display: inline-block;
93     margin: auto;
94     background-color: none;
95     border: none;
96 }
97
98 .buttons {
99     width: 450px;
100     height: 50px;
101     cursor: pointer;
102     border: 1px solid red;
103 }
104
105 #part1{
106     width: 300px;
107     height: 50px;
108     cursor: pointer;
109 }
110
111 #part2{
112     width: 300px;
113     height: 50px;
114     cursor: pointer;
115 }
116
117 #part3{
118     width: 300px;
119     height: 50px;
120     cursor: pointer;
121 }
122
123 #part4{
124     width: 300px;
125     height: 50px;
126     cursor: pointer;
127 }
128
129 #part5{
130     width: 300px;
131     height: 50px;
132     cursor: pointer;
133 }
134
135 #part6{
136     width: 300px;
137     height: 50px;
138     cursor: pointer;
139 }
140
141 #part7{
142     width: 300px;
143     height: 50px;
144     cursor: pointer;
145 }
146
147 #part8{
148     width: 300px;
149     height: 50px;
150     cursor: pointer;
151 }
152
153 #part9{
154     width: 300px;
155     height: 50px;
156     cursor: pointer;
157 }
158
159 #part10{
160     width: 300px;
161     height: 50px;
162     cursor: pointer;
163 }
164
165 .instructions_section{
166     text-align: center;
167     padding: 5px;
168 }
169
170 .instructions_section a{
171     color: white;
172     text-decoration: none;
173     font-weight: bold;
174     background-color: black;
175     width: 120px;
176     height: 50px;
177     display: inline-block;
178     transition: 0.5s;
179 }
180
181 .instructions_section a:hover{
182     background-color: white;
183     transition: 0.5s;
184     color: black;
185 }
186
187 .part_image {
188     width: 100%;
189     height: 100px;
190     border: 2px solid black;
191 }
192
193 .part_content{
194     text-align: center;
195 }
```

The Outcome on the Web Page



The Individual 3D Loom Parts Pages

The 'three.js' Implementation

Introduction/Overview

Furthermore, following on from previous aspect, I implemented the 'three.js' code, as previously shown, on one of the separate pages to visualise how this would have appeared on the web page with a description underneath of that specific part. For this stage a 'lorem ipsum' generator was utilised for the purpose of visually showing placeholder text to gauge how this would have appeared on the web page. As will be evident, the 3D cube appeared with the placeholder text below with the heading placed at the top of the page.

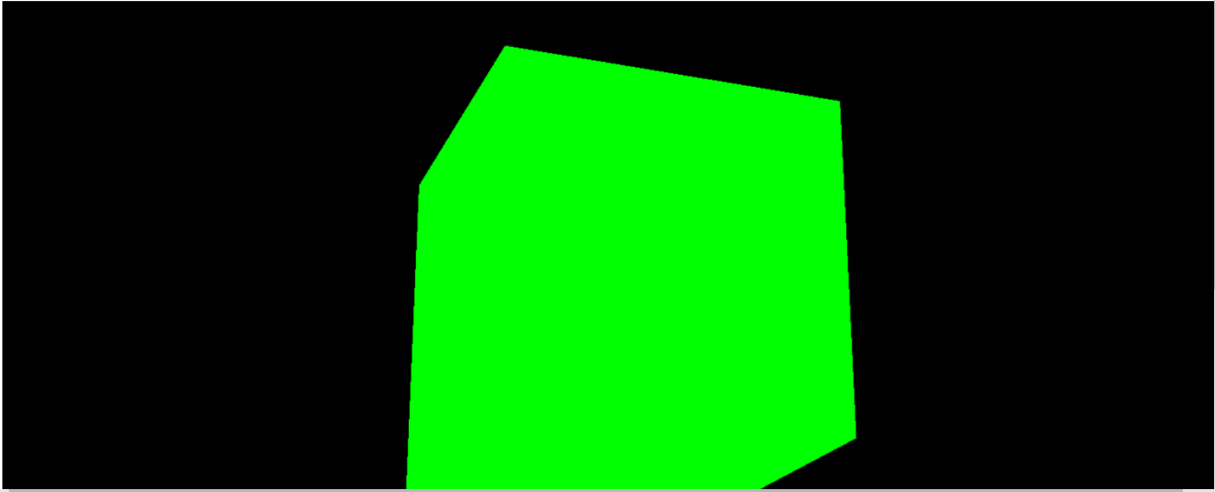
The Code at this Stage

```
3d_loom_pg.html x part2.html x stylesheet.css x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <title>Part 2</title>
5   <meta charset="utf-8">
6   <link rel="stylesheet" href="stylesheet.css">
7   <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8 </head>
9
10 <body>
11 <div class="row">
12 <div class="col-12">
13   <div class="banner">
14     <h1>Shaft/Harness</h1>
15     <a href="#" onclick="window.close();"><p>Return to 3D Loom Page</p></a> <!--https://stackoverflow.com/questions/2076299/how-to-close-current-tab-in-a-browser-window - REFERENCE-->
16   </div>
17 </div>
18 </div>
19 <script src="is/three.js"></script>
20 <script>
21   var scene = new THREE.Scene();
22   var camera = new THREE.PerspectiveCamera( 20, window.innerWidth/window.innerHeight, 1, 1000 );
23
24   var renderer = new THREE.WebGLRenderer();
25   renderer.setSize( window.innerWidth, window.innerHeight );
26   document.body.appendChild( renderer.domElement );
27
28   var geometry = new THREE.BoxGeometry( 1, 1, 1 );
29   var material = new THREE.MeshBasicMaterial( { color: 0x00ff00 } );
30   var cube = new THREE.Mesh( geometry, material );
31   scene.add( cube );
32
33   camera.position.z = 5;
34
35   var animate = function () {
36     requestAnimationFrame( animate );
37
38     cube.rotation.x += 0.01;
39     cube.rotation.y += 0.01;
40
41     renderer.render(scene, camera);
42   };
43
44   animate();
45 </script>
46
47 <div class="row">
48 <div class="col-12">
49   <div class="part-content">
50     <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.</p>
51   </div>
52 </div>
53 </div>
54 </body>
55
56 </html>
```

The Outcome on the Page

Shaft/Harness

[Return to 3D Loom Page](#)



Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.

The Other Pages

Introduction/Overview

With regards to the other separate pages, I simply placed a placeholder image to represent where the interactive part of the 3D model would have been situated on the page with text underneath. This was similar to the example shown above.

I also managed to find some code that would have allowed for the user to return to the original page they were viewing through a link. Allowing for the user to return to the page was something that was difficult as I attempted many different pieces of code researched on the Internet but they wouldn't function properly. The 'onclick' related to the fact that when the user selected the link, the window would have closed. After selecting the link, the browser would have then displayed a box which would have asked the user if they were sure that they wanted to close the page. If 'Yes' was selected, then the web page would have closed down but if 'No' was selected, then the user would have remained on the current page.

The Code at this Stage

The 'HTML' Code for 'part1.html'

```
part1.html
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <title>Part 1</title>
5   <meta charset="utf-8">
6   <link rel="stylesheet" href="stylesheet.css">
7   <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8 </head>
9
10 <body>
11 <div class="row">
12 <div class="col-12">
13 <div class="banner">
14 <h1>Warp Beam</h1>
15 <a href="#" onclick="window.close();"><p>Return to 3D Loom Page</p></a> <!--https://stackoverflow.com/questions/2076299/how-to-close-current-tab-in-a-browser-window - REFERENCE-->
16 </div>
17 </div>
18 </div>
19
20 <div class="row">
21 <div class="col-12">
22 
23 </div>
24 </div>
25
26 <div class="row">
27 <div class="col-12">
28 <div class="part_content">
29 <p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.</p>
30 </div>
31 </div>
32 </div>
33
34 </body>
35
36 </html>
```

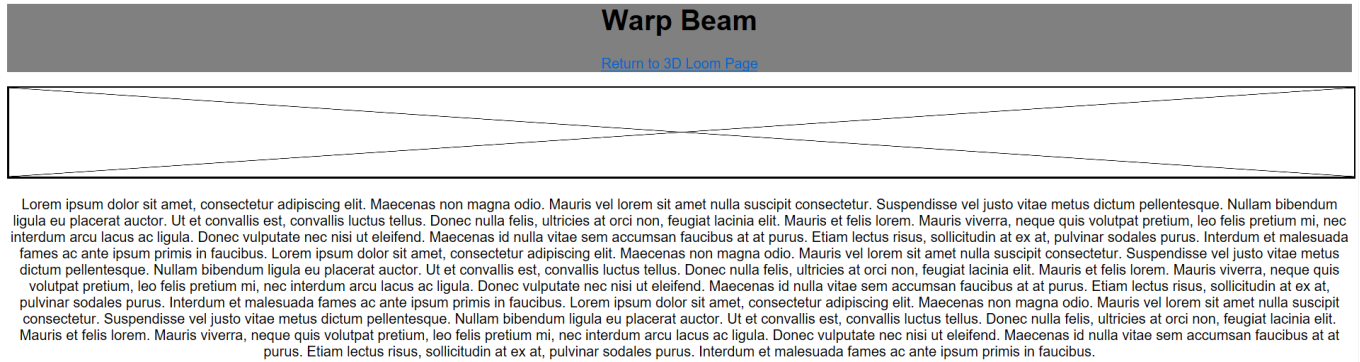
The Code to Allow for Closing of the Current Window

```
<body>
<div class="row">
<div class="col-12">
  <div class="banner">
    <h1>Warp Beam</h1>
    <a href="#" onclick="window.close();"><p>Return to 3D Loom Page</p></a>
  </div>
</div>
</div>
```

'Whitchurch Silk Mill' Project (Y2S2) Development Process Document – Daniel Wilkins

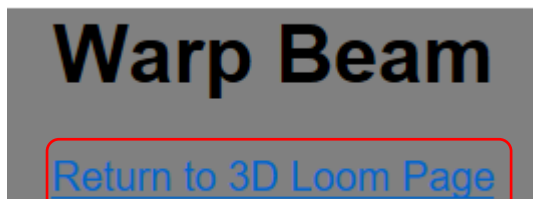
The Outcome on the Web Page

The Outcome Regarding the General Appearance for 'part1.html'

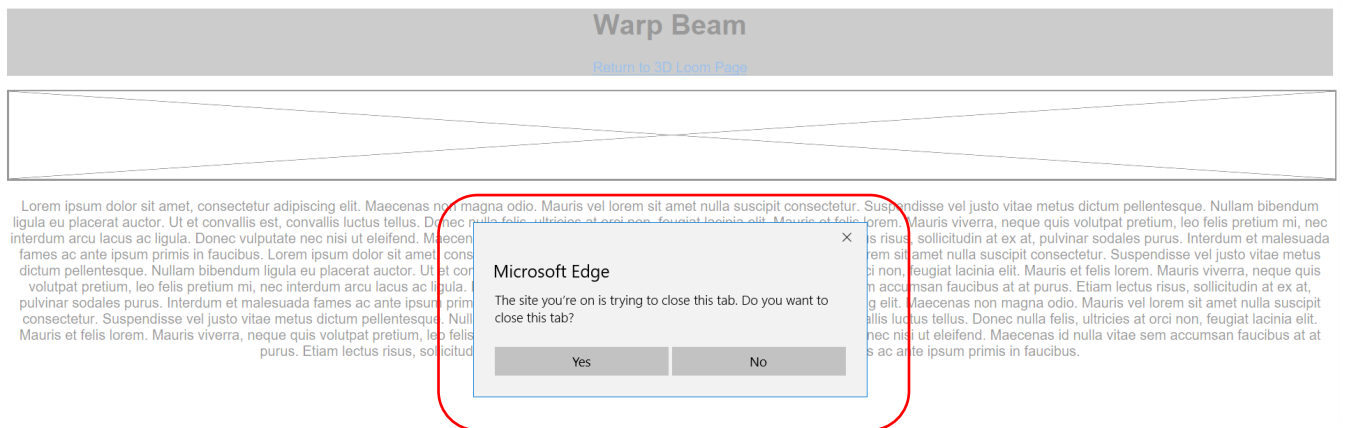


The Outcome Regarding Returning to the Previous Page

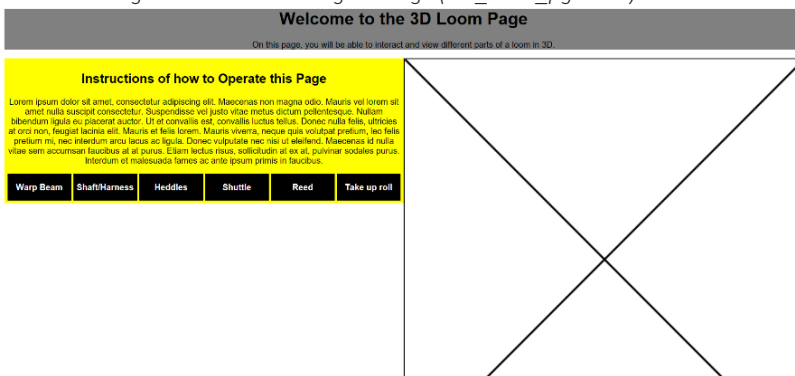
The Link for the User to Select



The User Being Asked if they are Sure they Wish to Close the Window



The User Being Returned to the Original Page ('3d_loom_pg.html')



The Third Prototype of the Web Page(s)

Introduction/Overview

With regards to the third prototype, I had been trying different elements of code to allow for an actual 3D model to be shown on a web page which the user could have interacted with. I added a navigation bar, of which I looked at 'Whitchurch Silk Mill's' website, and footer in this prototype to the web page as well as a few other elements.

Viewing 'Whitchurch Silk Mill's' Website Regarding the Navigation Bar for Inspiration



The screenshot displays the Whitchurch Silk Mill website. At the top, there is a header with a logo of a mill building on the left, the text 'WHITCHURCH SILK MILL' in a large, purple, serif font in the center, and 'Living Weaving Heritage' in a smaller, italicized font below it. To the right of the header is a search bar with a magnifying glass icon and the text 'search...'. Below the header is a navigation bar with a red border, containing links: Home, Visit us, Events, Shop, Silk weaving, Support us, and Contact us. The main content area is divided into two columns. The left column has a 'Home' section with links to 'History of the mill' and 'About us', and a 'LATEST NEWS' section with several news items. The right column has a 'Whitchurch Silk Mill' section with three images: a mill building, a loom, and a close-up of a loom. Below the images is a 'Welcome to Whitchurch Silk Mill' section with a paragraph of text and a 'the good exchange' logo.

Home

- [History of the mill](#)
- [About us](#)

LATEST NEWS

- [Help us go for Gold!](#)
- [Shop Open](#)
- [Volunteer Coffee Afternoon](#)
- [Milling About: Schools Outreach Workshops](#)
- [Amusing Museums](#)

Whitchurch Silk Mill

This website uses cookies to make it easier for you to use. To find out more about cookies and their use, [click here](#). If you are happy to use the site as normal, [click here](#).

Welcome to Whitchurch Silk Mill

A gem of industrial heritage in beautiful, rural Hampshire

The Mill and Riverside Cafe are now closed for refurbishment as part of our Heritage Lottery Funded 'Preserving the Fabric Project'. Please follow us on [social media](#) to find out when our pop-up shop is open over the coming months. The Mill, Cafe and Shop are due to re-open August 2018.

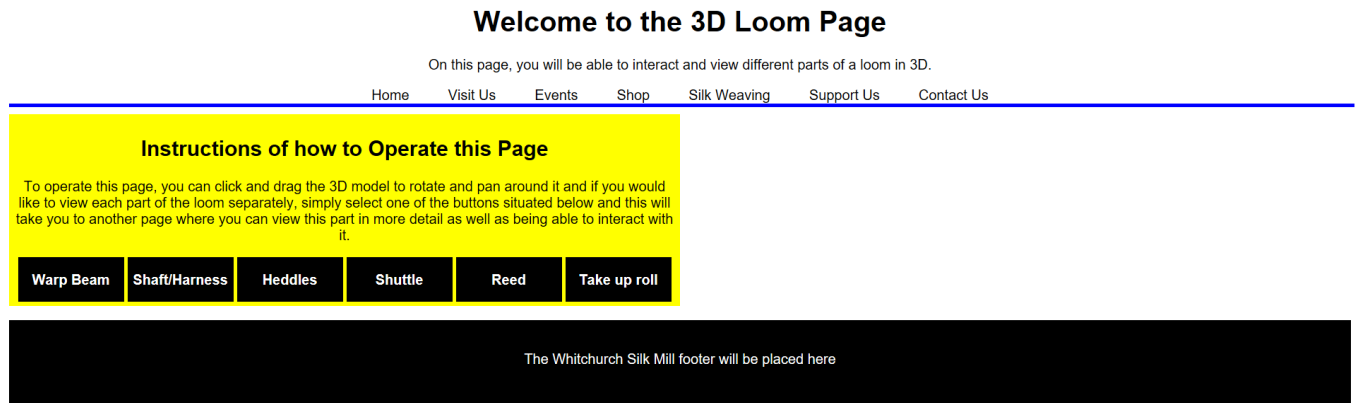
the good exchange

Attempting to Load a 3D Model into the Project

Introduction/Overview

As is evident below the animating cube didn't display on the web page. This was because I was experimenting with inserting an 'obj' loader into the web page to allow for an actual 3D model to appear, as informed via research and looking at examples. This was something which proved to be difficult and the various methods of how I tried to solve this will be highlighted in the different prototypes.

The Issue Explained Above



Undertaking Further Attempts

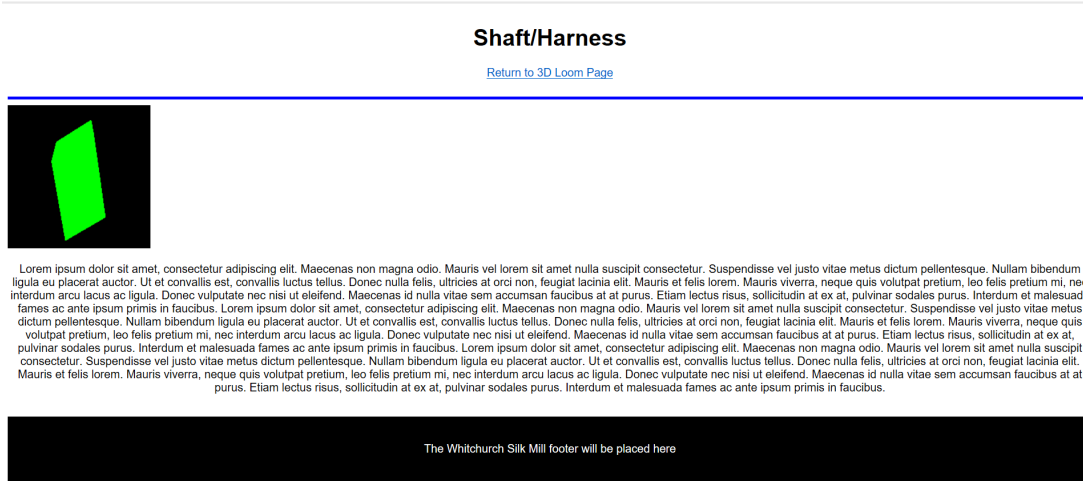
Further Attempt 1

Introduction/Overview

I then continued to experiment with the animating cube on a web page. Continuing with understanding the animating cube from the previous prototype, from communicating with the other developer, I soon realised that there was an element which determined the size of the 'scene' when displaying the animating cube. I had been experimenting with several different pieces of code to understand this but once discussing I soon realised what was occurring.

I had been attempting to change the width and height of the 'scene' as shown on an example online. The solution was to resize the renderer by changing the values inside 'renderer.setSize()'. I understood that the values at the current time, as shown below, caused the width and height to be the size of the window when loaded.

The Original Problem of Resizing the Scene as Displayed Online



```
20 <script>
21     var scene = new THREE.Scene();
22     var camera = new THREE.PerspectiveCamera( 20, window.innerWidth/window.innerHeight, 1, 1000 );
23
24     var renderer = new THREE.WebGLRenderer();
25     renderer.setSize( window.innerWidth, window.innerHeight );
26     document.body.appendChild( renderer.domElement );
27
28     var geometry = new THREE.BoxGeometry( 1, 1, 1 );
29     var material = new THREE.MeshBasicMaterial( { color: 0x00ff00 } );
30     var cube = new THREE.Mesh( geometry, material );
31     scene.add( cube );
32
33     camera.position.z = 5;
34
35     var animate = function () {
36         requestAnimationFrame( animate );
37
38         cube.rotation.x += 0.01;
39         cube.rotation.y += 0.01;
40
41         renderer.render(scene, camera);
42     };
43
44     animate();
45 </script>
```

The Online Example

```
// set the scene size
var WIDTH = 400,
    HEIGHT = 300;

// set some camera attributes
var VIEW_ANGLE = 45,
    ASPECT = WIDTH / HEIGHT,
    NEAR = 0.1,
    FAR = 10000;

// get the DOM element to attach to
// - assume we've got jQuery to hand
var $container = $('#container');

// create a WebGL renderer, camera
// and a scene
var renderer = new THREE.WebGLRenderer();
var camera = new THREE.PerspectiveCamera(
    VIEW_ANGLE,
    ASPECT,
    NEAR,
    FAR );

var scene = new THREE.Scene();

// the camera starts at 0,0,0 so pull it back
camera.position.z = 300;

// start the renderer
renderer.setSize(WIDTH, HEIGHT);

// attach the render-supplied DOM element
$container.append(renderer.domElement);
```

(Lewis, 2011)

'Whitchurch Silk Mill' Project (Y2S2) Development Process Document – Daniel Wilkins

Changing the Size of the Renderer Instead

Introduction/Overview

As is evident below, I resized the window to be very small and then refreshed the web page and expanded the window and the renderer remained the size of the window. To actually change the width and height of the renderer, I was informed by research online that values such as the ones shown below had to be entered.

The Initial Changed Renderer Size

The Code

```
var renderer = new THREE.WebGLRenderer();  
renderer.setSize( window.innerWidth, window.innerHeight );  
document.body.appendChild( renderer.domElement );
```

The Outcome on the Web Page

Shaft/Harness

[Return to 3D Loom Page](#)



Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.

The Values that Needed to be Inputted Instead

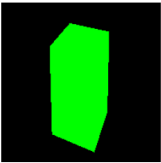
The Code at this Stage

```
var scene = new THREE.Scene();  
var camera = new THREE.PerspectiveCamera( 20, window.innerWidth/window.innerHeight, 1, 1000 );  
var renderer = new THREE.WebGLRenderer();  
renderer.setSize(200, 200); //https://stackoverflow.com/questions/19827030/renderer-setsizes-calc  
com/questions/12583528/positioning-the-three-js-container-as-an-html-div https://github.com/mrdo  
document.body.appendChild( renderer.domElement );
```

The Outcome on the Web Page

Shaft/Harness

[Return to 3D Loom Page](#)



Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.

The Whitchurch Silk Mill footer will be placed here

Attempting to Position the Animating Cube

Introduction/Overview

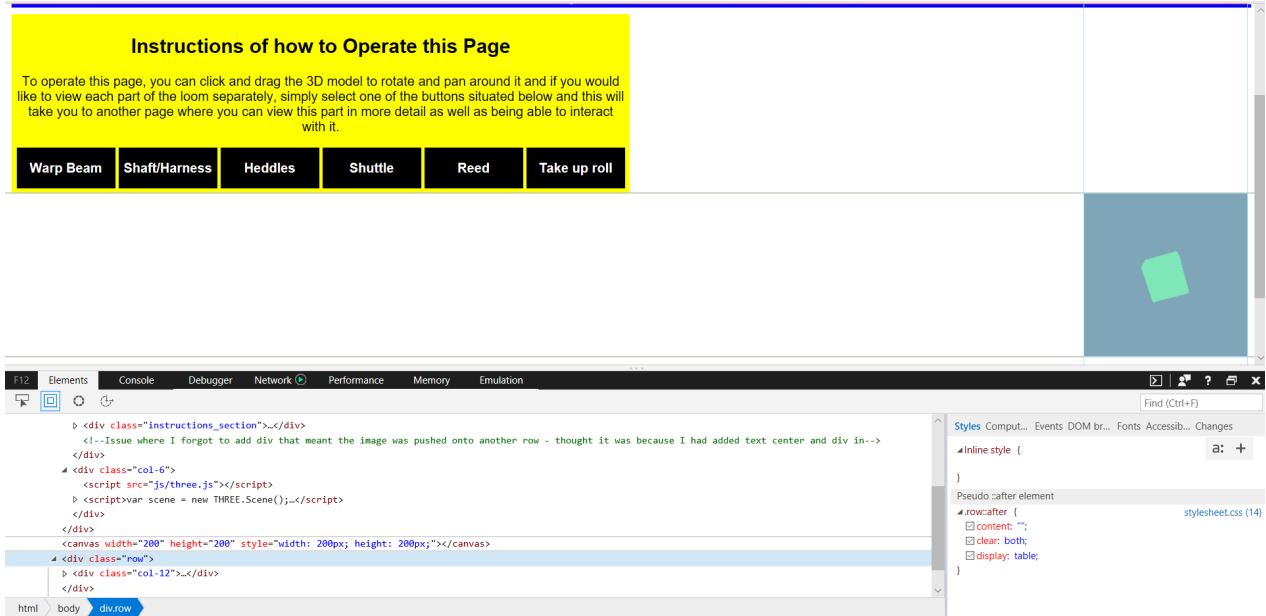
I then tried to place the animating cube next to the text and buttons as shown previously on the wireframes. However, this proved to be difficult to produce. As is evident below, I attempted to place the 'script' tags inside of a 'div'. However, from utilising the 'inspector' tool, it was obvious that there was a 'canvas' element which appeared outside of the 'div' which caused the animating cube and its scene to appear underneath the text and links to the left.

This was an issue that was left as it was soon realised that I needed to focus on implementing an 'obj' file into a web page rather than drawing using code as the designer would be supplying the 3D models in 'obj' file format. This was the next task.

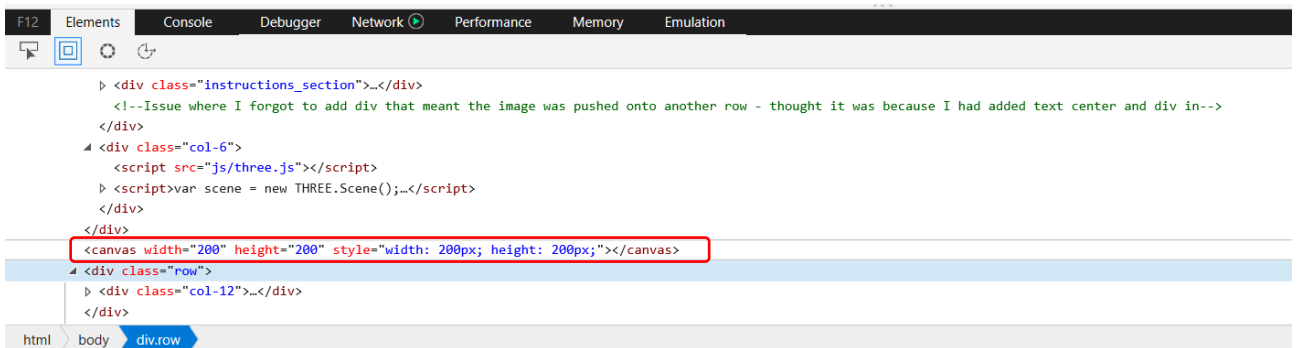
Placing the 'script' Tags Inside of a 'div'

```
51
52     <div class="col-6">
53
54     <script src="js/three.js"></script>
55
56     <script>
57
58         var scene = new THREE.Scene();
59         var camera = new THREE.PerspectiveCamera( 50, 200/200, 1, 1000 );
60         var renderer = new THREE.WebGLRenderer();
61         renderer.setSize(200, 200); //https://stackoverflow.com/questions/1982703/
62         document.body.appendChild( renderer.domElement );
63
64         var geometry = new THREE.BoxGeometry( 1, 1, 1 );
65         var material = new THREE.MeshBasicMaterial( { color: 0x00ff00 } );
66         var cube = new THREE.Mesh( geometry, material );
67         scene.add( cube );
68
69         camera.position.z = 5;
70
71         var animate = function () {
72             requestAnimationFrame( animate );
73
74             cube.rotation.x += 0.01;
75             cube.rotation.y += 0.01;
76
77             renderer.render(scene, camera);
78         };
79
80         animate();
81     </script>
82
83
84 </script>
85
86
87 </div>
88 </div>
89
```

The Outcome on the Web Page (This Didn't Work)



Utilising the 'inspector' Tool, Highlighting the 'canvas' Element Outside of the 'div'



The Fourth Prototype of the Web Page(s)

Attempting to Place a 3D model Onto the Web Page Continued

Attempt 1

Introduction/Overview

To begin this task, I first of all viewed the 'threejs.org' website where I copied and experimented with the code shown below. I downloaded a couple of 3D models from 'TurboSquid' to help myself experiment with an 'obj loader'. These can also be viewed below.

However, unfortunately, this didn't work as, from my understanding, the scene had loaded but not the 3D model.

Integrating Code from the 'threejs.org' Website

```
<script src="js/three.js"></script>
<script>
  var scene = new THREE.Scene(); //Tried to use this source to resize canvas element - https://www.html5rocks.com/en/tutorials/three/intro/
  var camera = new THREE.PerspectiveCamera( 20, window.innerWidth/window.innerHeight, 1, 1000 );

  var renderer = new THREE.WebGLRenderer();
  renderer.setSize( window.innerWidth, window.innerHeight );
  document.body.appendChild( renderer.domElement );

  var geometry = new THREE.BoxGeometry( 0.2, 0.2, 0.2 );
  var material = new THREE.MeshBasicMaterial( { color: 0x00ff00 } );
  var cube = new THREE.Mesh( geometry, material ); //Same code as used in previous prototype but added some more in from another website for obj - https://threejs.org/docs/#examples/loaders/ObjLoader

  // instantiate a loader
  var loader = new THREE.OBJLoader(); //Tried this to try and get obj file to appear in web page - https://www.turbosquid.com/ reference models used

  // load a resource
  loader.load(
    // resource URL
    'files/simple_table.obj',
    // called when resource is loaded
    function ( object ) {
      scene.add( object );
    },
    // called when loading is in progress
    function ( xhr ) {
      console.log( ( xhr.loaded / xhr.total * 100 ) + '% loaded' );
    },
    // called when loading has errors
    function ( error ) {
      console.log( 'An error happened' );
    }
  );
</script>
```

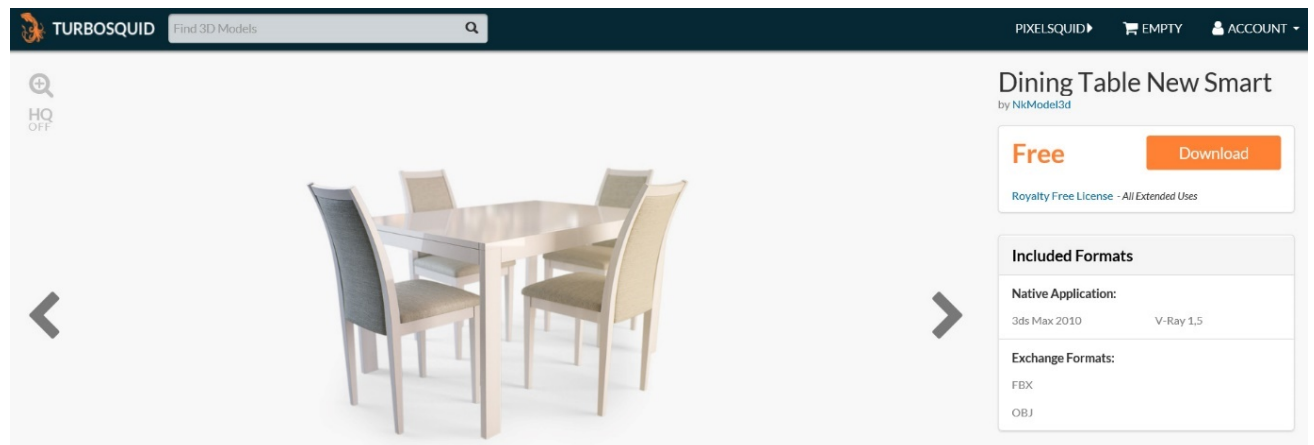
Downloading 3D Models from 'TurboSquid'

The First 3D Model

Introduction/Overview

The model below was downloaded first but then I realised that the file format wasn't an 'obj' but a 'rar' instead so this wasn't used.

The Actual 3D Model

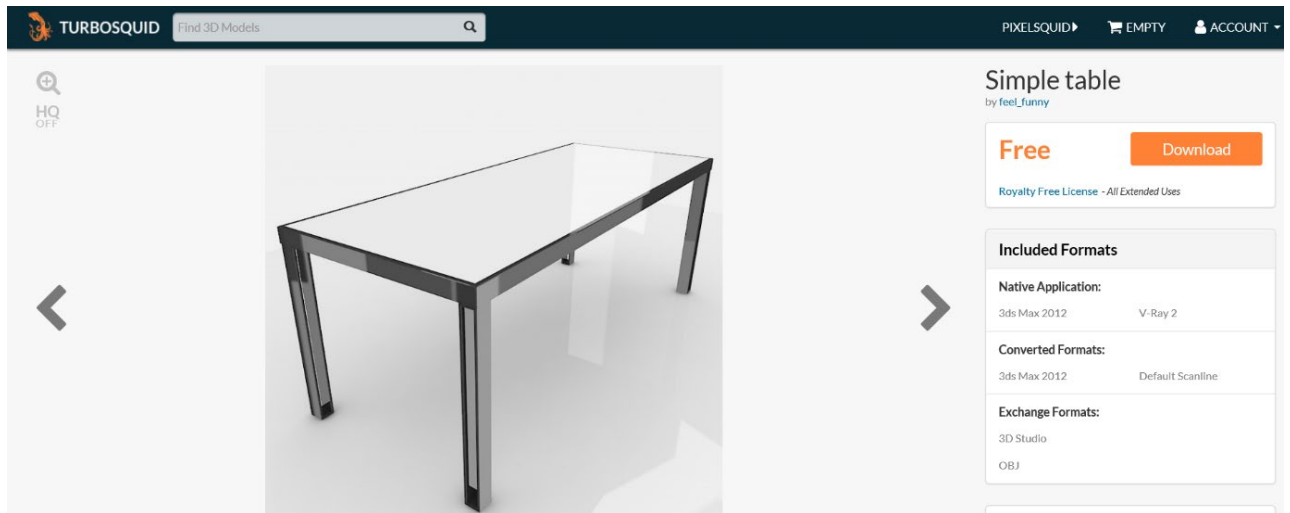


The Second 3D Model

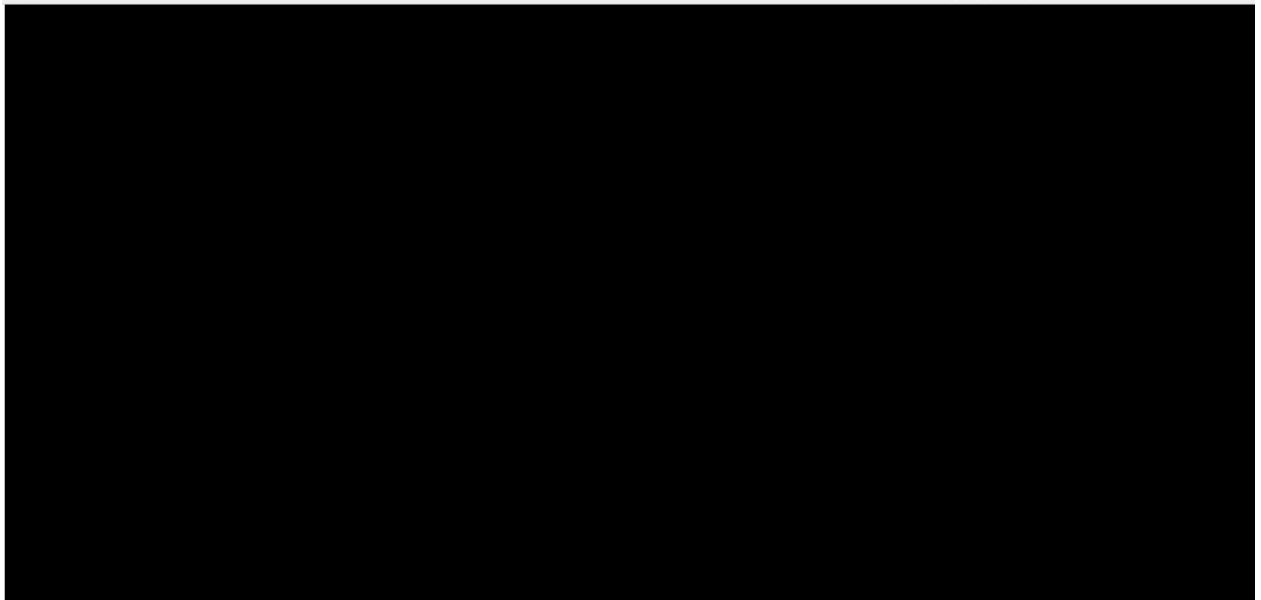
Introduction/Overview

This was the file that was used as this was in the format of an ‘obj’ once downloaded.

The Actual 3D Model



The Outcome on the Web Page (This Didn't Work)



Attempt 2

Introduction/Overview

I then continued with another piece of code I found via the Internet to try and allow for this to function properly. However, again, this didn’t work and the outcome was exactly the same as the previous attempt.

The Integrated ‘JavaScript’ Code

```
3d_loom_pg.html x
37
38 <script src="js/build/three.js"></script>
39 <script src="js/examples/js/loaders/OBJLoader.js"></script>
40
41
42 <script>
43
44     var container;
45
46     var camera, scene, renderer;
47
48     var mouseX = 0, mouseY = 0;
49
50     var windowHalfX = window.innerWidth / 2;
51     var windowHalfY = window.innerHeight / 2;
52
53
54     init();
55     animate();
56
57
58     function init() {
59
60         container = document.createElement( 'div' );
61         document.body.appendChild( container );
62
63         camera = new THREE.PerspectiveCamera( 45, window.innerWidth / window.innerHeight, 1, 2000 );
64         camera.position.z = 250;
65
66         // scene
67
68         scene = new THREE.Scene();
69
70         var ambientLight = new THREE.AmbientLight( 0xaaaaaa, 0.4 );
71         scene.add( ambientLight );
72
73         var pointLight = new THREE.PointLight( 0xffffff, 0.8 );
74         camera.add( pointLight );
75         scene.add( camera );
76
77         // texture
78
79         var manager = new THREE.LoadingManager();
80         manager.onProgress = function ( item, loaded, total ) {
81             console.log( item, loaded, total );
82
83         };
84
85         var textureLoader = new THREE.TextureLoader( manager );
86         var texture = textureLoader.load( 'textures/UV_Grid_Sm.jpg' );
87
88     }
```



```
88
89 // model
90
91 var onProgress = function ( xhr ) {
92     if ( xhr.lengthComputable ) {
93         var percentComplete = xhr.loaded / xhr.total * 100;
94         console.log( Math.round(percentComplete, 2) + '% downloaded' );
95     }
96 };
97
98 var onError = function ( xhr ) {
99 };
100
101 var loader = new THREE.OBJLoader( manager );
102 loader.load( 'files/simple_table.obj', function ( object ) {
103
104     object.traverse( function ( child ) {
105
106         if ( child instanceof THREE.Mesh ) {
107
108             child.material.map = texture;
109
110         }
111
112     } );
113
114     object.position.y = - 95;
115     scene.add( object );
116
117 }, onProgress, onError );
118
119 //
120
121 renderer = new THREE.WebGLRenderer();
122 renderer.setPixelRatio( window.devicePixelRatio );
123 renderer.setSize( window.innerWidth, window.innerHeight );
124 container.appendChild( renderer.domElement );
125
126 document.addEventListener( 'mousemove', onDocumentMouseMove, false );
127
128 //
129
130 window.addEventListener( 'resize', onWindowResize, false );
131
132 }
133
```

```
134
135 function onWindowResize() {
136
137     windowHalfX = window.innerWidth / 2;
138     windowHalfY = window.innerHeight / 2;
139
140     camera.aspect = window.innerWidth / window.innerHeight;
141     camera.updateProjectionMatrix();
142
143     renderer.setSize( window.innerWidth, window.innerHeight );
144
145 }
146
147 function onDocumentMouseMove( event ) {
148
149     mouseX = ( event.clientX - windowHalfX ) / 2;
150     mouseY = ( event.clientY - windowHalfY ) / 2;
151
152 }
153
154 //
155
156 function animate() {
157
158     requestAnimationFrame( animate );
159     render();
160
161 }
162
163 function render() {
164
165     camera.position.x += ( mouseX - camera.position.x ) * .05;
166     camera.position.y += ( - mouseY - camera.position.y ) * .05;
167
168     camera.lookAt( scene.position );
169
170     renderer.render( scene, camera );
171
172 }
173
174 </script> <!--Used this for this code - https://github.com/mrdoob/three.js/blob/master/examples/webgl_loader_obj.html-->
175 <!--Used this for code - https://threejs.org/examples/#webgl_loader_obj-->
```

The Outcome on the Web Page (The Same Result)



Attempt 3

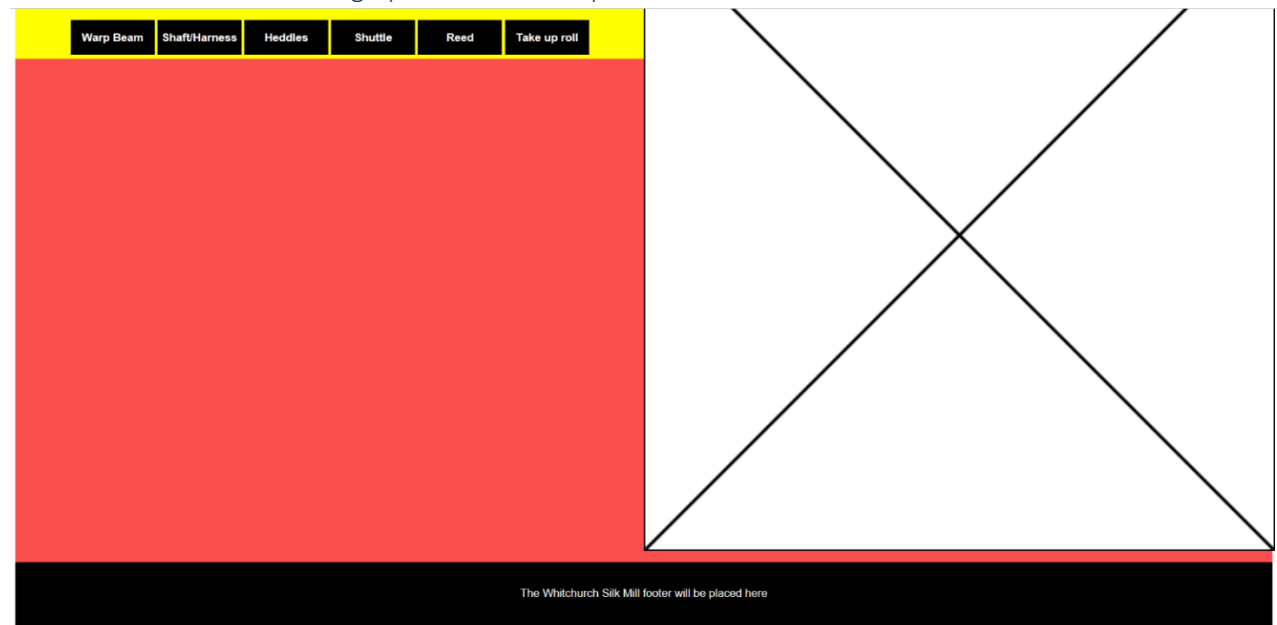
Introduction/Overview

I then continued with how to solve the problem by looking at another example on 'YouTube'. As is evident below, I was instructed to place the file paths in the 'head' tag first of all. I then integrated the code shown, adding the following piece highlighted below. However, again, this didn't work and caused the scene to disappear as well.

Placing the File Paths in the 'head' Tag and Integrating Further Code

```
3d_loom_pg.html x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <title>3D Loom Page</title>
5   <meta charset="utf-8">
6   <link rel="stylesheet" href="stylesheet.css">
7   <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8   <script src="js/OBJLoader.js"></script>
9   <script src="js/MTLLoader.js"></script>
10  <script src="js/three.js"></script>
11  <script src="js/three.min.js"></script>
12 </head>
13
52
53 <script src="js/three.js"></script>
54   <script src="js/OBJLoader.js"></script>
55   <script src="js/MTLLoader.js"></script>
56   <script src="js/three.min.js"></script>
57
58 <script>
59
60
61
62 var scene = new THREE.scene; //Link used - https://www.youtube.com/watch?v=q2dhg1e8kpw
63 var camera = new THREE.PerspectiveCamera( 20, window.innerWidth/window.innerHeight, 1, 1000 );
64
65 var renderer = new THREE.WebGLRenderer();
66   renderer.setSize( window.innerWidth, window.innerHeight );
67   document.body.appendChild( renderer.domElement );
68   var objloader = new THREE.OBJLoader();
69   objloader.setMaterials(materials);
70
71   objloader.load("files/simple_table.obj", function(mesh){
72     scene.add(mesh);
73   });
74
75
76 </script>
77
```

The Outcome on the Web Page (This Didn't Work)



Further Attempts

Experimenting with Other Pieces of Code

Introduction/Overview

I also then tried experimenting with lots of different pieces of code which can be viewed below but they didn't work either.

The Different Pieces of Code Experimented with

```
83
84 <script> Reference - https://stackoverflow.com/questions/10888479/render-obj-file-using-three-objloader
85 var scene = new THREE.Scene();
86 var objloader = new THREE.OBJLoader();
87 var material = new THREE.MeshBasicMaterial({color: 'yellow', side: THREE.DoubleSide});
88 objloader.load('files/simple_table.obj', function (obj) {
89     obj.traverse(function (child) {
90
91         if (child instanceof THREE.Mesh) {
92             child.material = material;
93         }
94     });
95 });
96 scene.add(obj);
97 });
98 </script>
99 <script> Reference - https://stackoverflow.com/questions/43621096/cant-render-obj-using-objloader-js
100 var manager = new THREE.LoadingManager();
101 var loader = new THREE.OBJLoader(manager);
102 var fileloader = new THREE.FileLoader();
103 fileloader.load('simpletable.obj', function(data){
104
105     var object = loader.parse(data);
106     object.scale.set(0.5, 0.5, 0.5);
107     scene.add(object);
108 },
109     function (xhr) {
110         console.log((xhr.loaded / xhr.total * 100) + '% loaded');
111     },
112     //if download fails
113     function (xhr) {
114         //console.error('An error happened : ' + xhr);
115     }
116 );
117 </script>
```

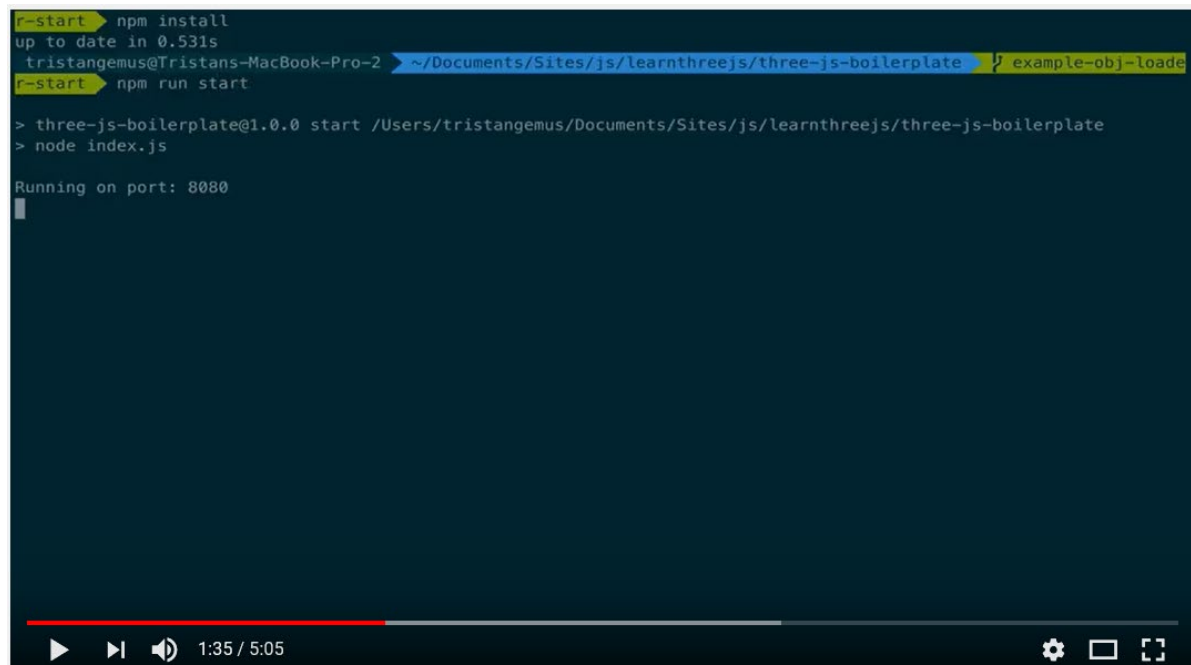
```
120
121 <!--Use this to help https://www.learnthreejs.com/load-3d-model-using-three-js-obj-loader/-->
122 <script> //Reference if used - https://www.youtube.com/watch?v=wHuSQ7IlaKs
123
124 var scene = new THREE.Scene();
125 var camera = new THREE.PerspectiveCamera( 75, window.innerWidth/window.innerHeight, 0.1, 1000);
126
127 var renderer = new THREE.WebGLRenderer();
128 renderer.setSize( window.innerWidth, window.innerHeight);
129 document.body.appendChild( renderer.domElement );
130
131 var geometry = new THREE.BoxGeometry(1, 1, 1);
132 var material = new THREE.MeshBasicMaterial( { color: 0x00ff00} );
133
134 camera.position.z = 200;
135
136 var controls = new THREE.OrbitControls(camera, renderer.domElement);
137 controls.enableDamping = true;
138 controls.dampingFactor = 0.25;
139 controls.enableZoom = true;
140
141 var objLoader = new THREE.ObjectLoader();
142 objLoader.setPath('/files/');
143 objLoader.load('simpletable.obj', function(object){
144     object.position.y -= 60;
145     scene.add(object);
146 });
147
148 var animate = function () {
149     requestAnimationFrame( animate );
150
151     controls.update();
152
153     renderer.render(scene, camera);
154
155 };
156
157 animate();
158 </script>
159
160
```

Connecting to an ‘npm’ Server

Introduction/Overview

From something mentioned on a ‘YouTube’ video, I wondered if this was the reason why the ‘obj loader’ wasn’t working. This was the fact that it mentioned that I would have had to have connected to an ‘npm’ server but I was unsure whether to undertake this as I was unsure of what I was doing and didn’t want to cause any unnecessary damage to my laptop.

The Advice of an ‘npm’ Server



```
r-start> npm install
up to date in 0.531s
tristangemus@Tristans-MacBook-Pro-2 ~/Documents/Sites/js/learnthreejs/three-js-boilerplate
r-start> npm run start

> three-js-boilerplate@1.0.0 start /Users/tristangemus/Documents/Sites/js/learnthreejs/three-js-boilerplate
> node index.js

Running on port: 8080
```

The screenshot shows a terminal window with the following content:
r-start> npm install
up to date in 0.531s
tristangemus@Tristans-MacBook-Pro-2 ~/Documents/Sites/js/learnthreejs/three-js-boilerplate
r-start> npm run start
The output shows the command 'three-js-boilerplate@1.0.0 start /Users/tristangemus/Documents/Sites/js/learnthreejs/three-js-boilerplate' and 'node index.js' being executed, resulting in 'Running on port: 8080'.
At the bottom of the image, there is a video player interface with a progress bar at 1:35 / 5:05 and standard playback controls.

Utilising ‘Unity’

Introduction/Overview

I also viewed a way of implementing a 3D model onto a web page in ‘Unity’, as this was the way the other developer was producing his in my group. However, from understanding, this wasn’t an effective way as the other developer explained that this wouldn’t have worked on mobile devices.

Therefore, I thought I would leave this aspect for the current time and I continued with developing the web page.

Further Developing the Web Page

Adding Relevant Loom Parts to the Main Web Page

Introduction/Overview

From receiving a technical document from the client which provided details of the very specific parts of the loom, I then selected the parts which I thought would have been the most relevant and placed them on the 3D loom page as links to their separate pages.

Problems Experienced

Links Being Placed Outside of Their Boxes/Containers

Introduction/Overview

As is evident below, there was an issue with the text being placed outside of the black boxes. The links would have still worked but visually, this wasn't correct.

The Current Problem

below and this will take you to another page where you can view this part in more detail as well as being able to interact with it through clicking and dragging the model to rotate and pan.

	
Tapet Barrel	Frame and Harness
	
Take-up Mechanism	Loose Reed
	
Picking	Knock-off Mechanism
	
Sley	Sley Board
	
Rocking Shaft	Breast Beam
	
Guard	Cloth Beam
	
Back Beam	Shafts and Gears
	
Motor and Guards	Starting Handle
	
Bearings	

'Whitchurch Silk Mill' Project (Y2S2) Development Process Document – Daniel Wilkins

Attempted Solution 1

Introduction/Overview

To try and solve this issue, I firstly placed paragraph tags around the links which worked to an extent but then I couldn't apply 'padding' properly as will be evident below.

Placing One of the Links Inside a Paragraph

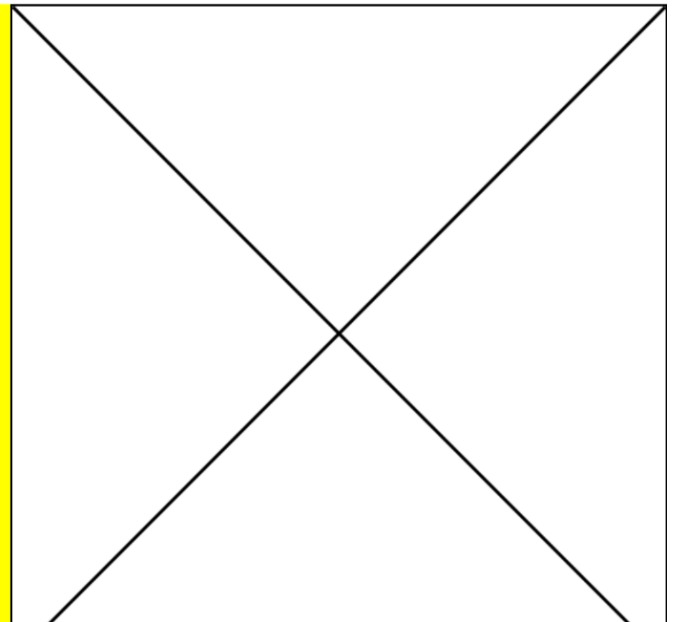
```
<p class="linkp"><a href="part1.html" target="_blank">Tappet Barrel</a></p>
<a href="part2.html" target="_blank"><p class="linkp">Frame and Harness</p></a> <br><br>
<a href="part3.html" target="_blank"><p class="linkp">Take-up Mechanism</p></a>
<a href="part4.html" target="_blank"><p class="linkp">Loose Reed</p></a> <br><br>
<a href="part5.html" target="_blank"><p class="linkp">Picking</p></a>
<a href="part6.html" target="_blank"><p class="linkp">Knock-off Mechanism</p></a> <br><br>
<a href="part7.html" target="_blank"><p class="linkp">Sley</p></a>
<a href="part8.html" target="_blank"><p class="linkp">Sley Board</p></a> <br><br>
<a href="part9.html" target="_blank"><p class="linkp">Rocking Shaft</p></a>
<a href="part10.html" target="_blank"><p class="linkp">Breast Beam</p></a> <br><br>
<a href="part11.html" target="_blank"><p class="linkp">Guard</p></a>
<a href="part12.html" target="_blank"><p class="linkp">Cloth Beam</p></a> <br><br>
<a href="part13.html" target="_blank"><p class="linkp">Back Beam</p></a>
<a href="part14.html" target="_blank"><p class="linkp">Shafts and Gears</p></a> <br><br>
<a href="part15.html" target="_blank"><p class="linkp">Motor and Guards</p></a>
<a href="part16.html" target="_blank"><p class="linkp">Starting Handle</p></a> <br><br>
<a href="part17.html" target="_blank"><p class="linkp">Bearings</p></a>
```

The Outcome of this on the Web Page (This Didn't Work)

Instructions of how to Operate this Page

To operate this page, you can click and drag the 3D model to rotate and pan around it and if you would like to view each part of the loom separately, simply select one of the buttons situated below and this will take you to another page where you can view this part in more detail as well as being able to interact with it through clicking and dragging the model to rotate and pan.

Tappet Barrel	Frame and Harness
Take-up Mechanism	Loose Reed
Picking	Knock-off Mechanism
Sley	Sley Board
Rocking Shaft	Breast Beam



Attempted Solution 2

Introduction/Overview

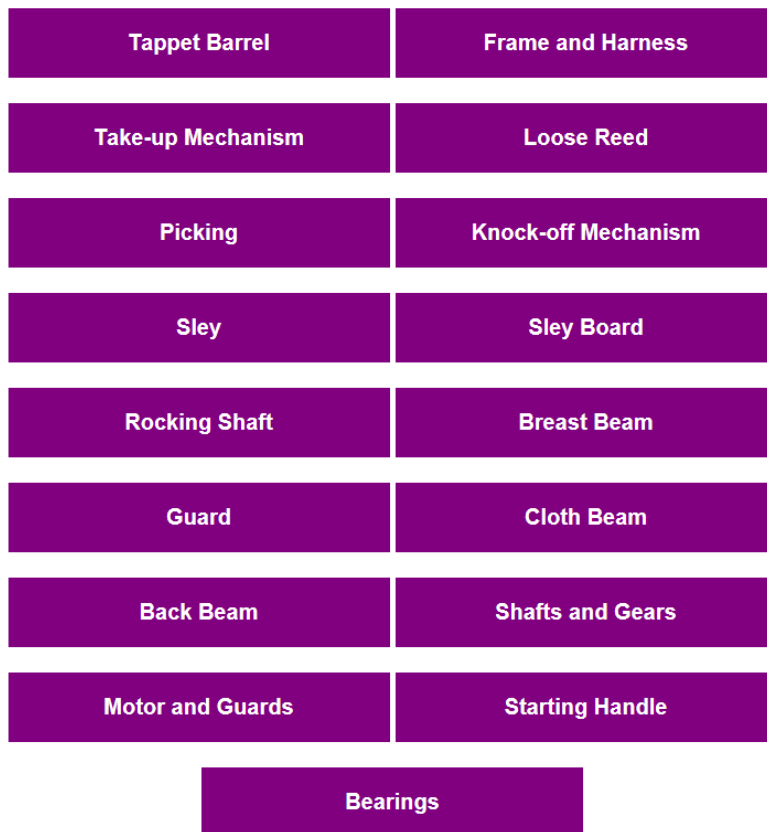
I then realised that the ‘padding’ with the paragraph in the whole section was causing part of the problem with another element being the height. So, to solve the issue, I set the padding to ‘0px’ and changed the height to ‘auto’. This then displayed the links as required in the web page. The image below of the outcome is of the project further on but this has been included to show the appearance of the links.

The Altered ‘CSS’ Code

```
193 #part10{
194     width: 300px;
195     height: 50px;
196     cursor: pointer;
197 }
198
199 .instructions_section{
200     text-align: center;
201     padding: 30px;
202 }
203
204 .instructions_section a{
205     color: white;
206     text-decoration: none;
207     font-weight: bold;
208     background-color: black;
209     width: 40%;
210     height: auto;
211     display: inline-block;
212     transition: 0.5s;
213 }
214
215 .instructions_section a:hover{
216     background-color: white;
217     transition: 0.5s;
218     color: black;
219 }
220
221
222 .linkp{
223 }
224
225
226 .instructions_section p{
227     padding-top: 0px;
228 }
229
230
231
232 .part_image {
233     width: 100%;
234     height: 250px;
235     border: 2px solid black;
236 }
237
238 .part_content{
239     text-align: center;
240 }
241
242 .responsive_break{
243     display: none;
244 }
```

'Whitchurch Silk Mill' Project (Y2S2) Development Process Document – Daniel Wilkins

The Outcome on the Web Page (This Resolved the Issue)



Adding Further Styling to the Web Pages

Introduction/Overview

I then styled the appearance of the web pages to suit both the wireframes I had created as well the current style of 'Whitchurch Silk Mill's' website.

In order to change the colour of the banner, I applied a background colour to both the 'banner' 'div' and the 'col-12styled' 'div' and I also applied a border to the bottom of the 'col-12styled' 'div' as well. I also changed the colour of the footer to be the same as the header.

The most notable change was adding in 'media queries' so that the web page could have resized with all elements in their proper positions. These can be viewed below.

The Code at this Stage

The 'HTML' and 'JavaScript' Code for the Main 3D Loom Page

```
3d_loom_pg.html x stylesheet.css x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4 <title>3D Loom Page</title> <!-- Looked at this - https://www.quora.com/What-is-a-good-way-to-put-ThreeJS-into-a-Div-->
5 <meta charset="utf-8">
6 <link rel="stylesheet" href="stylesheet.css">
7 <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!-- https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8 <script src="js/three.js"></script>
9 <script src="js/OBJLoader.js"></script>
10 <script src="js/MTLLoader.js"></script>
11 <script src="js/three.min.js"></script>
12 </head>
13
14 <body>
15
16 <div class="row">
17 <div class="col-12styled">
18 <div class="banner">
19 <h1>Welcome to the 3D Loom Page</h1>
20 <p>On this page, you will be able to interact and view different parts of a loom in 3D.</p>
21 </div>
22 </div>
23 </div>
24 <br>
25 <!--<div class="col-12" id="nav_bar_background"> <div class="navigation_bar" id="navigation">
26 <div class="navigation_bar" id="navigation">
27 <a href="#">Home</a>
28 <a href="#">Visit Us</a>
29 <a href="#">Events</a>
30 <a href="#">Shop</a>
31 <a href="#">Silk Weaving</a>
32 <a href="#">Support Us</a>
33 <a href="#">Contact Us</a>
34 <a href="#">3D Loom Page</a>
35 </div>
36 </div-->
37
38 <!--<hr id="hr">-->
39
40 <div class="row">
41 <div class="col-6">
42 <div class="instructions_section">
43 <h2>Instructions of how to Operate this Page</h2>
44 <p>To operate this page, you can click and drag the 3D model to rotate and pan around it and if you would like to view each part of the loom separately, simply select one of the buttons situated below and this will take you to another page where you can view this part in more detail as well as being able to interact with it through clicking and dragging the model to rotate and pan.</p><br class="link_breaks"> <!-- https://www.lipsum.com/feed/html - REFERENCE THIS-->
45
46 <div class="row">
47 <div class="col-6">
48 <div class="instructions_section">
49 <h2>Instructions of how to Operate this Page</h2>
50 <p>To operate this page, you can click and drag the 3D model to rotate and pan around it and if you would like to view each part of the loom separately, simply select one of the buttons situated below and this will take you to another page where you can view this part in more detail as well as being able to interact with it through clicking and dragging the model to rotate and pan.</p><br class="link_breaks"> <!-- https://www.lipsum.com/feed/html - REFERENCE THIS-->
51
52 <a href="part1.html" target="_blank"><p class="linkp">Tappet Barrel</p></a>
53 <a href="part2.html" target="_blank"><p class="linkp">Frame and Harness</p></a> <br class="link_breaks"><br class="link_breaks">
54 <a href="part3.html" target="_blank"><p class="linkp">Take-up Mechanism</p></a>
55 <a href="part4.html" target="_blank"><p class="linkp">Loose Reed</p></a> <br class="link_breaks"><br class="link_breaks">
56 <a href="part5.html" target="_blank"><p class="linkp">Picking</p></a>
57 <a href="part6.html" target="_blank"><p class="linkp">Knock-off Mechanism</p></a> <br class="link_breaks"><br class="link_breaks">
58 <a href="part7.html" target="_blank"><p class="linkp">Sley</p></a>
59 <a href="part8.html" target="_blank"><p class="linkp">Sley Board</p></a> <br class="link_breaks"><br class="link_breaks">
60 <a href="part9.html" target="_blank"><p class="linkp">Rocking Shaft</p></a>
61 <a href="part10.html" target="_blank"><p class="linkp">Brest Beam</p></a> <br class="link_breaks"><br class="link_breaks">
62 <a href="part11.html" target="_blank"><p class="linkp">Guard</p></a>
63 <a href="part12.html" target="_blank"><p class="linkp">Cloth Beam</p></a> <br class="link_breaks"><br class="link_breaks">
64 <a href="part13.html" target="_blank"><p class="linkp">Back Beam</p></a>
65 <a href="part14.html" target="_blank"><p class="linkp">Shafts and Gears</p></a> <br class="link_breaks"><br class="link_breaks">
66 <a href="part15.html" target="_blank"><p class="linkp">Motor and Guards</p></a>
67 <a href="part16.html" target="_blank"><p class="linkp">Starting Handle</p></a> <br class="link_breaks"><br class="link_breaks">
68 <a href="part17.html" target="_blank"><p class="linkp">Bearings</p></a>
69 <!-- Information for Prototyping - https://www.linkedin.com/pulse/20141030195455-49457671-understanding-weaving-what-are-loom-->
70 </div> <!-- Issue where I forgot to add div that meant the image was pushed onto another row - thought it was because I had added text center and div in-->
71
72 <div class="col-6">
73 
74 </div>
75 </div>
76
77 <br id="footer_break">
78
79 <div class="row">
80 <div class="col-12styled2">
81 <div class="footer">
82 <p>The Whitchurch Silk Mill footer will be placed here</p>
83 </div>
84 </div>
85 </div>
86 </body>
87
88 </html>
```

The ‘CSS’ Code

Modifying the Banner

```
47
48 @media only screen and (min-width: 768px) { /*THIS IS WHAT YOU NEED TO REFER TO FOR PUTTING IN THE HTML*/
49     /*FOR DESKTOPS*/
50     .col-1 {width: 8.33%;}
51     .col-2 {width: 16.66%;}
52     .col-24 {width: 20%;}
53     .col-3 {width: 25%;}
54     .col-4 {width: 33.33%;}
55     .col-5 {width: 41.66%;}
56     .col-6 {width: 50%;}
57     .col-7 {width: 58.33%;}
58     .col-8 {width: 66.66%;}
59     .col-9 {width: 75%;}
60     .col-10 {width: 83.33%;}
61     .col-11 {width: 91.66%;}
62     .col-12 {width: 100%;} /*w3schools REFERENCE - https://www.w3schools.com/css/css_rwd_grid.asp*/
63     .col-12styled {width: 100%; background-color: rgba(128, 128, 128, 0.4); border-bottom: 2px solid black;}
64     .col-12styled2 {background-color: rgba(128, 128, 128, 0.4);}
65 }
66
67 .banner{
68     background-color: rgba(128, 128, 128, 0.01);
69     text-align: center;
70     width: 100%;
71     height: auto;
72 }
73
```

Modifying the Footer

```
246 .footer{
247     background-color: rgba(128, 128, 128, 0.01);
248     color: black;
249     height: 50px;
250     text-align: center;
251 }
252
```

Adding ‘media queries’ to the ‘CSS’ File

Mobile Devices ‘media query’

```
@media screen and (max-width: 600px) { /*REFERENCE - cherry childcare project*/
    .responsive_break{
        display: block;
    }

    .instructions_section{
        text-align: center;
        padding: 5px;
    }

    .instructions_section a{
        width: 100%;
        border-radius: 20%;
        height: auto;
        display: block;
    }

    .instructions_section p{
        padding-top: 0px;
    }

    br{
        display: none;
    }

    .part_image {
        width: 100%;
        height: auto;
        border: 2px solid black;
    }

    .col-12styled{
        background-color: rgba(128, 128, 128, 0.4); /*https://www.w3schools.com/colors/colors_picker.asp*/
        border-bottom: 2px solid black;
    }

    .col-12styled2{
        background-color: rgba(128, 128, 128, 0.4);
    }

    #footer_break{
        display: block;
    }
}
```

Tablet Devices ‘media query’

```
@media only screen and (min-width: 600px) and (max-width: 768px) { /*THI
  .instructions_section{
    text-align: center;
    padding: 5px;
  }

  .instructions_section a{
    width: 100%;
    border-radius: 20%;
    height: auto;
    display: block;
  }

  .instructions_section p{
    padding-top: 0px;
  }

  br{
    display: none;
  }

  .part_image {
    width: 100%;
    height: auto;
    border: 2px solid black;
  }

  .col-12styled{
    background-color: rgba(128, 128, 128, 0.4);
    border-bottom: 2px solid black;
  }

  .col-12styled2{
    background-color: rgba(128, 128, 128, 0.4);
  }

  #footer_break{
    display: block;
  }
}
```

A ‘media query’ Mainly for Inbetween Standard Tablet and Desktop Sizes

```
@media only screen and (min-width: 768px){
  .instructions_section{
    text-align: center;
    padding: 5px;
  }

  .instructions_section a{
    width: 100%;
    margin: auto;
    height: auto;
    display: block;
    border-radius: 20%;
  }

  .instructions_section p{
    padding-top: 0px;
  }

  .test_image{
    display: block;
    width: 100%;
    height: 785px;
    margin: auto;
    border: 2px solid black;
  }

  .link_breaks{
    display: none;
  } /*Restyling on different screen sizes*/
}
```

The Outcome of the Web Pages

The Main 3D Loom Page

Welcome to the 3D Loom Page

On this page, you will be able to interact and view different parts of a loom in 3D.

Instructions of how to Operate this Page

To operate this page, you can click and drag the 3D model to rotate and pan around it and if you would like to view each part of the loom separately, simply select one of the buttons situated below and this will take you to another page where you can view this part in more detail as well as being able to interact with it through clicking and dragging the model to rotate and pan.

Tappet Barrel

Frame and Harness

Take-up Mechanism

Loose Reed

Picking

Knock-off Mechanism

Sley

Sley Board

Rocking Shaft

Breast Beam

Guard

Cloth Beam

Back Beam

Shafts and Gears

Motor and Guards

Starting Handle

Bearings

The Whitchurch Silk Mill footer will be placed here

An Example of an Individual Part of the Loom Page (All Pages had the Same Appearance)

Tappet Barrel

[Return to 3D Loom Page](#)

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas non magna odio. Mauris vel lorem sit amet nulla suscipit consectetur. Suspendisse vel justo vitae metus dictum pellentesque. Nullam bibendum ligula eu placerat auctor. Ut et convallis est, convallis luctus tellus. Donec nulla felis, ultricies at orci non, feugiat lacinia elit. Mauris et felis lorem. Mauris viverra, neque quis volutpat pretium, leo felis pretium mi, nec interdum arcu lacus ac ligula. Donec vulputate nec nisi ut eleifend. Maecenas id nulla vitae sem accumsan faucibus at at purus. Etiam lectus risus, sollicitudin at ex at, pulvinar sodales purus. Interdum et malesuada fames ac ante ipsum primis in faucibus.

The Whitchurch Silk Mill footer will be placed here

Testing the Web Pages at this Stage

Introduction/Overview

Whilst waiting to receive advice on the types of code to use in order to allow for a 3D object to appear on a web page, I uploaded what I currently had onto a server to allow for testing across multiple devices as well as ensuring that everything functioned as it should have done.

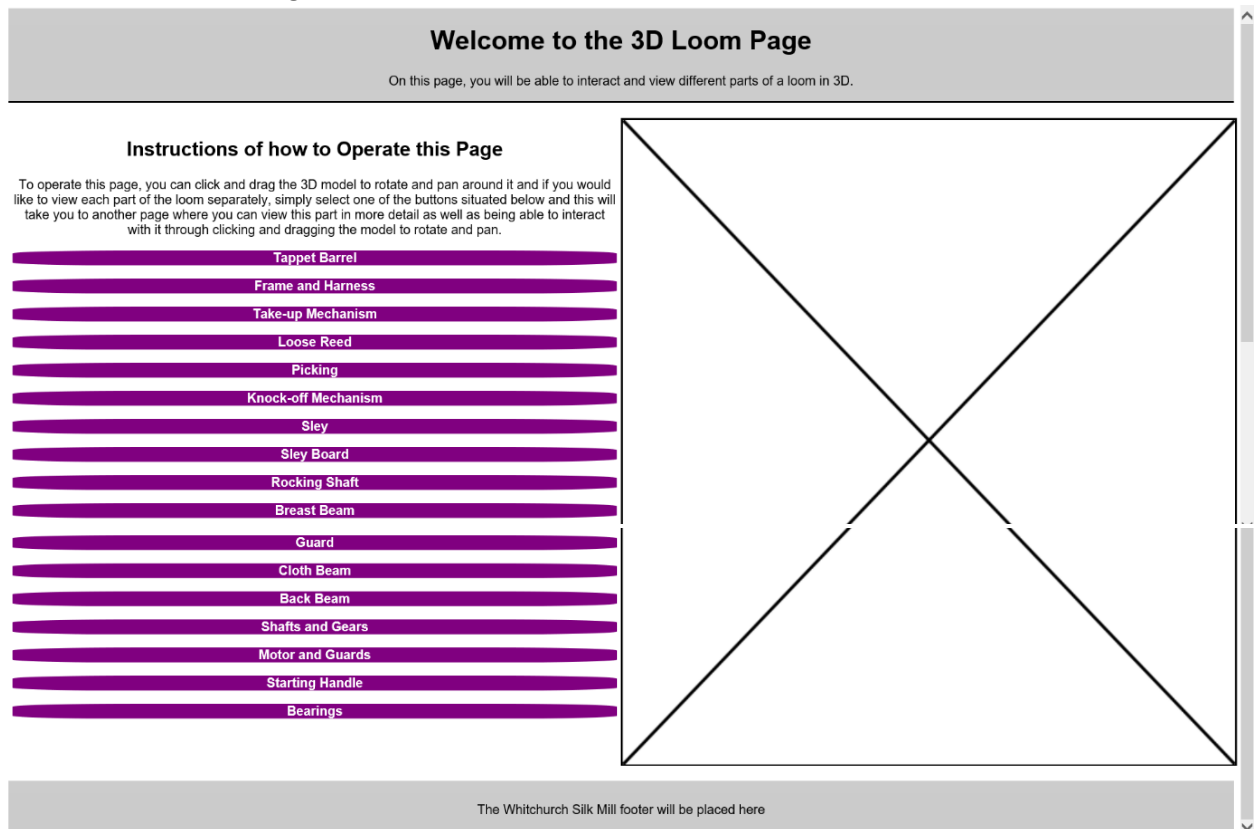
Desktop Testing

The Main 3D Loom Page

Introduction/Overview

As is evident below, everything appeared as it should have done on the web page without any issues. All of the elements were positioned how they should have been and the buttons to the separate web pages all worked.

The Outcome of the Testing



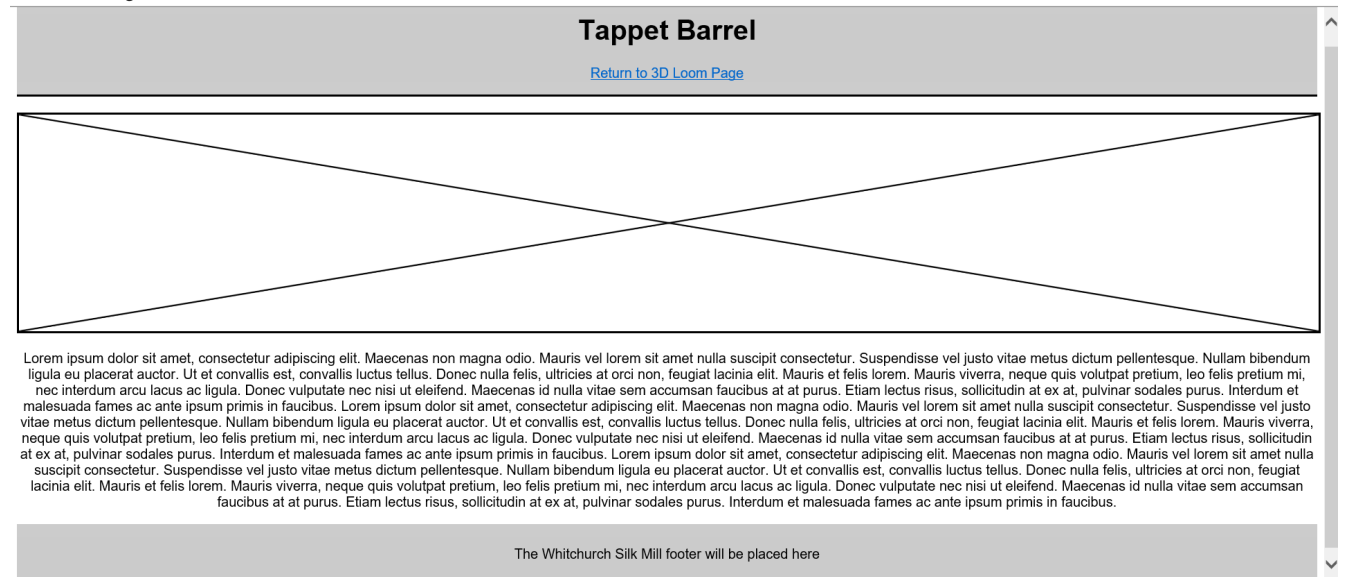
Individual Parts of the Loom Pages

Introduction/Overview

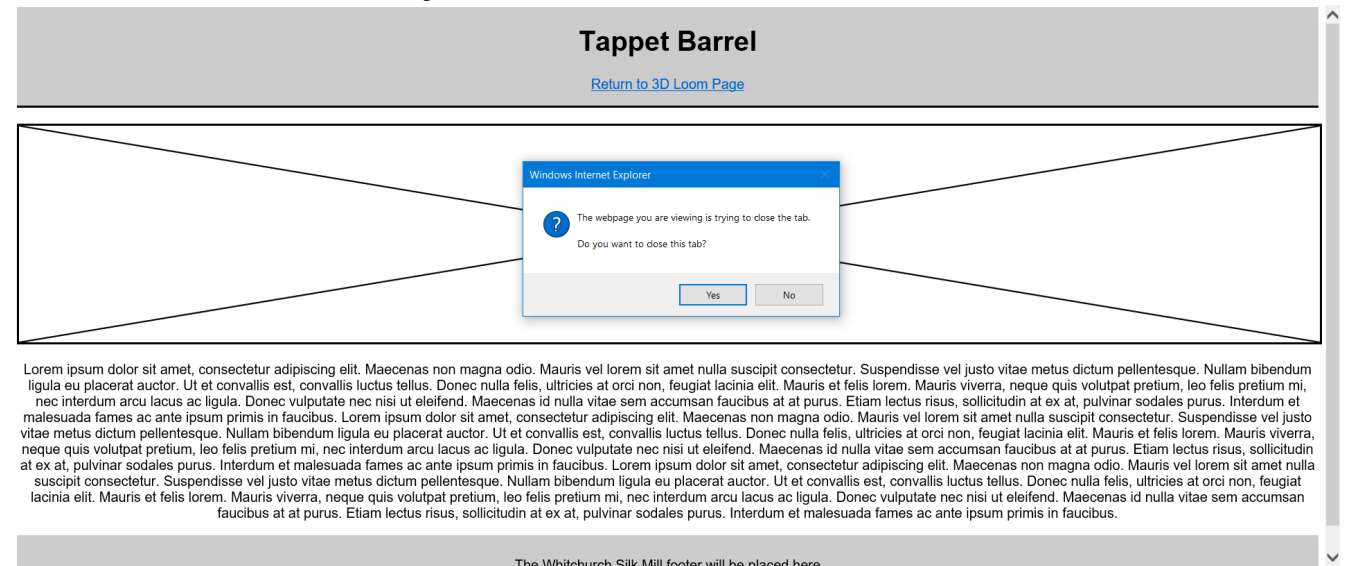
As is evident below, everything again appeared as it should have done without any issues. The link to return to the main 3D loom page also functioned properly.

The Outcome of the Testing

The Web Page in General



The Link to Return to the Main 3D Loom Page

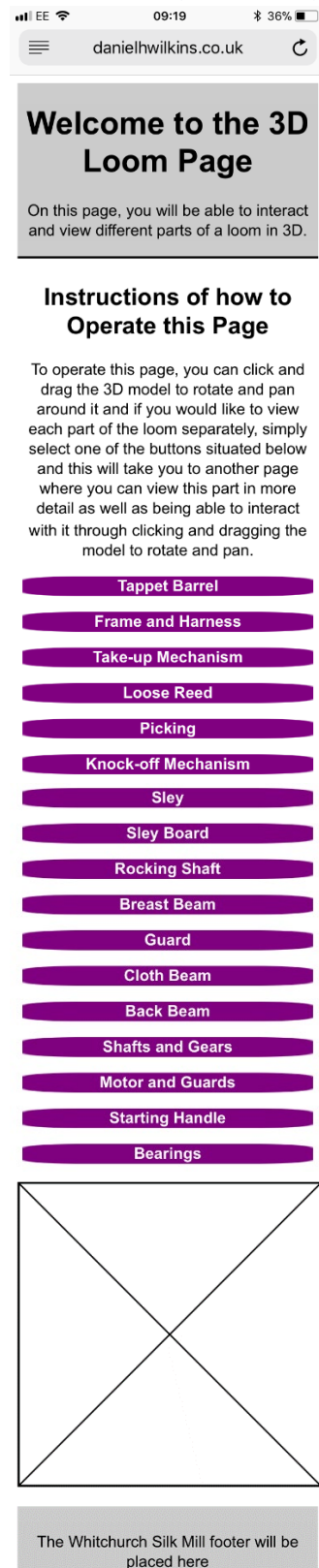


Smartphone/Mobile Device Testing

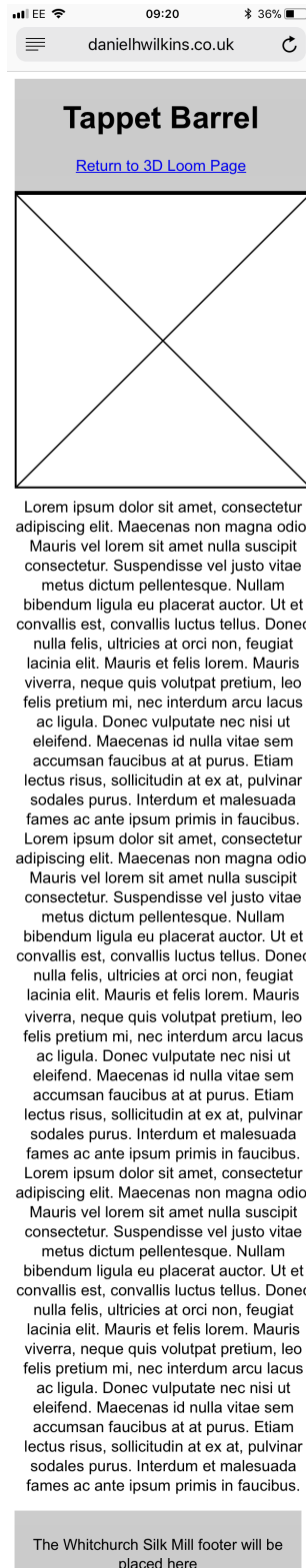
Introduction/Overview

As is evident below, the prototype appeared successfully on a mobile device.

The Outcome of the Testing



3D Loom Page (Portrait)



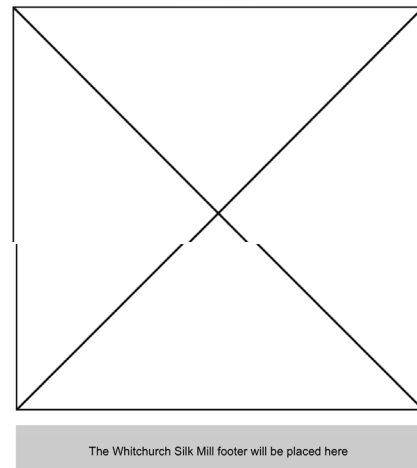
Individual Parts Page (Portrait)

Welcome to the 3D Loom Page

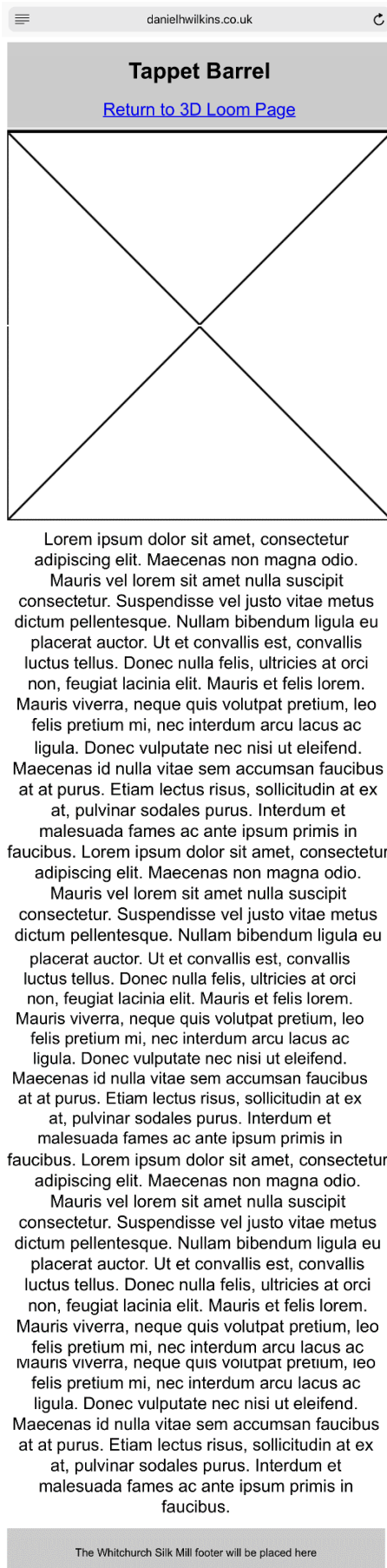
On this page, you will be able to interact and view different parts of a loom in 3D.

Instructions of how to Operate this Page

To operate this page, you can click and drag the 3D model to rotate and pan around it and if you would like to view each part of the loom separately, simply select one of the buttons situated below and this will take you to another page where you can view this part in more detail as well as being able to interact with it through clicking and dragging the model to rotate and pan.



3D Loom Page (Landscape)



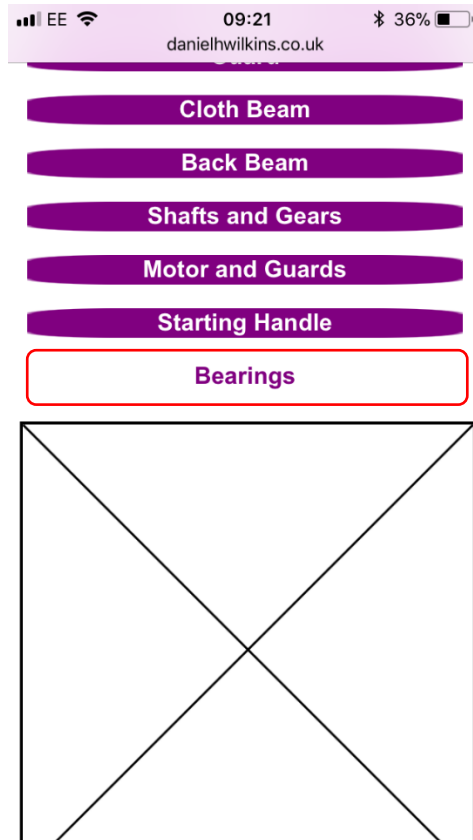
Individual Parts Page (Landscape)

An Issue Experienced

Introduction/Overview

There was, however, an issue after clicking on one of the links on the 3D loom page and then returning back to the 3D loom page. This was because the link that had been selected had stayed in the state as it would have done when being hovered over. It was something that didn’t affect anything but visually needed to be corrected if there was enough time. This is highlighted below.

The Actual Issue



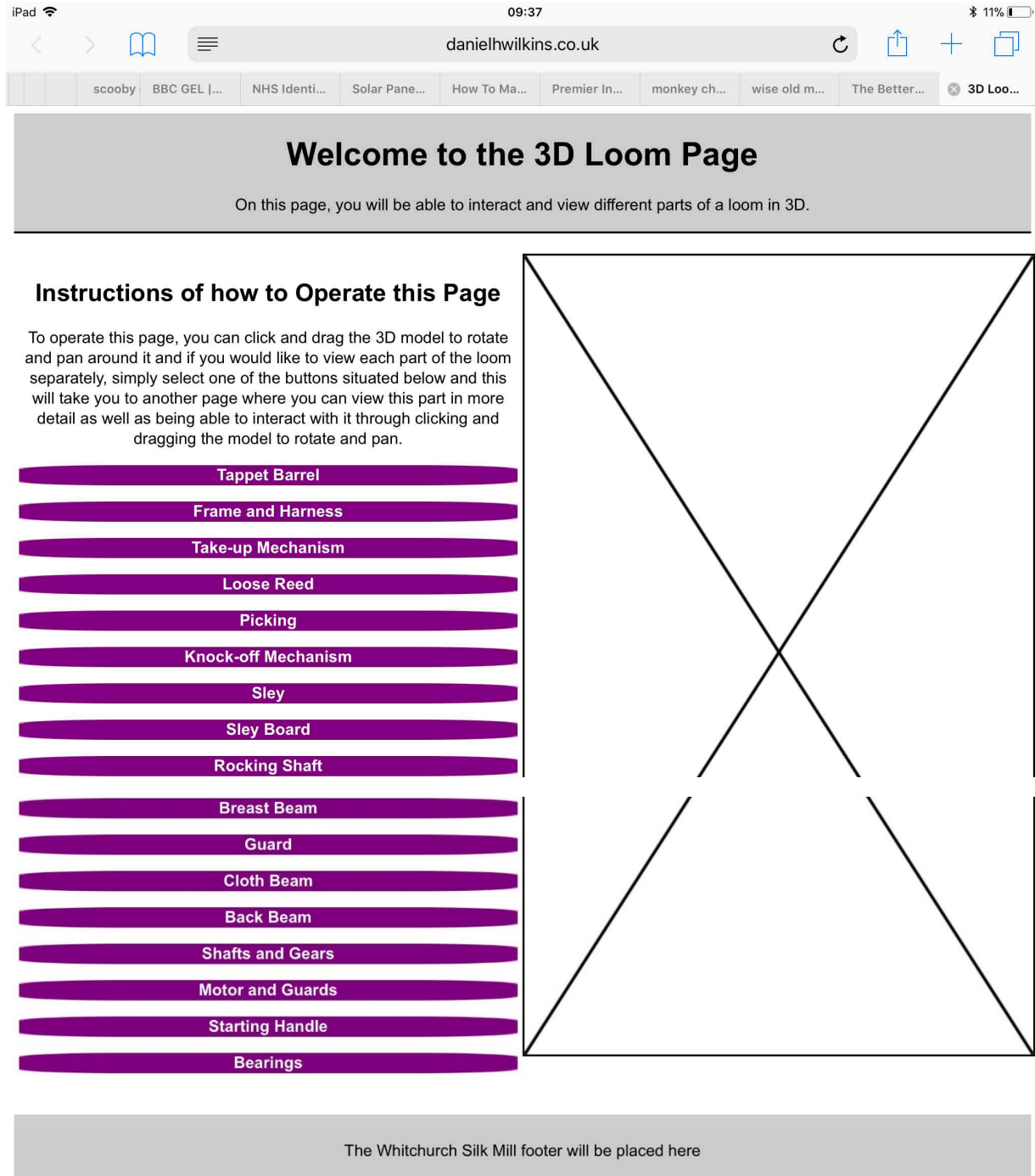
Tablet Device Testing

Introduction/Overview

As a tablet would have been used within the silk mill when welcoming visitors, this was something that was essential. The testing proved that the web page could have scaled and be positioned on different sized devices.

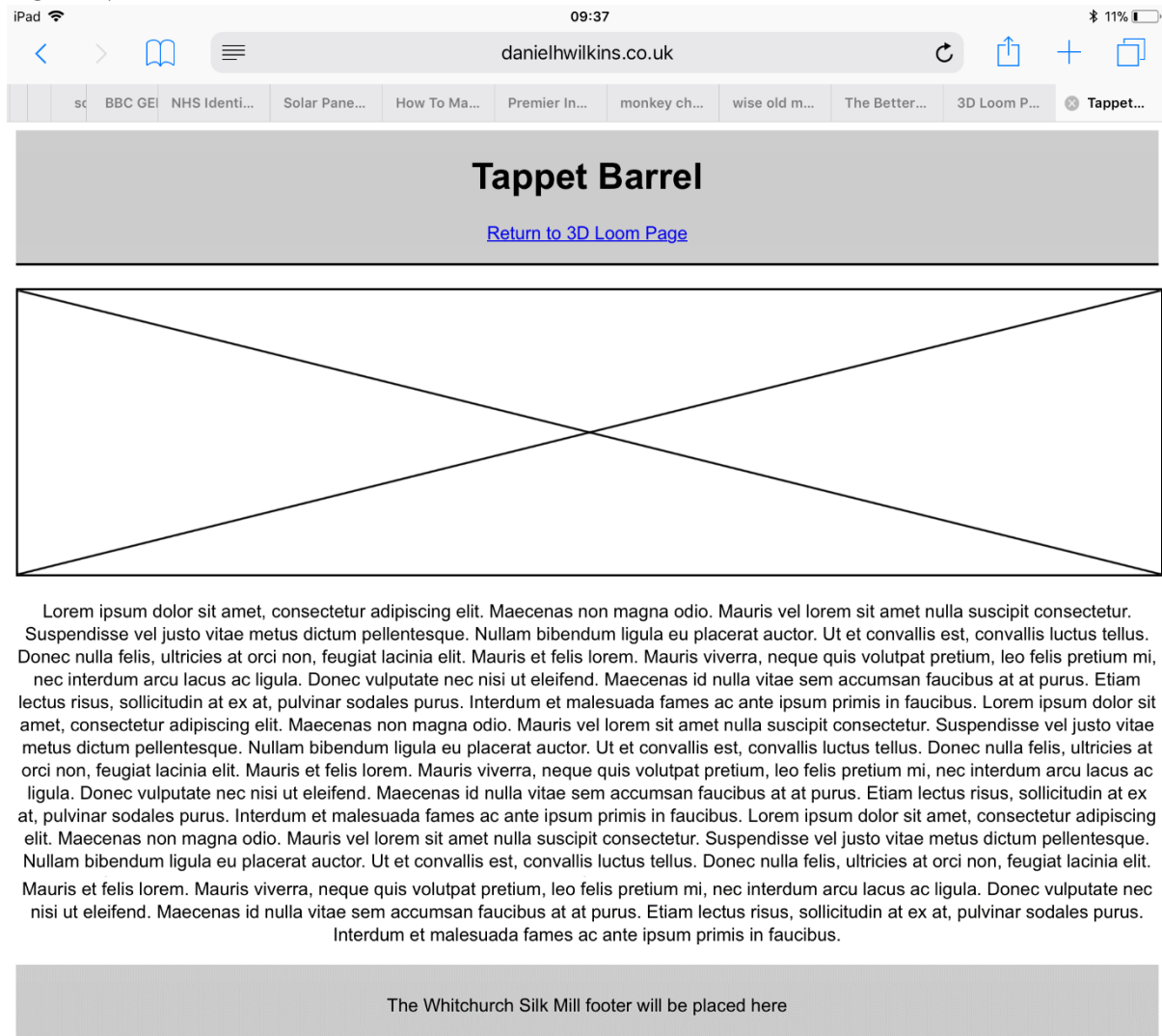
The Outcome of the Testing

The Landscape View of the Main 3D Loom Page

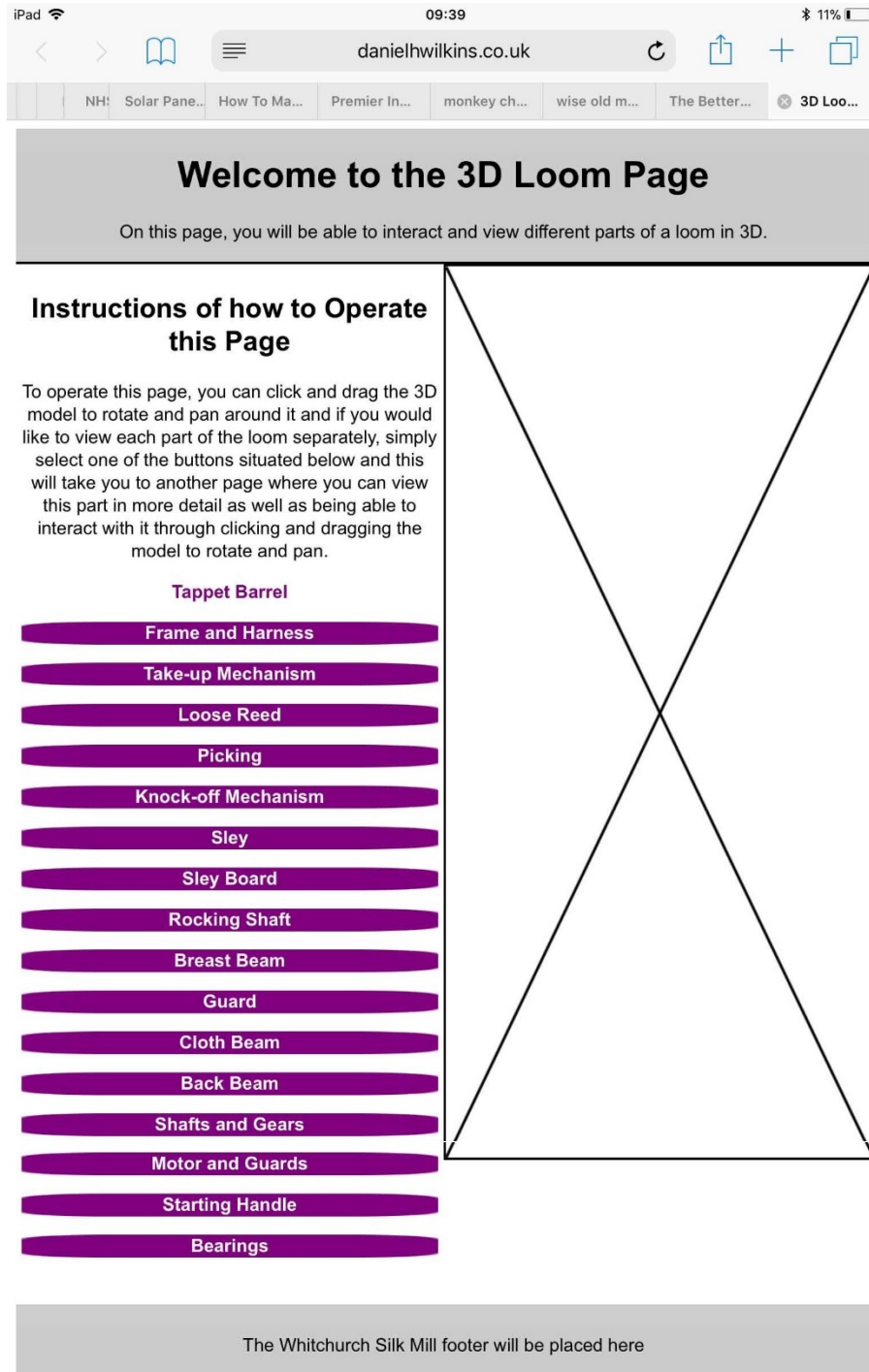


'Whitchurch Silk Mill' Project (Y2S2) Development Process Document – Daniel Wilkins

An Example of The Landscape View of the Individual Parts Web Page (Each Page was Identical Apart from the Page Title)

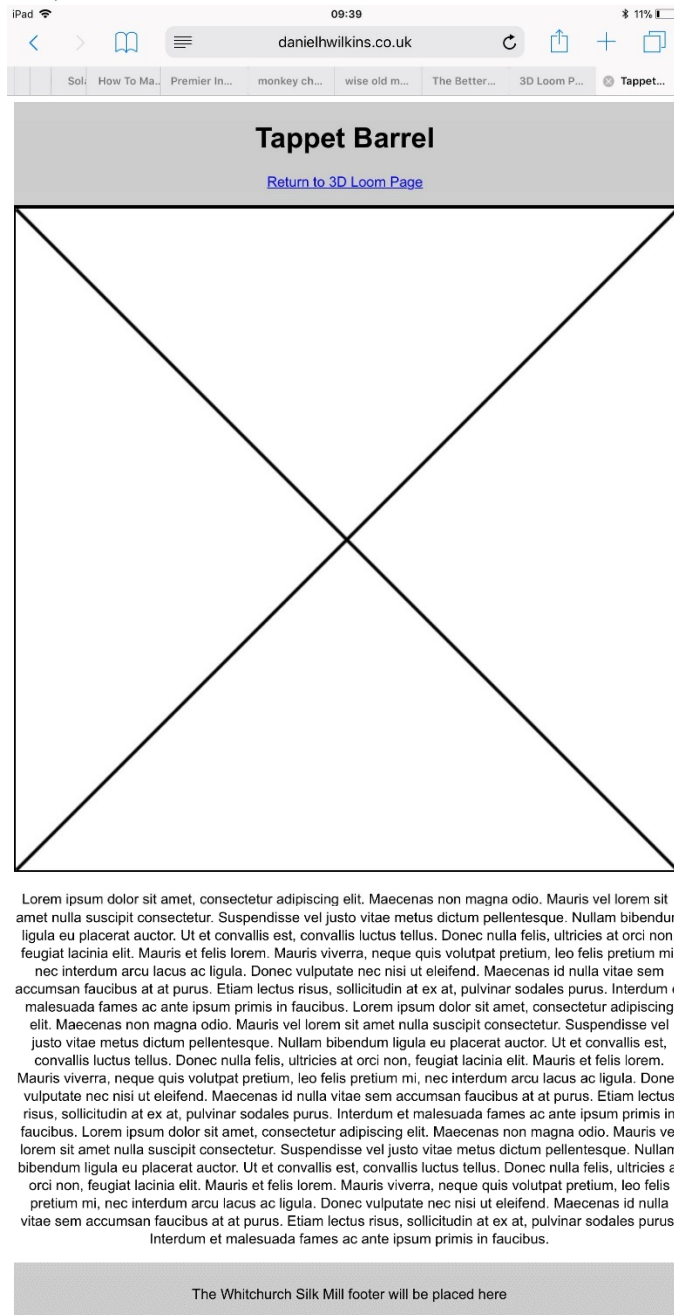


The Portrait View of the Main 3D Loom Page



'Whitchurch Silk Mill' Project (Y2S2) Development Process Document – Daniel Wilkins

An Example of The Portrait View of the Individual Parts Web Page (Each Page was Identical Apart from the Page Title)



An Issue Experienced

Introduction/Overview

Again, the same issue appeared as on a mobile device where the selected link would have appeared as if it had been hovered over with a mouse.

The Actual Issue

Tappet Barrel

Frame and Harness

Implementing Feedback from a Critique Session

Introduction/Overview

In one of the lectures, we had to demonstrate our progress of the projects so far and the feedback received was to completely re-design the web pages as they weren't very appealing. This was a job for one of the designers to produce the designs and for myself to implement them into a later version of the web pages. It was also suggested to perhaps use a series of 'png' files to make a video that showed the loom animating and implementing this into the web page. The lecturer mentioned that he would have helped myself to implement an actual 3D model onto a web page. In the meantime, I decided to contact the designer and ask what parts of the loom they were focusing on for the 3D model so that I could have focused on placing the actual content onto the current web pages.

I then realised that the designer may have been building a 3D model of a generic loom rather than a loom which referred to 'Whitchurch Silk Mill' as the link to an article on 'LinkedIn' that I shared earlier on in the project to help with understanding had been used. I therefore emailed the client to make them aware of the situation but to also to ask if they would mind myself undertaking some research on these parts of the loom on the Internet and including this, if referenced, as a document they had previously sent to help explained about the condition of specific parts of the loom rather than the purpose and function of these parts. The client then responded with an e-mail, attaching the necessary files to help with this information. Later on, I realised that the designer may have used the article to help but also used documentation provided by the client of which represented one of the looms at 'Whitchurch Silk Mill'.

Contacting the Designer

The Question Sent to the Designer

do you know what parts of the loom you are doing like what are they called just so I know what to put on the web page? Thanks.

Response 1 and 2

1

getting there ... the parts of the loom i have focused on include: the warp beam, shaft/harness, heddles, shuttle, reed and take up roll - i believe this is what i am covering.. but if you feel there is anything else we should include then let me know

2

i have analysed this from both the document previously sent about the silkmill and a source from linkedin

<https://www.linkedin.com/pulse/20141030195455-49457671-understanding-weaving-what-are-loom/>

hope this is okay

www.linkedin.com
linkedin.com

The Fifth Prototype of the Web Page(s)

Gaining Help from the Lecturer

Introduction/Overview

After I had obtained the necessary information, I then continued with the development process as I had now gained some help from the lecturer about what the issue was with regards to the 'obj' loader on the web page.

After receiving some help, I then realised that if I looked at the example file within the files I had downloaded, I could have then used this and altered the code to implement the 3D models the group would be creating. This then displayed the example model on the web page without any issues, something I had found difficult to do previously.

The Received Advice After it was Suggested to Send the Files as a 'zip' for the Lecturer to View

Hi Sam, just wondering if you managed to have a look at the files I sent?

hi dan i did, have you got the example on git hub working?

they have an example, try to run that and we will take it from there

An Example of how the Outcome Should Have Appeared



Viewing the Example Provided

The ‘HTML’, ‘CSS’ and ‘JavaScript’ code of the Example File

```
webgl_loader_obj.html x
1  <!DOCTYPE html>
2  <html lang="en">
3    <head>
4      <title>three.js webgl - loaders - OBJ loader</title>
5      <meta charset="utf-8">
6      <meta name="viewport" content="width=device-width, user-scalable=no, minimum-scale=1.0, maximum-scale=1.0">
7      <style>
8        body {
9          font-family: Monospace;
10         background-color: #000;
11         color: #fff;
12         margin: 0px;
13         overflow: hidden;
14       }
15       #info {
16         color: #fff;
17         position: absolute;
18         top: 10px;
19         width: 100%;
20         text-align: center;
21         z-index: 100;
22         display: block;
23       }
24       #info a, .button { color: #f00; font-weight: bold; text-decoration: underline; cursor: pointer }
25     </style>
26   </head>
27   <body>
28     <div id="info">
29       <a href="http://threejs.org" target="_blank" rel="noopener">three.js</a> - OBJLoader test
30     </div>
31     <script src="../build/three.js"></script>
32     <script src="js/loaders/OBJLoader.js"></script>
33     <script>
34       var container;
35
36       var camera, scene, renderer;
37
38       var mouseX = 0, mouseY = 0;
39
40       var windowHalfX = window.innerWidth / 2;
41       var windowHalfY = window.innerHeight / 2;
42
43       init();
44       animate();
45
46     </script>
47
48     function init() {
49
50       container = document.createElement( 'div' );
51       document.body.appendChild( container );
52
53       camera = new THREE.PerspectiveCamera( 45, window.innerWidth / window.innerHeight, 1, 2000 );
54       camera.position.z = 250;
55
56       // scene
57
58       scene = new THREE.Scene();
59
60       var ambientLight = new THREE.AmbientLight( 0xffffff, 0.4 );
61       scene.add( ambientLight );
62
63       var pointLight = new THREE.PointLight( 0xffffff, 0.8 );
64       camera.add( pointLight );
65       scene.add( camera );
66
67       // texture
68
69       var manager = new THREE.LoadingManager();
70       manager.onProgress = function ( item, loaded, total ) {
71         console.log( item, loaded, total );
72       };
73
74       var textureLoader = new THREE.TextureLoader( manager );
75       var texture = textureLoader.load( 'textures/UV_Grid_Sm.jpg' );
76
77       // model
78
79       var onProgress = function ( xhr ) {
80         if ( xhr.lengthComputable ) {
81           var percentComplete = xhr.loaded / xhr.total * 100;
82           console.log( Math.round(percentComplete, 2) + '% downloaded' );
83         }
84       };
85
86       var onError = function ( xhr ) {
87       };
88
89       var loader = new THREE.OBJLoader( manager );
90       loader.load( 'models/obj/male02/male02.obj', function ( object ) {
91
92         object.traverse( function ( child ) {
93
94           if ( child instanceof THREE.Mesh ) {
95             child.material.map = texture;
96           }
97         } );
98
99       } );
100
101     }
102
103   </body>
104 </html>
```

```
108         object.position.y = - 95;
109         scene.add( object );
110
111     }, onProgress, onError );
112
113     //
114
115     renderer = new THREE.WebGLRenderer();
116     renderer.setPixelRatio( window.devicePixelRatio );
117     renderer.setSize( window.innerWidth, window.innerHeight );
118     container.appendChild( renderer.domElement );
119
120     document.addEventListener( 'mousemove', onDocumentMouseMove, false );
121
122     //
123
124     window.addEventListener( 'resize', onWindowResize, false );
125
126 }
127
128 function onWindowResize() {
129
130     windowHalfX = window.innerWidth / 2;
131     windowHalfY = window.innerHeight / 2;
132
133     camera.aspect = window.innerWidth / window.innerHeight;
134     camera.updateProjectionMatrix();
135
136     renderer.setSize( window.innerWidth, window.innerHeight );
137
138 }
139
140 function onDocumentMouseMove( event ) {
141
142     mouseX = ( event.clientX - windowHalfX ) / 2;
143     mouseY = ( event.clientY - windowHalfY ) / 2;
144
145 }
146
147 //
148
149 function animate() {
150
151     requestAnimationFrame( animate );
152     render();
153
154 }
155
156 function render() {
157
158     camera.position.x += ( mouseX - camera.position.x ) * .05;
159     camera.position.y += ( - mouseY - camera.position.y ) * .05;
160
161     camera.lookAt( scene.position );
162
163     renderer.render( scene, camera );
164
165 }
166
167 </script>
168
169 </body>
170 </html>
171
```

Making Changes to the Example File as Suggested

Introduction/Overview

After obtaining the code file for the example model, I then started to alter the code to suit the 3D loom project.

I first of all changed the camera which changed the size of the scene to a small size rather than covering the whole screen. I also changed the 'camera.position.z' to 10 which I believe changed the distance that the cube was placed from the scene once the web page had loaded. This was done through the assistance of a few sources.

I also undertook some research and from a source I added in and changed the background colour of the scene through the code below to red. From communicating with the other developer in the group, I understood that the part after '0x' was a 'HEX' code which related to the colour as it would have done in a 'CSS' file.

The important aspect was implementing a cube I had created using 'Blender'. This was done through following a tutorial earlier on in the project when attempting to make the 'obj' loader work. From this, I understood I needed to export the textures/materials as a 'png' file and export the model as an 'obj' file. These were then placed into folders of this prototype I was working on.

The final piece of code I changed was the 'object.position.y' and the renderer size. Changing the object position to 0 meant that the cube would have been placed in the centre of the renderer rather than appearing higher up. Also, changing the renderer size altered the size of the container the cube would have appeared in.

The Altered Code

Changing the Camera

```
function init() {  
  
    container = document.createElement( 'div' );  
    document.body.appendChild( container );  
  
    camera = new THREE.PerspectiveCamera( 50, 200/200, 1, 1000 );  
    camera.position.z = 10;
```

Changing the Background Colour of the Scene to Red

```
scene = new THREE.Scene();  
scene.background = new THREE.Color( 0xff0000 );
```


Implementing an Already Created Cube in ‘Blender’

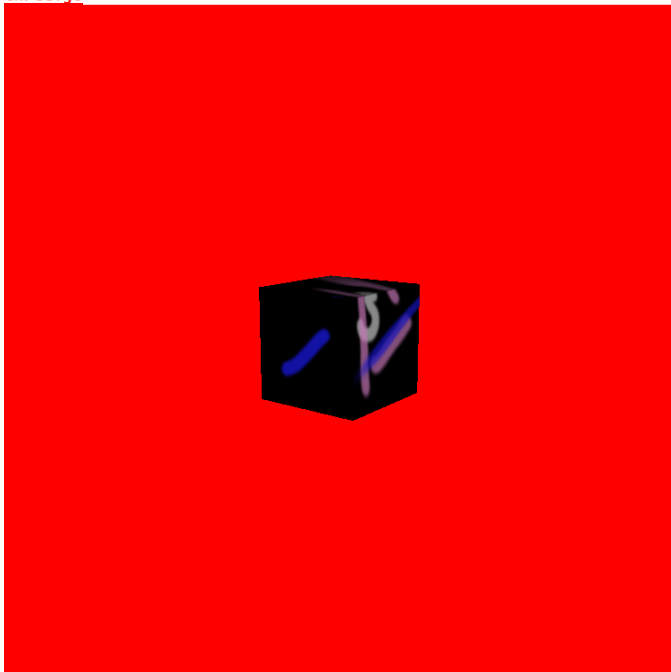
```
var textureLoader = new THREE.TextureLoader( manager );  
var texture = textureLoader.load( 'textures/modeltest.png' );  
  
// model  
  
var onProgress = function ( xhr ) {  
  if ( xhr.lengthComputable ) {  
    var percentComplete = xhr.loaded / xhr.total * 100;  
    console.log( Math.round(percentComplete, 2) + '% downloaded' );  
  }  
};  
  
var onError = function ( xhr ) {  
};  
  
var loader = new THREE.OBJLoader( manager );  
loader.load( 'models/obj/male02/modeltest.obj', function ( object ) {  
  
  object.traverse( function ( child ) {  
    if ( child instanceof THREE.Mesh ) {  
      child.material.map = texture;  
    }  
  }  
});
```

Changing the Object Position and Renderer Size

```
object.position.y = 0;  
scene.add( object );  
  
}, onProgress, onError );  
  
//  
  
renderer = new THREE.WebGLRenderer();  
renderer.setPixelRatio( window.devicePixelRatio );  
renderer.setSize(600, 600); //https://stackoverflow.  
com/questions/12583528/positioning-the-three-js-cont  
container.appendChild( renderer.domElement );
```

The Outcome at this Stage

three.js



The Sixth Prototype of the Web Page(s)

Introduction/Overview

Within this prototype, I began to experiment further as at the current stage, moving the mouse would have caused the object to move but I wanted to change this so interaction such as mouse clicks would have moved the object instead. I also attempted to place the integrated 3D model next to the content on a web page.

The Existing Mouse Movement Effect

```
renderer = new THREE.WebGLRenderer();
renderer.setPixelRatio( window.devicePixelRatio );
renderer.setSize(600, 600); //https://stackoverflow.com/questions/19827
com/questions/12583528/positioning-the-three-js-container-as-an-html-di
container.appendChild( renderer.domElement );

document.addEventListener( 'mousemove', onDocumentMouseMove, false );

//

window.addEventListener( 'resize', onWindowResize, false );

}
```

```
function onDocumentMouseMove( event ) {

    mouseX = ( event.clientX - windowHalfX ) / 2;
    mouseY = ( event.clientY - windowHalfY ) / 2;

}

//

function animate() {

    requestAnimationFrame( animate );
    render();

}

function render() {

    camera.position.x += ( mouseX - camera.position.x ) * .05;
    camera.position.y += ( - mouseY - camera.position.y ) * .05;

    camera.lookAt( scene.position );

    renderer.render( scene, camera );

}
```

Allowing for Model Movement by User Interactions Instead

The 'TrackballControls.js' File

Introduction/Overview

After undertaking some research, I understood that there was another file included in the 'three.js' download I had downloaded. This file was called 'TrackballControls.js' and this needed to link to the file where the 3D model would have been called. From following a tutorial, I added code to that file.

I then also added code to the provided 'init' function as well as adding 'controls.update();' to the animate function. As well as this, I removed the code shown before relating to the mouse movement so that this wouldn't have affected the performance of the controls. This then allowed for controlling of the cube on the web page.

Adding Code to Allow for the 'TrackballControls.js' File to Function

Adding a Source to Link to the File Externally and Adding a 'controls' Variable

```
<!DOCTYPE html>
<html>
<head>
  <title>3d Loom Model</title>
</head>
<body>
  <script src="three.js"></script>
  <script src="OBJLoader.js"></script>
  <script src="TrackballControls.js"></script> <!--https://www.youtube.com/watch?v=
</script>
  var container;

  var camera, controls, scene, renderer;
  //var divtest = document.getElementById("js_div2");
  //var CANVAS_WIDTH = 600;
  //var CANVAS_HEIGHT = 600; //https://codepen.io/tjuro/pen/mmYKyK

  //var mouseX = 20, mouseY = 20;

  //var windowHalfX = window.innerWidth / 2;
  //var windowHalfY = window.innerHeight / 2;

  init();
  animate();
```

Adding Further Code to the Provided 'init' Function

```
//Trackball Controls

controls = new THREE.TrackballControls( camera );
controls.addEventListener('change', render);
}
```

Adding 'controls.update();' to the 'animate' Function

```
function animate() {

  requestAnimationFrame( animate );
  render();
  controls.update();
}
```

Placing the Integrated 3D Model Inline with the Other Content

My Attempt

Introduction/Overview

I attempted to make the renderer/scene appear alongside content the web page I was currently developing. However, likewise to the animating green cube nearer to the start of the project, it was forced onto the next line. I utilised many examples of code found online to try and fix the problem including the example below. However, they didn't solve the problem.

An Example of a Piece of Code Utilised to Attempt to Help Solve the Issue

```
var container;  
  
var camera, controls, scene, renderer;  
var divtest = document.getElementById("js_div2");  
var CANVAS_WIDTH = 600;  
var CANVAS_HEIGHT = 600; //https://codepen.io/tjuro/pen/mmYKyK  
  
//var mouseX = 20, mouseY = 20;  
  
//var windowHalfX = window.innerWidth / 2;  
//var windowHalfY = window.innerHeight / 2;  
  
init();  
animate();  
  
function init() {  
  
    var container = document.createElement( 'div' ); //https://s  
    //https://stackoverflow.com/questions/40187942/three-js-how-  
    US/docs/Web/API/Document/createElement REFERENCE  
    container.setAttribute('class', 'col-12');  
    document.body.appendChild( container );  
}
```





The Other Developer's Idea

Introduction/Overview

After discussing with the other developer, it was suggested to me to place the interactive cube in an 'iframe' which would have allowed the web page I was working on to link to the page the interactive cube would have been placed on. This would have allowed the cube to be placed inline with the content. With the help of the other developer and 'W3Schools', I added this in and this successfully worked.

The Added/Integrated Code

Creating the File to Add the Code Into

Name	Date modified	Type	Size
 3d_model.html	16/03/2018 21:29	HTML File	5 KB
 OBJLoader.js	17/02/2018 16:31	JavaScript File	19 KB
 three.js	17/02/2018 16:31	JavaScript File	1,047 KB
 TrackballControls.js	12/03/2018 14:25	JavaScript File	14 KB

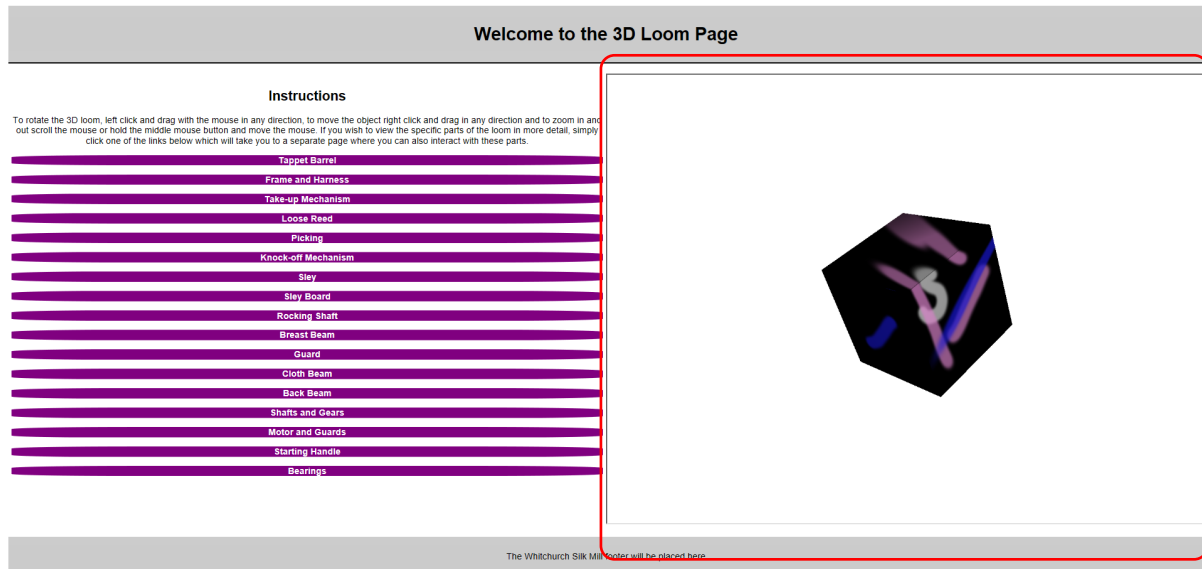
Adding an 'iframe' to the 'HTML' Code

```
<div class="col-6">  
  <iframe src="js/3d_model.html" id="home_iframe" scrolling="no">  
    <p>Your browser does not support iframes.</p>  
  </iframe>  
</div>
```

Styling the 'iframe' in the 'CSS' File

```
#home_iframe{  
  width: 100%;  
  height: 793px;  
}
```

The Outcome on the Web Page (This Worked)



Resolving Issues with the 'TrackballControls.js' File/Changing Settings

Introduction/Overview

I noticed before implementing the 'iframe' that when trying to get the object to appear on the page, as soon as I interacted with the page, in this situation scrolling and clicking and dragging, I noticed that the cube would respond with regards to the type of interaction. For example, I couldn't scroll down the page due to the fact that the cube was zooming in and out. To fix this at the time I changed the code in the 'TrackballControls.js' which can be seen below. This was through understanding from research.

As I had forgotten to mention how to change the speed of different interactions previously, the first piece of highlighted code below is where this would be changed. I changed the rotation speed as it was quite slow. With regards to the problem stated above, I changed the 'this.noZoom = false' to 'this.noZoom = true'. However, this was then changed back due to implementing the 'iframe'.

The Changed Aspects of the Code

```
this.enabled = true;

this.screen = { left: 0, top: 0, width: 0, height: 0 };

this.rotateSpeed = 10.0;
this.zoomSpeed = 1.2;
this.panSpeed = 0.3;

this.noRotate = false;
this.noZoom = false; //https://gist.github.com/heisters/
//https://github.com/mrdoob/three.js/blob/master/example
//https://threejs.org/docs/#examples/controls/OrbitContr
this.noPan = false;

this.staticMoving = false;
this.dynamicDampingFactor = 0.2;

this.minDistance = 0;
this.maxDistance = Infinity;

this.keys = [ 65 /*A*/, 83 /*S*/, 68 /*D*/ ];
```


The Seventh Prototype of the Web Page(s)

Introduction/Overview

After having understood and starting to implement the 'three.js' into the web page, I then changed the style to match that of what the designers had provided. Although it didn't fully represent the designs, it still improved the style of the previous prototype.

With regards to the home page, I styled it so that the buttons/links would have been bigger with a banner that was styled to suit the style of 'Whitchurch Silk Mill's' website. Also, the footer was changed to include examples of details which would have been included.

For the individual pages, I only styled one before moving on to the next prototype. I ensured that both the instructions and description/purpose of the individual part would have been included in one 'div' instead of two separate 'divs' as this was visually better.

The 3D Loom Home Page

The Code for this Page at this Stage

The 'HTML' Code

```
3d_loom_pg.html x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <title>3D Loom Page</title> <!--Looked at this - https://www.quora.com/What-is-a-good-way-to-put-ThreeJS-into-a-Div-->
5   <meta charset="utf-8">
6   <link rel="stylesheet" href="stylesheet.css">
7   <meta name="viewport" content="width=device-width, user-scalable=no, minimum-scale=1.0, maximum-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8 </head>
9 <!--https://threejs.org/docs/index.html#examples/loaders/OBJLoader REFERENCE-->
10 <!--https://stackoverflow.com/questions/48566845/three-js-mouse-events-with-raycasting-and-intersect-testing REFERENCE-->
11 <body>
12
13   <div class="row">
14     <div class="col-12styled">
15       <div class="banner">
16         <h1>WHITCHURCH SILK MILL LOOM</h1>
17         <hr class="heading_line">
18         <h2 class="font1_h2"><i>Interactive 3D Model</i></h2>
19         <!--<p>On this page, you will be able to interact and view different parts of a loom in 3D.</p-->
20       </div>
21     </div>
22   </div>
23   <br>
24
25   <div class="row">
26     <div class="col-6" id="js_div">
27       <div class="instructions_section">
28         <div class="white_box"><h2 class="font1_h2">Instructions</h2>
29         <p id="loom_home_p1">To rotate the 3D loom, left click and drag with the mouse in any direction, to move the object right click and drag in any direction and to zoom in and out scroll the mouse or hold the middle mouse button and move the mouse. If you wish to view the main different parts of the loom in more detail, simply click one of the links below which will take you to a separate page where you can also interact with these individual parts.</p>
30
31         <p id="loom_home_p2">To rotate the 3D loom, hold and swipe your finger in any direction, to move the object press and hold with two fingers whilst moving in any direction and use two fingers to either spread to zoom in or pinch to zoom out. If you wish to view the main different parts of the loom in more detail, simply tap one of the links below which will take you to a separate page where you can also interact with these individual parts.</p>
32         <br class="link_breaks"></div><br> <!--https://www.lipsum.com/feed/html - REFERENCE THIS-->
33
34         <a href="part1.html" target="_blank"><p class="linkp">WARP BEAM</p></a>
35         <a href="part2.html" target="_blank"><p class="linkp">SHAFT AND HARNESS</p></a> <!--<br class="link_breaks"><br class="link_breaks">-->
36         <a href="part3.html" target="_blank"><p class="linkp">REED(S)</p></a>
37         <a href="part4.html" target="_blank"><p class="linkp">SHEDDLES</p></a> <!--<br class="link_breaks"><br class="link_breaks">-->
38         <a href="part5.html" target="_blank"><p class="linkp">SHUTTLE</p></a>
39         <a href="part6.html" target="_blank"><p class="linkp">TAKE-UP MECHANISM</p></a> <!--<br class="link_breaks"><br class="link_breaks">-->
40         <!--Information for Prototyping - https://www.linkedin.com/pulse/28141030105455-49457671-understanding-weaving-what-are-ooms-->
41       </div> <!--Issue where I forgot to add div that meant the image was pushed onto another row - thought it was because I had added text center and div in-->
42     </div>
43
44     <div class="col-6">
45       <iframe src="js/3d_model.html" id="home_iframe" scrolling="no">
46         <p>Your browser does not support iframes.</p>
47       </iframe>
48     </div>
49     <!--<div id="js_div2"></div-->
50
51     <!--</div>-->
52     <!--<div class="col-6">
53       
54     </div>-->
55   </div>
56
57   <br id="footer_break">
58
59   <div class="row">
60     <div class="col-12styled2">
61       <div class="footer">
62         <p><img alt="Email icon" data-bbox="280 795 295 805"/> Email Address: example@talktalk.co.uk | Telephone: 01234 567 890 | Address: ____</p>
63       </div>
64     </div>
65   </div>
66
67 </body>
68
69 </html>
```


The Outcome of the Web Page



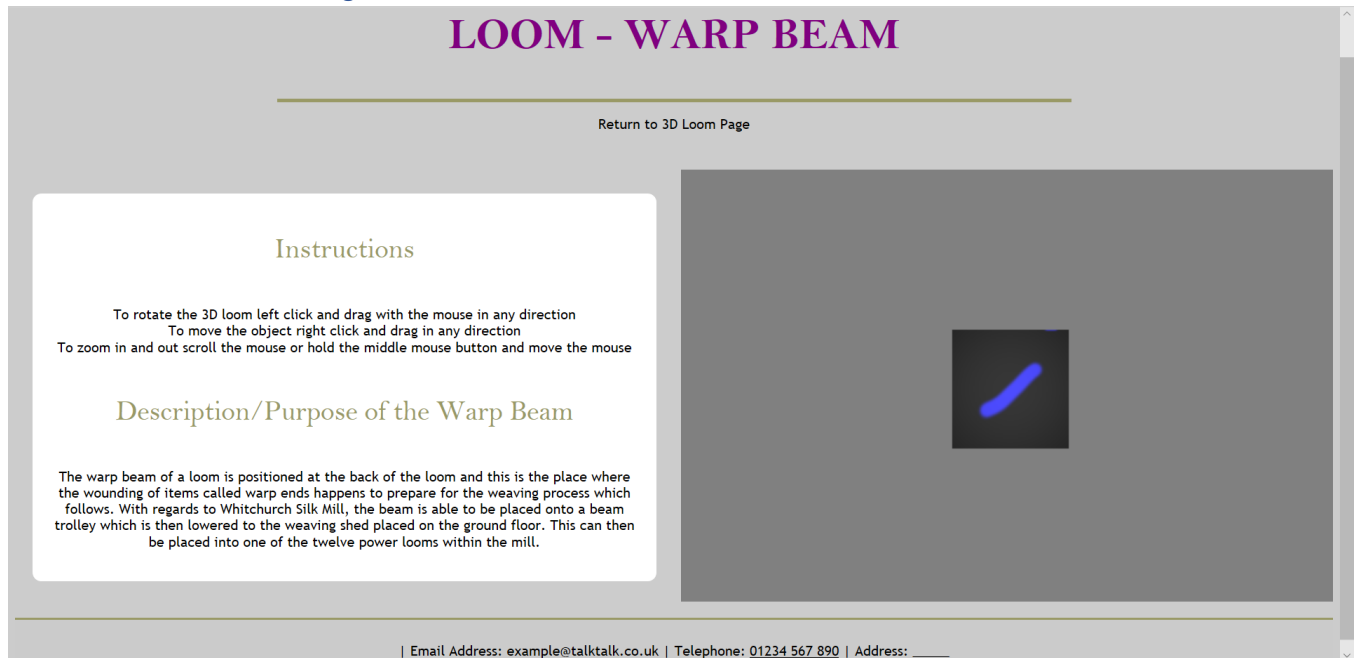
The Individual Part Page Example

The Code for this Page at this Stage

The ‘HTML’ Code

```
3d_loom_pg.html x part1.html x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <title>Warp Beam of the Loom</title>
5   <meta charset="utf-8">
6   <link rel="stylesheet" href="stylesheet.css">
7   <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8   <script src="js/three.js"></script>
9   <script src="js/OBJLoader.js"></script>
10  <script src="js/MTLLoader.js"></script>
11  <script src="js/OrbitControls.js"></script>
12
13 </head>
14
15 <body>
16   <div class="row">
17     <div class="col-12styled">
18       <div class="banner">
19         <h1>LOOM - WARP BEAM</h1>
20         <hr class="heading_line">
21         <a href="#" class="return_link" onclick="window.close();"><p>Return to 3D Loom Page</p></a> <!--https://stackoverflow.com/questions/2076299/how-to-close-current-tab-in-a-browser-
22         window - REFERENCE-->
23       </div>
24     </div>
25   </div>
26
27   <br>
28
29   <div class="row">
30     <div class="col-6">
31       <!--div class="white_box2">-->
32       <div class="instructions_box">
33         <h2 class="font1_h2">Instructions</h2>
34         <p>To rotate the 3D loom left click and drag with the mouse in any direction <br> To move the object right click and drag in any direction <br> To zoom in and out scroll the mouse
35         or hold the middle mouse button and move the mouse</p>
36         <!--div class="content_box">-->
37         <h2 class="font1_h2">Description/Purpose of the Warp Beam</h2>
38         <p>The warp beam of a loom is positioned at the back of the loom and this is the place where the wounding of items called warp ends happens to prepare for the weaving process
39         which follows. With regards to Whitchurch Silk Mill, the beam is able to be placed onto a beam trolley which is then lowered to the weaving shed placed on the ground floor. This
40         can then be placed into one of the twelve power looms within the mill.</p>
41         <!--https://www.linkedin.com/pulse/20141030195455-49457671-understanding-weaving-what-are-loom-->
42         <!--http://www.dictionary.com/browse/warp-beam-->
43         <!--div-->
44       </div>
45
46       <div class="instructions_box2">
47         <h2 class="font1_h2">Instructions</h2>
48         <p>To rotate the 3D loom swipe with your finger <br class="force_break"> To zoom in and out pinch and spread two fingers</p>
49         <!--br Didn't want to work properly so I assigned a class and displayed it as a block to force it to function properly-->
50         <!--div class="content_box2">-->
51         <h2 class="font1_h2">Description/Purpose of the Warp Beam</h2>
52         <p>The warp beam of the loom is a type of roller that is positioned at the back of the loom. This is the place where the wounding of items called warp ends happens to prepare for
53         the weaving process which follows. With regards to Whitchurch Silk Mill, the beam is able to be placed onto a beam trolley which is then lowered to the weaving shed placed on the
54         ground floor. This can then be placed into one of the twelve power looms within the mill.</p>
55         <!--div-->
56       </div>
57     </div>
58
59     <div class="col-6">
60       <iframe src="js/3d_model.html" class="individual_parts_iframe" scrolling="no"> <!--https://www.w3schools.com/tags/tag_iframe.asp - REFERENCE-->
61       <p>Your browser does not support iframes.</p>
62     </div>
63   </div>
64
65   <br>
66
67   <!--hr id="hr">-->
68
69   <div class="row">
70     <div class="col-12styled2">
71       <div class="footer">
72         <p>| Email Address: example@talktalk.co.uk | Telephone: 01234 567 890 | Address: ____</p>
73       </div>
74     </div>
75   </div>
76
77 </body>
78
79 </html>
```

The Outcome of the Web Page



Ensuring the Instructions Changed for Different Devices

Introduction/Overview

To make the instructions change for different devices, I added in the 'HTML' code highlighted previously for the individual part page example and changed the 'display' options so that only one set would have appeared when on a type of device. This can be viewed in the 'CSS' code where highlighted below.

The 'CSS' code for this prototype can also be seen below. This was changed to mostly reflect the designs of the designers.

The 'CSS' Code

```
3d_loom_pg.html x part1.html x stylesheet.css x
1 body{
2   background-color: rgba(128, 128, 128, 0.4);
3 }
4
5 h1{
6   font-family: Bell MT;
7   color: purple;
8   /*font-size: 3em; Caused font to spread over div*/
9   font-size: 50px; /*Also problem with font spreading over div*/
10 }
11
12 h2{
13   font-family: Arial;
14 }
15
16 .font1_h2{
17   font-family: Bell MT;
18   color: #999966;
19   font-weight: lighter;
20   font-size: 2em;
21 }
22
23 h3{
24   font-family: Arial;
25 }
26
27 p{
28   font-family: Trebuchet ms;
29 }
30
31 .heading_line{
32   width: 60%;
33   border: 2px solid #999966; /*https://www.w3schools.com/colors/colors_pi
34 }
35
36 .return_link{
37   color: black;
38   text-decoration: none;
39   transition: 0.5s;
40 }
41
42 .return_link:hover{
43   color: purple;
44   transition: 0.5s;
45 }
46
47 .force_break{
48   display: block;
49 }
50
51
52 .row::after { /*w3schools - REFERENCE*/
53   content: "";
54   clear: both;
55   display: table;
56 }
57
58 [class*="col-"] {
59   float: left;
60   /*padding: 15px;
61   /*border: 1px solid red; /*w3schools - REFERENCE*/
62 }
63
64 /*w3schools - REFERENCE DONE*/ /*These are the columns
65 /*FOR MOBILE SCREENS*/
66 [class*="col-"] {
67   width: 100%;
68 }
69
70 @media only screen and (min-width: 600px) {
71   /*FOR TABLETS*/
72   .col-m-1 {width: 8.33%;}
73   .col-m-2 {width: 16.66%;}
74   .col-m-3 {width: 25%;}
75   .col-m-4 {width: 33.33%;}
76   .col-m-5 {width: 41.66%;}
77   .col-m-6 {width: 50%;}
78   .col-m-7 {width: 58.33%;}
79   .col-m-8 {width: 66.66%;}
80   .col-m-9 {width: 75%;}
81   .col-m-10 {width: 83.33%;}
82   .col-m-11 {width: 91.66%;}
83   .col-m-12 {width: 100%;} /*w3schools - REFERENCE*/
84 }
85
86 @media only screen and (min-width: 768px) { /*THIS IS A
87   /*FOR DESKTOPS*/
88   .col-1 {width: 8.33%;}
89   .col-2 {width: 16.66%;}
90   .col-24 {width: 20%;}
91   .col-3 {width: 25%;}
92   .col-4 {width: 33.33%;}
93   .col-5 {width: 41.66%;}
94   .col-6 {width: 50%;}
95   .col-7 {width: 58.33%;}
96   .col-8 {width: 66.66%;}
97   .col-9 {width: 75%;}
98   .col-10 {width: 83.33%;}
99   .col-11 {width: 91.66%;}
100   .col-12 {width: 100%;} /*w3schools REFERENCE - https://
101   .col-12styled {width: 100%;}
102   .col-12styled2 {width: 100%;}
103 }
104
105 .banner{
106   /*background-color: rgba(128, 128, 128, 0.01);*/
107   text-align: center;
108   width: 100%;
109   height: auto;
110 }
```

'Whitchurch Silk Mill' Project (Y2S2) Development Process Document – Daniel Wilkins

```

112 .banner h1{
113   padding: 10px;
114 }
115
116 #hr{
117   width: 100%;
118 }
119
120 /*#js_div2{
121   width: 600px;
122   height: 600px;
123   background-color: red;
124 }*/
125
126 #home_iframe{
127   width: 100%;
128   height: 793px;
129   border: none;
130 }
131
132 .individual_parts_iframe{
133   width: 50%;
134   height: 500px;
135   display: block;
136   margin: auto;
137   border: none;
138 }
139
140 .navigation_bar{ /*Cherry Child
141   background-color: none;
142   overflow: hidden;
143   text-align: center;
144   padding-bottom: 0px;
145   padding-top: 0px;
146 }
147
148 #nav_bar_background{
149   background-color: white;
150 }
151
152 .navigation_bar a{
153   text-decoration: none;
154   color: black;
155   transition: 0.5s;
156   padding-left: 20px;
157   padding-right: 20px;
158   font-family: Arial;
159   font-weight: 500;
160 }
161
162 .navigation_bar a:hover{
163   color: green;
164   transition: 0.5s;
165   background-color: none;
166 }
167
168
169 .navigation_bar .icon{
170   display: none;
171 } /*Cherry Childcare end*/
172
173 .main_content{
174   background-color: red;
175   text-align: center;
176 }
177
178 .main_content2{
179   background-color: orange;
180   text-align: center;
181 }
182
183 .test_image{
184   display: block;
185   width: 100%;
186   height: auto;
187   margin: auto;
188   border: 2px solid black;
189 }
190
191 #test_button{
192   display: inline-block;
193   margin: auto;
194   background-color: none;
195   border: none;
196 }
197
198 .buttons {
199   width: 450px;
200   height: 50px;
201   cursor: pointer;
202   border: 1px solid red;
203 }
204
205 #part1{
206   width: 300px;
207   height: 50px;
208   cursor: pointer;
209 }
210
211 #part2{
212   width: 300px;
213   height: 50px;
214   cursor: pointer;
215 }
216
217 #part3{
218   width: 300px;
219   height: 50px;
220   cursor: pointer;
221 }
222
223 #part4{
224   width: 300px;
225   height: 50px;
226   cursor: pointer;
227 }
228
229 #part5{
230   width: 300px;
231   height: 50px;
232   cursor: pointer;
233 }
234
235 #part6{
236   width: 300px;
237   height: 50px;
238   cursor: pointer;
239 }
240
241 #part7{
242   width: 300px;
243   height: 50px;
244   cursor: pointer;
245 }
246
247 #part8{
248   width: 300px;
249   height: 50px;
250   cursor: pointer;
251 }
252
253 #part9{
254   width: 300px;
255   height: 50px;
256   cursor: pointer;
257 }
258
259 #part10{
260   width: 300px;
261   height: 50px;
262   cursor: pointer;
263 }
264
265 .instructions_section{
266   text-align: center;
267   padding: 30px;
268 }
269
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```



```

422 #footer_break{
423     display: block;
424 }
425
426 .individual_parts_iframe{
427     width: 100%;
428 }
429
430 .instructions_box{
431     display: none;
432 }
433
434 .instructions_box2{
435     display: block;
436     /*border: 1px solid black;*/
437     background-color: white;
438     padding: 10px;
439     border-radius: 10px;
440 }
441
442 .instructions_box2 h2{
443     text-align: center;
444     padding-top: 10px;
445 }
446
447 .instructions_box2 p{
448     text-align: center;
449     padding-left: 10px;
450     padding-right: 10px;
451 }
452
453 .content_box2{
454     display: block;
455     border: 1px solid black;
456     text-align: center;
457     padding: 10px;
458 }
459
460 .content_box2 h3{
461     color: red;
462 }
463
464 .content_box2{
465     display: block;
466 }
467
468 .content_box{
469     display: none;
470 }
471
472 #home_iframe{
473     height: 300px;
474 }
475
476 .individual_parts_iframe{
477     height: 300px;
478 }
479
480 #loom_home_p1{
481     display: none;
482 }
483
484 #loom_home_p2{
485     display: block;
486 }
487
488 }
489
490 @media only screen and (min-width: 600px) and (max-width: 768px) { /*
491 .instructions_section{
492     text-align: center;
493     padding: 5px;
494 }
495
496 .instructions_section a{
497     width: 100%;
498     border-radius: 10px;
499     height: auto;
500     display: block;
501     padding-top: 10px;
502 }
503
504 .instructions_section p{
505     padding-top: 0px;
506 }
507
508 /*br{
509     display: none;
510 }*/
511
512 .part_image {
513     width: 100%;
514     height: auto;
515     border: 2px solid black;
516 }
517
518 /*.col-12styled{
519     background-color: rgba(128, 128, 128, 0.4);
520     border-bottom: 2px solid black;
521 }*/
522
523 /*.col-12styled2{
524     background-color: rgba(128, 128, 128, 0.4);
525 }*/
526
527 #footer_break{
528     display: block;
529 }
530
531 .individual_parts_iframe{
532     width: 100%;
533 }
534
535 .instructions_box{
536     display: none;
537 }
538
539 .instructions_box2{
540     display: block;
541     display: block;
542     background-color: white;
543     padding: 10px;
544     border-radius: 10px;
545     /*border: 1px solid black;*/
546 }
547
548 .instructions_box2 h2{
549     text-align: center;
550     padding-top: 10px;
551 }
552
553 .instructions_box2 p{
554     text-align: center;
555     padding-left: 10px;
556     padding-right: 10px;
557 }
558
559 .content_box2{
560     display: block;
561     border: 1px solid black;
562     text-align: center;
563     padding: 10px;
564 }
565
566 .content_box2 h3{
567     color: red;
568 }
569
570 .content_box2{
571     display: block;
572 }
573
574 .content_box{
575     display: none;
576 }
577
578 .linkp{
579     height: 40px;
580 }
581
582 #loom_home_p1{
583     display: none;
584 }

```

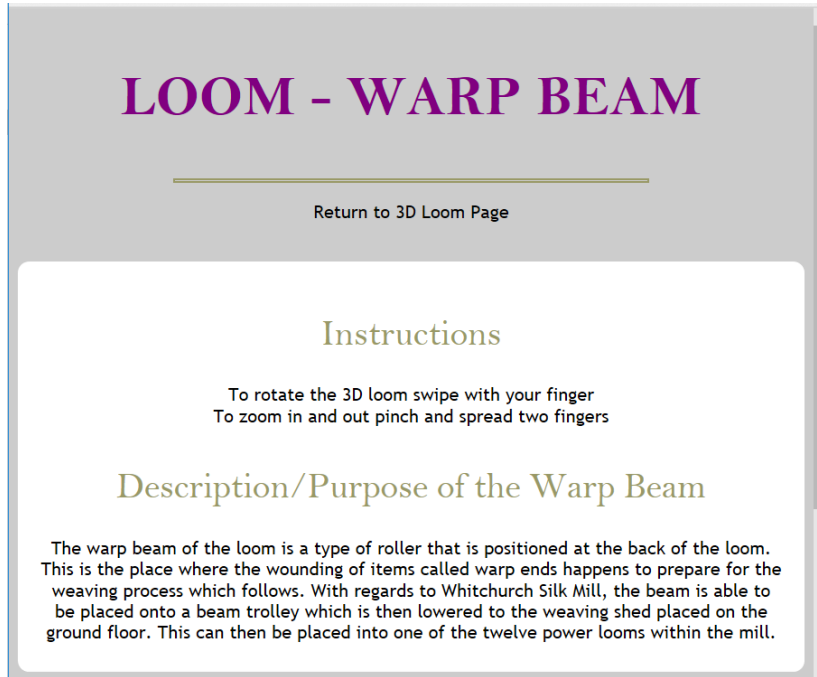
```

586 #loom_home_p2{
587     display: block;
588 }
589
590 }
591
592 @media only screen and (min-width: 768px){
593 .instructions_section{
594     text-align: center;
595     padding: 5px;
596 }
597
598 .instructions_section a{
599     width: 100%;
600     margin: auto;
601     height: auto;
602     display: block;
603     border-radius: 10px;
604     padding-top: 10px;
605 }
606
607 .instructions_section p{
608     padding-top: 0px;
609 }
610
611 .test_image{
612     display: block;
613     width: 100%;
614     height: 785px;
615     margin: auto;
616     border: 2px solid black;
617 }
618
619 .link_breaks{
620     display: none;
621 } /*Restyling on different screen sizes*/
622
623 .individual_parts_iframe{
624     width: 100%;
625 }
626
627 .linkp{
628     height: 40px;
629 }
630 }

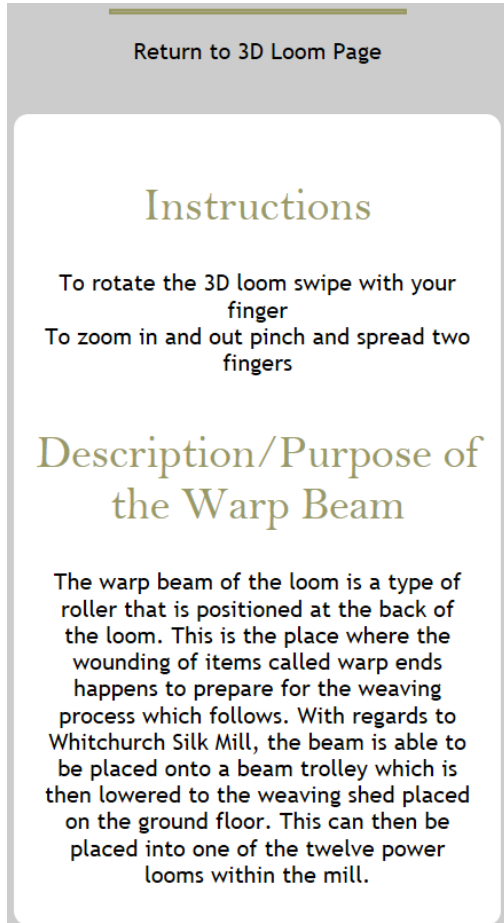
```

The Outcomes

The Outcome on a Tablet Device



The Outcome on a Smartphone/Mobile Device



The Eighth Prototype of the Web Page(s)

Introduction/Overview

After beginning to change the design, I then continued with this in the next prototype in ready for a critique session on 20th March. I made sure I had included the content I needed to with regards to each part as well as organising the files to send to the other developer in order for him to combine his work with mine. To send the files to the other developer, I added them to a ‘zip’ file.

I was advised by the other developer to include to buttons at the bottom of the page which he could have then linked to both the main page and the waterwheel page that he had created. This is highlighted below.

As will also be evident, the CSS code for all of the web pages has been included. Some of the code and styles were provided by the other developer such as the buttons highlighted.

The page for linking to the ‘iframes’ on the other pages has been included also.

As will be evident with some of the outcomes, I had used the information provided to myself in the documents that the client had sent. However, there was also some information found on the Internet as I didn’t have this information. From understanding, the other developer removed this information and replaced it with another part which meant that this wasn’t used. However, all references for any information used as well as the article from ‘LinkedIn’ to help with understanding has been included in the references/bibliography at the end of this section.

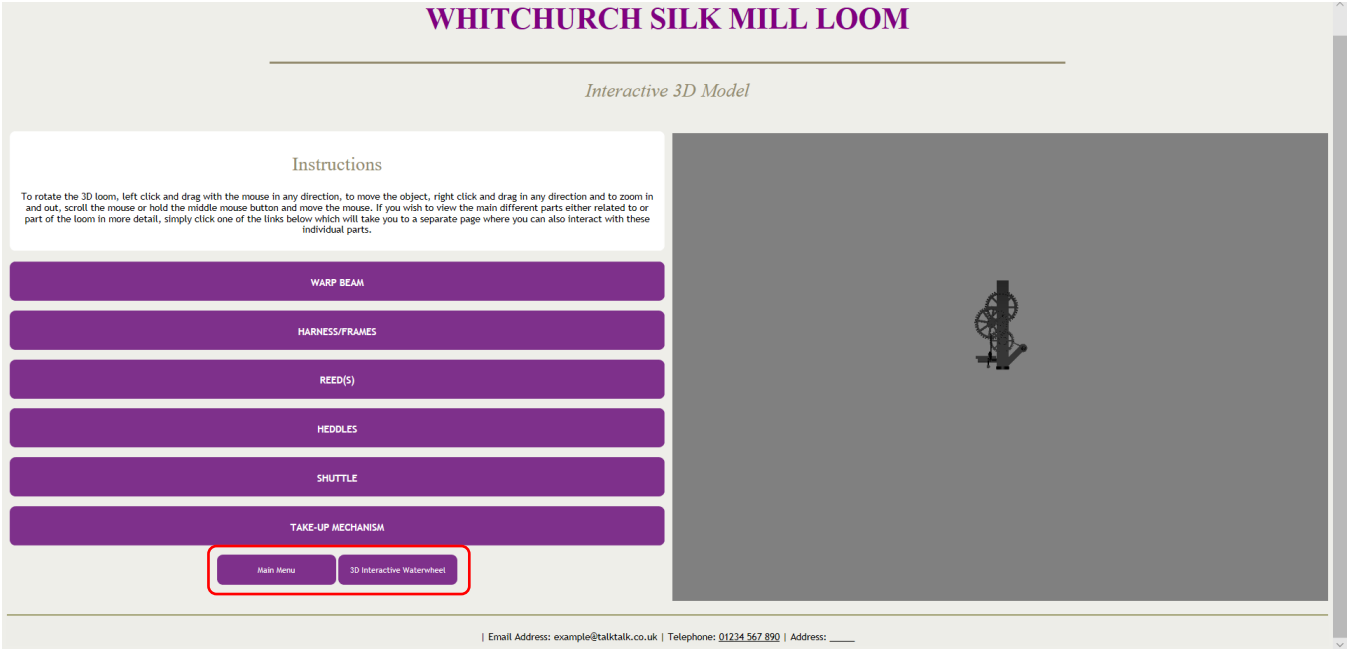
The 3D Loom Page

The Code for this Page at this Stage

The 'HTML' Code

```
dhwy2r2_pg.html x 3d_loom_pg.html x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4 <title>3D Loom Page</title> <!--Looked at this - https://www.quora.com/what-is-a-good-way-to-put-ThreeJS-into-a-Div-->
5 <meta charset="utf-8">
6 <link rel="stylesheet" href="styles/stylessheet.css">
7 <meta name="viewport" content="width=device-width, user-scalable=no, minimum-scale=1.0, maximum-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8 </head>
9 <!--https://threejs.org/docs/index.html#examples/loaders/OBJLoader REFERENCE-->
10 <!--https://stackoverflow.com/questions/40566045/three-js-mouse-events-with-raycasting-and-intersect-testing REFERENCE-->
11 <body>
12
13 <div class="row">
14 <div class="col-12styled">
15 <div class="banner">
16 <h1>WHITCHURCH SILK MILL LOOM</h1>
17 <hr class="heading_line">
18 <h2 class="font1_h2"><!--Interactive 3D Model</h2>
19 <!--<p>On this page, you will be able to interact and view different parts of a loom in 3D.</p-->
20 </div>
21 </div>
22 </div>
23 <br>
24
25 <div class="row">
26 <div class="col-6" id="js_div">
27 <div class="instructions_section">
28 <div class="white_box"><h2 class="font1_h2">Instructions</h2>
29 <p id="loom_home_p1">To rotate the 3D loom, left click and drag with the mouse in any direction, to move the object, right click and drag in any direction and to zoom in and out, scroll the mouse or hold the middle mouse button and move the mouse. If you wish to view the main different parts either related to or part of the loom in more detail, simply click one of the links below which will take you to a separate page where you can also interact with these individual parts.</p>
30
31 <p id="loom_home_p2">To rotate the 3D loom, hold and swipe your finger in any direction, to move the object, press and hold with two fingers whilst moving in any direction and use two fingers to either spread to zoom in or pinch to zoom out. If you wish to view the main different parts either related to or part of the loom in more detail, simply tap one of the links below which will take you to a separate page where you can also interact with these individual parts.</p>
32 <br class="link_breaks"></div><br> <!--https://www.lipsum.com/feed/html - REFERENCE THIS-->
33
34 <a href="warp_beam_pg.html"><p class="link">WARP BEAM</p></a>
35 <a href="harness_frames_pg.html"><p class="link">HARNESS/FRAMES</p></a>
36 <a href="reeds_pg.html"><p class="link">REEDS</p></a>
37 <a href="heddles_pg.html"><p class="link">HEDDLES</p></a>
38 <a href="shuttle_pg.html"><p class="link">SHUTTLE</p></a>
39 <a href="takeup_mechanism_pg.html"><p class="link">TAKE-UP MECHANISM</p></a>
40 <button class="button_links">Main Menu</button>
41 <button class="button_links">3D Interactive Waterwheel</button>
42 <!--Information for Prototyping - https://www.linkedin.com/pulse/20141030195455-49457671-understanding-weaving-what-are-loom-->
43 </div> <!--Issue where I forgot to add div that meant the image was pushed onto another row - thought it was because I had added text center and div in-->
44 </div>
45
46
47 <div class="col-6">
48 <iframe src="3d_model.html" id="home_iframe" scrolling="no">
49 <p>Your browser does not support iframes.</p>
50 </iframe>
51 </div>
52 </div>
53
54 <br id="footer_break">
55
56 <div class="row">
57 <div class="col-12styled2">
58 <div class="footer">
59 <p>| Email Address: example@talktalk.co.uk | Telephone: 01234 567 890 | Address: ____</p>
60 </div>
61 </div>
62 </div>
63
64
65 </body>
66
67
68 </html>
```

The Outcome of the Web Page



The Individual Parts Pages

The Code for this Page at this Stage

The 'HTML' Code (An Example Because the Code was Identical for all the Other Pages)

```
dhwy2s2_pg.html x 3d_loom_pg.html x harness_frames_pg.html x
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4 <title>Harness/Frames of the Loom</title>
5 <meta charset="utf-8">
6 <link rel="stylesheet" href="styles/styleSheet.css">
7 <meta name="viewport" content="width=device-width, initial-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
8 <script src="js/three.js"></script>
9 <script src="js/ObjLoader.js"></script>
10 <script src="js/MTLLoader.js"></script>
11 <script src="js/OrbitControls.js"></script>
12
13 </head>
14
15 <body>
16 <div class="row">
17 <div class="col-12styled">
18 <div class="banner">
19 <h1>LOOM - HARNESS/FRAMES</h1>
20 <hr class="heading_line">
21 <a href="3d_loom_pg.html" class="return_link"><p>Return to 3D Loom Page</p></a>
22 </div>
23 </div>
24 </div>
25
26 <br>
27
28 <div class="row">
29 <div class="col-6">
30 <!--<div class="white_box2">-->
31 <div class="instructions_box">
32 <h2 class="font1_h2">Instructions</h2>
33 <p>To rotate the part, left click and drag with the mouse in any direction <br> To move the part, right click and drag in any direction <br> To zoom in and out, scroll the mouse
34 or hold the middle mouse button and move the mouse</p>
35 <!--<div class="content_box">-->
36 <h2 class="font1_h2">Description/Purpose of the Harness/Frames</h2>
37 <p>The harness/frames of the loom is the place where a warp is threaded through in order to change the pattern of the weave. The tool used for threading the harness/frames is
38 called a heddle hook where the hook is placed through the eye in the middle of the heddle, a warp yarn is then hooked on to the end and is then pulled through this eye. There is
39 also a harness guide which holds the frames in the same place in order to stop them from moving forwards and backwards.</p>
40 <!--https://www.linkedin.com/pulse/28141838195455-49457671-understanding-weaving-what-are-loom-->
41 <!--http://www.dictionary.com/browse/warp-beam-->
42 <!--</div>-->
43 </div>
44
45 <div class="instructions_box2">
46 <h2 class="font1_h2">Instructions</h2>
47 <p>To rotate the part, swipe with your finger or hold and drag with your finger <br class="force_break"> To move the part, press and hold with two fingers whilst moving in any
48 direction <br class="force_break"> To zoom in and out, pinch and spread two fingers</p>
49 <!--br Didn't want to work properly so I assigned a class and displayed it as a block to force it to function properly-->
50
51 <!--<div class="content_box2">-->
52 <h2 class="font1_h2">Description/Purpose of the Harness/Frames</h2>
53 <p>The harness/frames of the loom is the place where a warp is threaded through in order to change the pattern of the weave. The tool used for threading the harness/frames is
54 called a heddle hook where the hook is placed through the eye in the middle of the heddle, a warp yarn is then hooked on to the end and is then pulled through this eye. There is
55 also a harness guide which holds the frames in the same place in order to stop them from moving forwards and backwards.</p>
56 </div>
57 <!--</div>-->
58 </div>
59
60 <div class="col-6">
61 <iframe src="3d_model.html" class="individual_parts_iframe" scrolling="no"> <!--https://www.w3schools.com/tags/tag_iframe.asp - REFERENCE-->
62 <p>Your browser does not support iframes.</p>
63 </iframe>
64 </div>
65
66 <br>
67
68 <!--<hr id="hr">-->
69
70 <div class="row">
71 <div class="col-12styled2">
72 <div class="footer">
73 <p>| Email Address: example@talktalk.co.uk | Telephone: 01234 567 890 | Address: ____</p>
74 </div>
75 </div>
76
77 </body>
78 </html>
```

The Outcomes of the Different Web Pages

The Warp Beam Individual Part Page

LOOM - WARP BEAM

[Return to 3D Loom Page](#)

Instructions

To rotate the part, left click and drag with the mouse in any direction
To move the part, right click and drag in any direction
To zoom in and out, scroll the mouse or hold the middle mouse button and move the mouse

Description/Purpose of the Warp Beam

A warp is required before weaving can start and warps are threads which pass lengthwise through the loom where the weft thread is interwoven. A warp is made by winding a silk yarn on to bobbins through winding frames and after the winding process is complete, these bobbins are placed on to the creel. Then the yarn is threaded from the bobbins through three reeds and the threads are wound on to the warping mill in sections and the pattern is then created. The warping mill then winds the threads off and on to a warp beam placed at the back. This beam is able to then be placed onto a beam trolley which is then lowered to the weaving shed placed on the ground floor. This can then be placed into one of the twelve power looms within the mill.



| Email Address: example@talktalk.co.uk | Telephone: [01234 567 890](tel:01234 567 890) | Address: _____

The Harness/Frames Individual Part Page

LOOM - HARNESS/FRAMES

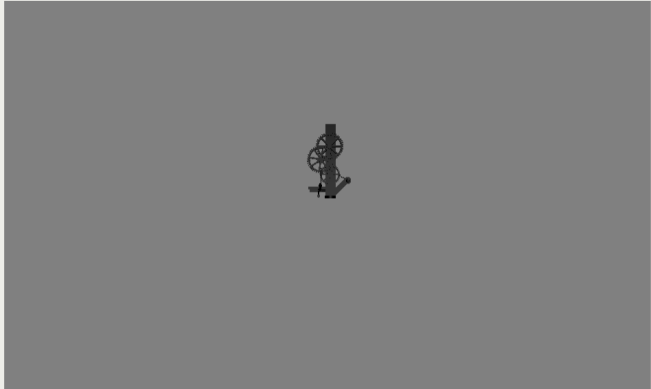
[Return to 3D Loom Page](#)

Instructions

To rotate the part, left click and drag with the mouse in any direction
To move the part, right click and drag in any direction
To zoom in and out, scroll the mouse or hold the middle mouse button and move the mouse

Description/Purpose of the Harness/Frames

The harness/frames of the loom is the place where a warp is threaded through in order to change the pattern of the weave. The tool used for threading the harness/frames is called a heddle hook where the hook is placed through the eye in the middle of the heddle, a warp yarn is then hooked on to the end and is then pulled through this eye. There is also a harness guide which holds the frames in the same place in order to stop them from moving forwards and backwards.



| Email Address: example@talktalk.co.uk | Telephone: [01234 567 890](tel:01234 567 890) | Address: _____

The Reed(s) Individual Part Page

LOOM - REED(S)


Return to 3D Loom Page

Instructions

To rotate the part, left click and drag with the mouse in any direction
To move the part, right click and drag in any direction
To zoom in and out, scroll the mouse or hold the middle mouse button and move the mouse

Description/Purpose of the Reed(s)

A yarn is threaded from items called bobbins through three reeds which are metal combs. The reeds push the last weft thread against the previous threads which creates a woven cloth. The reed is helped to beat-up the picks of weft by a let-off mechanism. There are spaces within the reeds called dents and the amount of dents for every inch can change depending on the type of cloth being woven. Whitchurch Silk Mill usually uses reeds between 56 and 70 dents for every inch. An item called a take-up roller/cloth beam is where this cloth is gathered once completed. The reed moves the lowest gear in a take-up mechanism as well because of it moving forwards and backwards.



| Email Address: example@talktalk.co.uk | Telephone: [01234 567 890](tel:01234 567 890) | Address: _____

The Heddles Individual Part Page

LOOM - HEDDLES

Return to 3D Loom Page


Instructions

To rotate the part, left click and drag with the mouse in any direction
To move the part, right click and drag in any direction
To zoom in and out, scroll the mouse or hold the middle mouse button and move the mouse

Description/Purpose of the Heddles

The heddles of a loom are made of either cord or wire and warp threads travel through these which are then divided in order for the weft threads to travel through the warp threads without any problems. The heddles connect to the shaft part of the loom.

INFORMATION USED FROM THIS SOURCE
<https://www.textileschool.com/articles/513/parts-of-loom>



| Email Address: example@talktalk.co.uk | Telephone: [01234 567 890](tel:01234 567 890) | Address: _____

The Shuttle Individual Part Page

LOOM - SHUTTLE

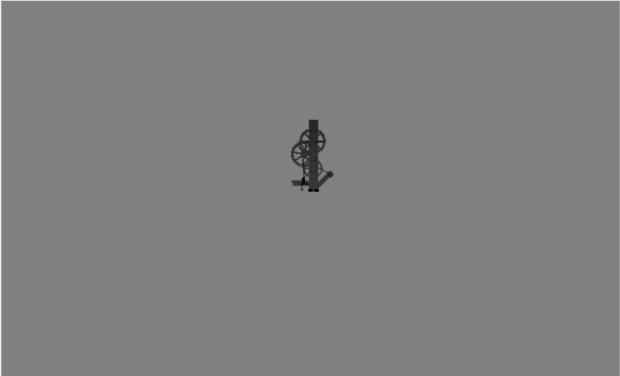
[Return to 3D Loom Page](#)

Instructions

To rotate the part, left click and drag with the mouse in any direction
To move the part, right click and drag in any direction
To zoom in and out, scroll the mouse or hold the middle mouse button and move the mouse

Description/Purpose of the Shuttle

The shuttle is involved in the picking process where it is passed through the warp ends, placing weft thread whilst doing so. When the shuttle is passed, this is called a pick. Weft thread is wound on to pins that are placed in a shuttle and a smaller type of shuttle is used at Whitchurch Silk Mill because of the type of weft being very fine. The steel tongue inside the shuttle contains the pin and steel tips which lead the way through the gap in the warp threads. There is a part of the loom called a shuttle race where the shuttle then travels along this for every pick. A picking stick shoots the shuttle to both sides of the loom. Whilst resting after each pick, the shuttle sits within an item called a shuttle box.



| Email Address: example@talktalk.co.uk | Telephone: 01234 567 890 | Address: _____

The Take-up Mechanism Individual Part Page

LOOM - TAKE-UP MECHANISM


[Return to 3D Loom Page](#)

Instructions

To rotate the part, left click and drag with the mouse in any direction
To move the part, right click and drag in any direction
To zoom in and out, scroll the mouse or hold the middle mouse button and move the mouse

Description/Purpose of the Warp Beam

The take-up mechanism is made of many gears where the lowest is moved by the movement of the reed and this movement is then transferred to the gear placed at the top. This is connected to the cloth beam that allows for the cloth to be drawn slowly through the loom. The smallest gear is called the change wheel which is able to be changed to either increase or decrease the speed that the cloth beam turns. The amount of picks for every inch in the cloth determines the speed that the cloth should be gathered on to the beam.



| Email Address: example@talktalk.co.uk | Telephone: 01234 567 890 | Address: _____

The 'CSS' Code for All Elements

```
dhw_y2s2_pg.html x 3d_loom_pg.html x stylesheet.css x
1 body{
2   /*background-color: rgba(128, 128, 128, 0.4);*/
3   background-color: #eeeeee9
4 }
5
6 h1{
7   font-family: Bell MT;
8   color: purple;
9   /*font-size: 5em; Caused font to spread over div*/
10  font-size: 50px; /*Also problem with font spreading over div*/
11 }
12
13 h2{
14   font-family: Arial;
15 }
16
17 .font1_h2{
18   color: #928a6d;
19   font-weight: lighter;
20   font-size: 2em;
21   font-family: 'Bell MT'; /*Josh Sent this to insert*/
22   font-style: normal;
23   font-weight: 400;
24   src: url(http://themes.googleusercontent.com/Licensed/font?kit=kmLaTfxu8bXVwPRVUug) format('truetype');
25 }
26
27 h3{
28   font-family: Arial;
29 }
30
31 p{
32   font-family: Trebuchet MS;
33 }
34
35 @font-face {
36   font-family: 'Bell MT';
37   font-style: normal;
38   font-weight: 400;
39   src: url(http://themes.googleusercontent.com/Licensed/font?kit=kmLaTfxu8bXVwPRVUug) format('truetype');
40 }
41
```

```
dhw_y2s2_pg.html x 3d_loom_pg.html x stylesheet.css x
41
42 .button_links{
43   background-color: #7e308b;
44   font-family: Trebuchet MS, sans-serif;
45   color: white;
46   border: none;
47   cursor: pointer;
48   width: 200px;
49   height: 50px;
50   border-radius: 10px;
51   transition: 0.5s;
52 }
53
54 .button_links:hover{
55   background-color: white;
56   color: #7e308b;
57   transition: 0.5s;
58 }
59
60 /*Generic Items for the Web Pages*/
61
62 .heading_line{
63   width: 60%;
64   border: 2px solid #928a6d; /*https://www.w3schools.com/colors/
65 }
66
67 .return_link{
68   color: black;
69   text-decoration: none;
70   transition: 0.5s;
71 }
72
73 .return_link:hover{
74   color: #7e308b;
75   transition: 0.5s;
76 }
77
78 .force_break{
79   display: block;
80 }
81
82 .row::after { /*w3schools - REFERENCE*/
83   content: "";
84   clear: both;
85   display: table;
86 }
87
88
```

```
89 [class*="col-"] {
90   float: left;
91   /*padding: 15px;
92   /*border: 1px solid red; /*w3schools - REFERENCE*/
93 }
94
95 /*w3schools - REFERENCE DONE*/ /*These are the columns which are
96 /*FOR MOBILE SCREENS*/
97 [class*="col-"] {
98   width: 100%;
99 }
100
101 @media only screen and (min-width: 600px) {
102   /*FOR TABLETS*/
103   .col-m-1 {width: 8.33%;}
104   .col-m-2 {width: 16.66%;}
105   .col-m-3 {width: 25%;}
106   .col-m-4 {width: 33.33%;}
107   .col-m-5 {width: 41.66%;}
108   .col-m-6 {width: 50%;}
109   .col-m-7 {width: 58.33%;}
110   .col-m-8 {width: 66.66%;}
111   .col-m-9 {width: 75%;}
112   .col-m-10 {width: 83.33%;}
113   .col-m-11 {width: 91.66%;}
114   .col-m-12 {width: 100%;} /*w3schools - REFERENCE*/
115 }
116
117 @media only screen and (min-width: 768px) { /*THIS IS WHAT YOU NEED
118   /*FOR DESKTOPS*/
119   .col-1 {width: 8.33%;}
120   .col-2 {width: 16.66%;}
121   .col-24 {width: 20%;}
122   .col-3 {width: 25%;}
123   .col-4 {width: 33.33%;}
124   .col-5 {width: 41.66%;}
125   .col-6 {width: 50%;}
126   .col-7 {width: 58.33%;}
127   .col-8 {width: 66.66%;}
128   .col-9 {width: 75%;}
129   .col-10 {width: 83.33%;}
130   .col-11 {width: 91.66%;}
131   .col-12 {width: 100%;} /*w3schools REFERENCE - https://www.w3schools.com/css/default.asp?filepath=/css/col-12.html
132   .col-12styled {width: 100%;}
133   .col-12styled2 {width: 100%;}
134 }
135
```

```

136 .banner{
137   /*background-color: rgba(128, 128, 128, 0.01);*/
138   text-align: center;
139   width: 100%;
140   height: auto;
141 }
142
143 .banner h1{
144   padding: 10px;
145 }
146
147 #hr{
148   width: 100%;
149 }
150
151 /*#js_div2{
152   width: 600px;
153   height: 600px;
154   background-color: red;
155 }*/
156
157 #home_iframe{
158   width: 100%;
159   height: 793px;
160   border: none;
161 }
162
163 .individual_parts_iframe{
164   width: 50%;
165   height: 500px;
166   display: block;
167   margin: auto;
168   border: none;
169 }
170
171 .navigation_bar{ /*Cherry Childcare project - reference*/
172   background-color: none;
173   overflow: hidden;
174   text-align: center;
175   padding-bottom: 0px;
176   padding-top: 0px;
177 }
178
179 #nav_bar_background{
180   background-color: white;
181 }
182
183 .navigation_bar a{
184   text-decoration: none;
185   color: black;
186   transition: 0.5s;
187   padding-left: 20px;
188   padding-right: 20px;
189   font-family: Arial;
190   font-weight: 500;
191 }
192
193 .navigation_bar a:hover{
194   color: green;
195   transition: 0.5s;
196   background-color: none;
197 }
198
199 .navigation_bar .icon{
200   display: none;
201 } /*Cherry Childcare end*/
202
203 .main_content{
204   background-color: red;
205   text-align: center;
206 }
207
208 .main_content2{
209   background-color: orange;
210   text-align: center;
211 }
212
213 .test_image{
214   display: block;
215   width: 100%;
216   height: auto;
217   margin: auto;
218   border: 2px solid black;
219 }
220
221 #test_button{
222   display: inline-block;
223   margin: auto;
224   background-color: none;
225   border: none;

```

```

225 .buttons {
226   width: 450px;
227   height: 50px;
228   cursor: pointer;
229   border: 1px solid red;
230 }
231
232 #part1{
233   width: 300px;
234   height: 50px;
235   cursor: pointer;
236 }
237
238 #part2{
239   width: 300px;
240   height: 50px;
241   cursor: pointer;
242 }
243
244 #part3{
245   width: 300px;
246   height: 50px;
247   cursor: pointer;
248 }
249
250 #part4{
251   width: 300px;
252   height: 50px;
253   cursor: pointer;
254 }
255
256 #part5{
257   width: 300px;
258   height: 50px;
259   cursor: pointer;
260 }
261
262 #part6{
263   width: 300px;
264   height: 50px;
265   cursor: pointer;
266 }
267
268 #part7{
269   width: 300px;
270   height: 50px;
271   cursor: pointer;
272 }

```

```

273
274 #part8{
275   width: 300px;
276   height: 50px;
277   cursor: pointer;
278 }
279
280 #part9{
281   width: 300px;
282   height: 50px;
283   cursor: pointer;
284 }
285
286 #part10{
287   width: 300px;
288   height: 50px;
289   cursor: pointer;
290 }
291
292 .instructions_section{
293   text-align: center;
294   padding: 30px;
295 }
296
297 .instructions_section a{
298   color: white;
299   text-decoration: none;
300   font-weight: bold;
301   background-color: #7e308b;
302   width: 40%;
303   height: auto;
304   display: inline-block;
305   transition: 0.5s;
306 }
307
308 .instructions_section a:hover{
309   background-color: white;
310   transition: 0.5s;
311   color: #7e308b;
312 }
313
314 .linkof{
315   font-family: Trebuchet MS, sans-serif;
316 }
317
318

```

```

319
320 .instructions_section p{
321   padding: 0px;
322 }
323
324 .instructions_box h2{
325   text-align: center;
326   padding: 10px;
327 }
328
329 .instructions_box p{
330   text-align: center;
331   padding: 10px;
332 }
333
334 .instructions_box{
335   /*border: 1px solid black;*/
336   margin-left: 20px;
337   margin-right: 20px;
338   margin-top: 35px;
339   background-color: white;
340   padding: 10px;
341   border-radius: 10px;
342 }
343
344 .instructions_box2{
345   display: none;
346 }
347
348 .content_box{
349   /*border: 1px solid black;*/
350 }
351
352 .content_box{
353   text-align: center;
354   padding: 0px;
355 }
356
357 .content_box h3{
358   color: red;
359   padding: 10px;
360   text-align: center;
361 }
362
363 .content_box2{
364   display: none;
365 }

```

```

366 .part_image {
367     width: 100%;
368     height: 250px;
369     border: 2px solid black;
370 }
371
372 .part_content{
373     text-align: center;
374 }
375
376 .responsive_break{
377     display: none;
378 }
379
380 .footer{
381     background-color: rgba(128, 128, 128, 0.01);
382     color: black;
383     height: 50px;
384     text-align: center;
385     border-top: 2px solid #999966;
386 }
387
388 .footer p{
389     padding-top: 10px;
390 }
391
392 .white_box{
393     background-color: white;
394     padding: 10px;
395     border-radius: 10px;
396 }
397
398 /*.white_box2{
399     background-color: white;
400     padding: 10px;
401     border-radius: 10px;
402     width: 600px;
403     margin-left: 60px;
404     display: block;
405     margin-bottom: 60px;
406 }*/
407
408 #loom_home_p2{
409     display: none;
410 }
411
412
413 .source_link{
414     color: #7e308b;
415 }
416
417 @media screen and (max-width: 600px) { /*
418     .responsive_break{
419         display: block;
420     }
421
422     .instructions_section{
423         text-align: center;
424         padding: 5px;
425     }
426
427     .instructions_section a{
428         width: 100%;
429         border-radius: 10px;
430         height: auto;
431         display: block;
432     }
433
434     .instructions_section p{
435         padding-top: 0px;
436     }
437
438     /*br{
439         display: none;
440     } This was the reason the br tags wer
441
442     .part_image {
443         width: 100%;
444         height: auto;
445         border: 2px solid black;
446     }
447
448     /*.col-12styled{
449         background-color: rgba(128, 128,
450         /* border-bottom: 2px solid black;
451     }*/
452
453     /*.col-12styled2{
454         background-color: rgba(128, 128,
455     } Removed this and the font then did
456
457     #footer_break{
458         display: block;
459     }

```

```

460
461 .individual_parts_iframe{
462     width: 100%;
463     height: 500px;
464     display: block;
465 }
466
467 .instructions_box{
468     display: none;
469 }
470
471 .instructions_box2{
472     display: block;
473     /*border: 1px solid black;*/
474     background-color: white;
475     padding: 10px;
476     border-radius: 10px;
477 }
478
479 .instructions_box2 h2{
480     text-align: center;
481     padding-top: 10px;
482 }
483
484 .instructions_box2 p{
485     text-align: center;
486     padding-left: 10px;
487     padding-right: 10px;
488 }
489
490 .content_box2{
491     display: block;
492     border: 1px solid black;
493     text-align: center;
494     padding: 10px;
495 }
496
497 .content_box2 h3{
498     color: red;
499 }
500
501 .content_box2{
502     display: block;
503 }
504
505 .content_box{
506     display: none;
507 }
508
509 #home_iframe{
510     height: 300px;
511 }
512
513 .individual_parts_iframe{
514     height: 300px;
515 }
516
517 #loom_home_p1{
518     display: none;
519 }
520
521 #loom_home_p2{
522     display: block;
523 }
524
525 #home_iframe{
526     max-width: 100%;
527     height: 500px;
528     border: none;
529 }
530
531 }
532
533 @media only screen and (min-width: 600px) and (max-width: 768px) { /*TH
534     .instructions_section{
535         text-align: center;
536         padding: 5px;
537     }
538
539     .instructions_section a{
540         width: 100%;
541         border-radius: 10px;
542         height: auto;
543         display: block;
544         padding-top: 10px;
545     }
546
547     .instructions_section p{
548         padding-top: 0px;
549     }
550
551     /*br{
552         display: none;
553     }*/
554

```



```

509 #home_iframe{
510     height: 300px;
511 }
512
513 .individual_parts_iframe{
514     height: 300px;
515 }
516
517 #loom_home_p1{
518     display: none;
519 }
520
521 #loom_home_p2{
522     display: block;
523 }
524
525 #home_iframe{
526     max-width: 100%;
527     height: 500px;
528     border: none;
529 }
530
531 }
532
533 @media only screen and (min-width: 600px) and (max-width: 768px) { /*Th
534     .instructions_section{
535         text-align: center;
536         padding: 5px;
537     }
538
539     .instructions_section a{
540         width: 100%;
541         border-radius: 10px;
542         height: auto;
543         display: block;
544         padding-top: 10px;
545     }
546
547     .instructions_section p{
548         padding-top: 0px;
549     }
550
551     /*br{
552         display: none;
553     }*/
554
555     .part_image {
556         width: 100%;
557         height: auto;
558         border: 2px solid black;
559     }
560
561     /*.col-12styled{
562         background-color: rgba(128, 128, 128, 0.4);
563         border-bottom: 2px solid black;
564     }*/
565
566     /*.col-12styled2{
567         background-color: rgba(128, 128, 128, 0.4);
568     }*/
569
570     #footer_break{
571         display: block;
572     }
573
574     .individual_parts_iframe{
575         width: 100%;
576         height: 763px;
577         display: block;
578     }
579
580     .instructions_box{
581         display: none;
582     }
583
584     .instructions_box2{
585         display: block;
586         display: block;
587         background-color: white;
588         padding: 10px;
589         border-radius: 10px;
590         /*border: 1px solid black;*/
591     }
592
593     .instructions_box2 h2{
594         text-align: center;
595         padding-top: 10px;
596     }
597

```

```

597
598     .instructions_box2 p{
599         text-align: center;
600         padding-left: 10px;
601         padding-right: 10px;
602     }
603
604     .content_box2{
605         display: block;
606         border: 1px solid black;
607         text-align: center;
608         padding: 10px;
609     }
610
611     .content_box2 h3{
612         color: red;
613     }
614
615     .content_box2{
616         display: block;
617     }
618
619     .content_box{
620         display: none;
621     }
622
623     .linkp{
624         height: 40px;
625     }
626
627     #loom_home_p1{
628         display: none;
629     }
630
631     #loom_home_p2{
632         display: block;
633     }
634
635     #home_iframe{
636         max-width: 100%;
637         height: 763px;
638         border: none;
639     }
640
641 }
642
643 @media only screen and (min-width: 768px){
644     .instructions_section{
645         text-align: center;
646         padding: 5px;
647     }
648
649     .instructions_section a{
650         width: 100%;
651         margin: auto;
652         height: auto;
653         display: block;
654         border-radius: 10px;
655         padding-top: 10px;
656     }
657
658     .instructions_section p{
659         padding-top: 0px;
660     }
661
662     .test_image{
663         display: block;
664         width: 100%;
665         height: 785px;
666         margin: auto;
667         border: 2px solid black;
668     }
669
670     .link_breaks{
671         display: none;
672     } /*Restyling on different screen sizes*/
673
674     .individual_parts_iframe{
675         width: 100%;
676     }
677
678     .linkp{
679         height: 40px;
680     }
681

```


The Code for Implementing the Model on a Separate Page

```
dhw_y2s2_pg.html x 3d_loom_pg.html x stylesheet.css x 3d_model.html x
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <title>3d Loom Model</title>
5   <meta name="viewport" content="width=device-width, user-scalable=no, minimum-scale=1.0, maximum-scale=1.0"> <!--https://www.w3schools.com/css/css_rwd_viewport.asp REFERENCE-->
6   <!--https://www.google.co.uk/search?source=hp&ei=zbuVnT6DcvekGwZrregUQ&q=iframe+expands+when+on+phone&oq=iframe+expands+when+on+phone&gs_l=psy-ab.3...1657.7305.0.7484.28.25.0.3.3.0.
   117.1903.20j5.25.0...0...1c.1.64.psy-ab..0.27.1859...0j0i131k1j0i131146k1j46i131k1j0i22130k1j33122129130k1j331160k1j33121k1.0.0DwVrHG0F3g-->
7 </head>
8 <body>
9   <script src="js/three.js"></script>
10  <script src="js/ObjLoader.js"></script>
11  <script src="js/TrackballControls.js"></script> <!--https://www.youtube.com/watch?v=4_KkHlmetQ REFERENCE-->
12  <script>
13    var container;
14
15    var camera, controls, scene, renderer;
16    //var divtest = document.getElementById("js_div2");
17    //var CANVAS_WIDTH = 600;
18    //var CANVAS_HEIGHT = 600; //https://codepen.io/tjuro/pen/mmYKyK
19
20    //var mouseX = 20, mouseY = 20;
21
22    //var windowHalfX = window.innerWidth / 2;
23    //var windowHalfY = window.innerHeight / 2;
24
25    init();
26    animate();
27
28
29
30    function init() {
31
32      var container = document.createElement( 'div' ); //https://stackoverflow.com/questions/6840326/how-can-i-create-and-style-a-div-using-javascript REFERENCE
33      //https://stackoverflow.com/questions/40187942/three-js-how-to-toggle-camera-position-if-mouse-is-clicked REFERENCE //https://developer.mozilla.org/en-
34      US/docs/Web/API/Document/createElement REFERENCE
35      container.setAttribute('class', 'col-12');
36      document.body.appendChild( container );
37
38      camera = new THREE.PerspectiveCamera( 45, window.innerWidth / window.innerHeight, 1, 2000 ); //https://stackoverflow.com/questions/19827030/renderer-sets-size-calculation-by-
39      //percent-of-screen-three-js https://stackoverflow.com/questions/12583528/positioning-the-three-js-container-as-an-html-div https://github.com/mrdoob/three.js/issues/352
40      //https://github.com/mrdoob/three.js/blob/master/examples/webgl_loader_obj.html REFERENCE
41      camera.position.z = 10;
42
43      // scene
44
45      scene = new THREE.Scene();
46      scene.background = new THREE.Color( 0x808080 ); //https://stackoverflow.com/questions/16177056/changing-three-js-background-to-transparent-or-other-color
47      //https://stackoverflow.com/questions/20495302/transparent-background-with-three-js
48
49      var ambientLight = new THREE.AmbientLight( 0xcccccc, 0.4 );
50      scene.add( ambientLight );
51
52      var pointLight = new THREE.PointLight( 0xffffff, 0.8 );
53      camera.add( pointLight );
54      scene.add( camera );
55
56      // texture
57
58      var manager = new THREE.LoadingManager();
59      manager.onProgress = function ( item, loaded, total ) {
60        console.log( item, loaded, total );
61      };
62
63      var textureLoader = new THREE.TextureLoader( manager );
64      var texture = textureLoader.load( 'model/Take-Up-Mechanism.mtl' );
65
66      // model
67
68      var onProgress = function ( xhr ) {
69        if ( xhr.lengthComputable ) {
70          var percentComplete = xhr.loaded / xhr.total * 100;
71          console.log( Math.round(percentComplete, 2) + '% downloaded' );
72        }
73      };
74
75      var onError = function ( xhr ) {
76      };
77
78      var loader = new THREE.ObjLoader( manager );
79      loader.load( 'model/Take-Up-Mechanism.obj', function ( object ) {
80
81        object.traverse( function ( child ) {
82
83          if ( child instanceof THREE.Mesh ) {
84
85            child.material.map = texture;
86
87          }
88
89        } );
90
91        object.position.y = 0;
92        scene.add( object );
93      } );
94    }
95  </script>
96 </body>
97 </html>
```












```
137
138
139     function animate() {
140         requestAnimationFrame( animate );
141         render();
142         controls.update();
143     }
144
145     function render() {
146         //camera.position.x += ( mouseX - camera.position.x ) * .05;
147         //camera.position.y += ( - mouseY - camera.position.y ) * .05;
148
149         //camera.lookAt( scene.position );
150
151         //divtest.appendChild(renderer.domElement);
152
153         renderer.render( scene, camera );
154     }
155
156
157
158
159 </script>
160
161 </body>
162 </html>
```

Adding the Work to a ‘zip’ File to Send to the Other Developer

The ‘zip’ File

 dan_3d_loom_work.zip

The Files and Folders Within the ‘zip’ File

-  js
-  model
-  styles
-  3d_loom_pg.html
-  3d_model.html
-  harness_frames_pg.html
-  heddles_pg.html
-  reeds_pg.html
-  shuttle_pg.html
-  takeup_mechanism_pg.html
-  warp_beam_pg.html

Other Issues/Problems with the Project

Introduction/Overview

There were a few areas which I had to either change or fix which will be explained below.

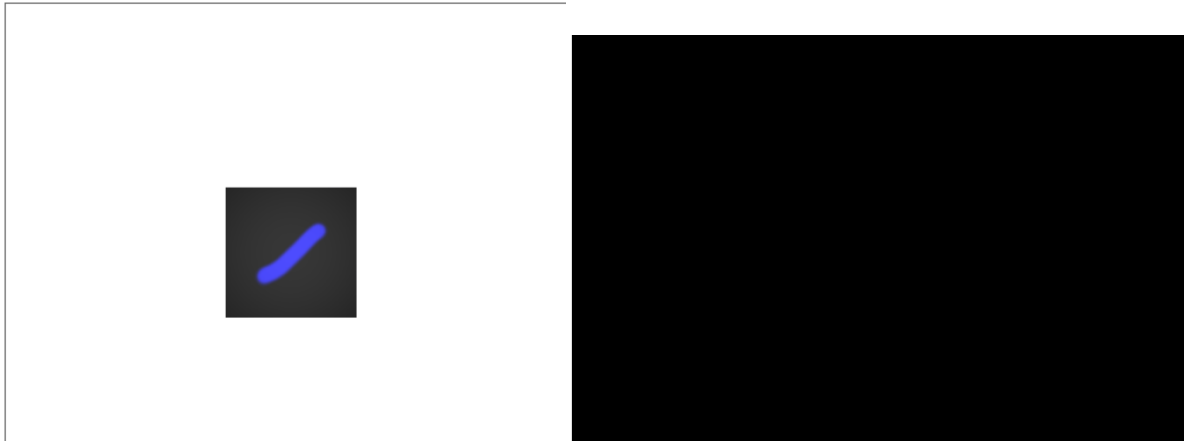
The Flashing Scene/Renderer Issue

Introduction/Overview

There was an issue where the scene/renderer flashed black and white when resizing the browser window which was an issue as this could have affected those with epilepsy. To fix this, I found a piece of code which can be viewed below.

As is evident below, I found the piece of code which would continuously render the scene when resizing the window and this is highlighted below.

The Actual Issue



The Integrated Code to Resolve the Issue

```
function onWindowResize() {  
    //windowHalfX = window.innerWidth / 2;  
    //windowHalfY = window.innerHeight / 2;  
  
    camera.aspect = window.innerWidth / window.innerHeight;  
    camera.updateProjectionMatrix();  
  
    renderer.setSize( window.innerWidth, window.innerHeight );  
  
    renderer.render(scene, camera); //Helped fix the flickering of  
    without-flicker  
}
```


Removing the 'onclick' Event for Closing the Current Window

Introduction/Overview

Another area I had changed was removing the 'onclick' event to allow for the user to close down the current window when on a separate page regarding an individual parts page. This was inspired by one of the designers in the group which suggested if it was possible to stop a separate tab appearing when selecting an individual part to go to a separate page. Therefore, I thought it would have been good to change the code to the following which can be viewed below.

The Changed Code

Removing 'target="_blank"' from Each of the Page Links to Cause the Page to Change to the Link Selected

```
<a href="warp_beam_pg.html"><p class="linkp">WARP BEAM</p></a>
<a href="harness_frames_pg.html"><p class="linkp">HARNESS/FRAMES</p></a>
<a href="reeds_pg.html"><p class="linkp">REED(S)</p></a>
<a href="heddles_pg.html"><p class="linkp">HEDDLES</p></a>
<a href="shuttle_pg.html"><p class="linkp">SHUTTLE</p></a>
<a href="takeup_mechanism_pg.html"><p class="linkp">TAKE-UP MECHANISM</p></a>
<button class="button_links">Main Menu</button>
<button class="button_links">3D Interactive Waterwheel</button>
```

Removing the 'onclick' Event and Adding a Link to the Main Page Which Would Have Taken the User Back to the 3D Loom Page

```
15 <body>
16 <div class="row">
17 <div class="col-12styled">
18 <div class="banner">
19 <h1>LOOM - HARNESS/FRAMES</h1>
20 <hr class="heading_line">
21 <a href="3d_loom_pg.html" class="return_link"><p>Return to 3D Loom Page</p></a>
22 </div>
23 </div>
24 </div>
```

Final Stages of the Project

Introduction/Overview

After receiving advice from the critique review on 20th March, it was then known that both my and the other developer's work had to have a more unified design. After receiving some of the code from the other developer to help with this, I then attempted to undertake this with my work.

As will be evident below, I received the 'HTML' code from the other developer which I edited to suit the code I had produced. The 'CSS' code below was to style the 'HTML' code that had been written and this was received from the other developer.

As will be evident below, the buttons/links appeared in the 'iframe' and when clicking on one of the buttons, it would have then loaded that page into the 'iframe'. This was achieved through duplicating the '3d_model.html' file and changing it for the different parts of the loom as explained and helped by the other developer. This was then repeated for all of the other model parts.

The Code at this Stage

The Integrated 'HTML' Code in the '3d_model.html' File

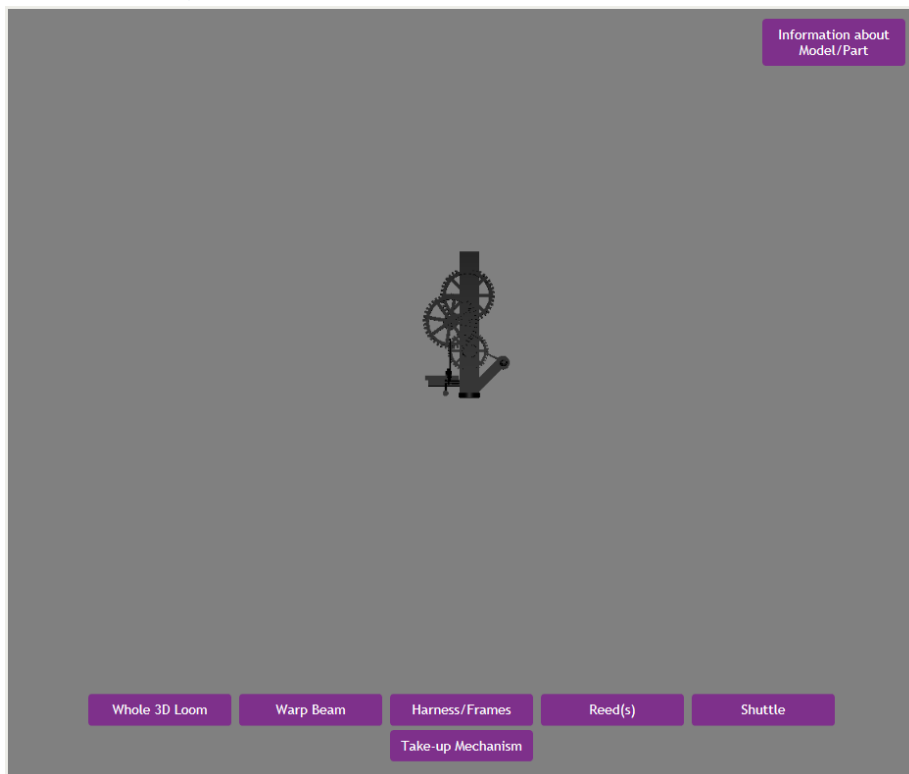
```
14 <!--Josh Code Start-->
15 <div class="iframe_header">
16     <a href="#" TARGET="iframe2"><div class="button2">Information about Model/Part</div></a>
17 </div>
18
19 <div class="iframe_footer">
20     <a href="3d_model.html"><div class="button">Whole 3D Loom</div></a>
21     <a href="model_pages/warp_beam_model.html"><div class="button">Warp Beam</div></a>
22     <a href="model_pages/harness_model.html"><div class="button">Harness/Frames</div></a>
23     <a href="model_pages/reeds_model.html"><div class="button">Reed(s)</div></a>
24     <a href="model_pages/shuttle_model.html"><div class="button">Shuttle</div></a>
25     <a href="model_pages/take_up_mechanism_model.html"><div class="button">Take-up Mechanism</div></a>
26 </div>
27 <!--Josh Code End-->
```

The Received 'CSS' Code for the Integrated 'HTML' Code

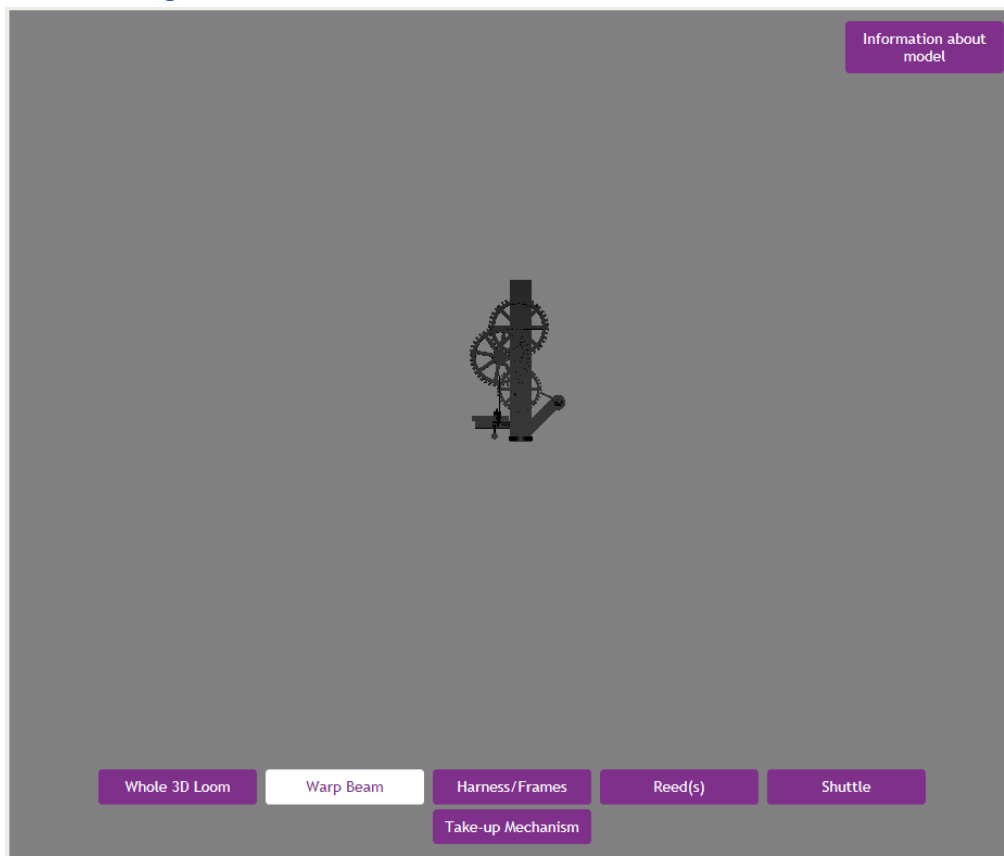
```
422
423 /*STYLE FOR IFRAME - JOSH CODE*/
424 .iframe_footer {
425     position: absolute;
426     right: 0;
427     bottom: 0;
428     left: 0;
429     padding: 1rem;
430     text-align: center;
431 }
432
433 .iframe_header {
434     position: absolute;
435     right: 0;
436     top: 0;
437     padding: 1rem;
438     text-align: center;
439 }
440
```

The Outcome on the Web Page

Before Selecting One of the Buttons/Links

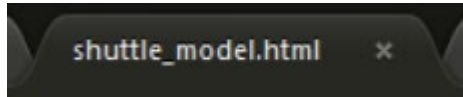


After Selecting One of the Buttons/Links



An Example of Duplicating the '3d_model.html' and Changing this for the Different Parts

Renaming the File Name



Altering the File for this Part

```
<!--Josh Code Start-->
<div class="iframe_header">
  <a href="#" TARGET="iframe2"><div class="button2">Information about model</div></a>
</div>

<div class="iframe_footer">
  <a href="../3d_model.html"><div class="button">Whole 3D Loom</div></a>
  <a href="warp_beam_model.html"><div class="button">Warp Beam</div></a>
  <a href="harness_model.html"><div class="button">Harness/Frames</div></a>
  <a href="reeds_model.html"><div class="button">Reed(s)</div></a>
  <a href="shuttle_model.html"><div class="button">Shuttle</div></a>
  <a href="take_up_mechanism_model.html"><div class="button">Take-up Mechanism</div></a>
</div>
<!--Josh Code End-->
```

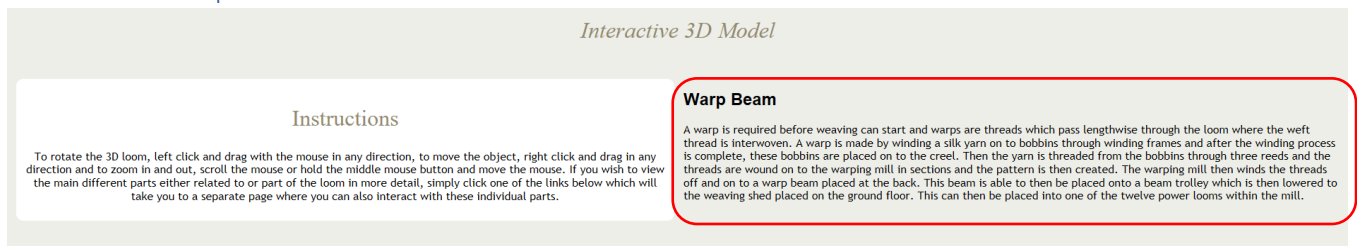
Difficulties with Displaying the Information in a Separate 'iframe'

Introduction/Overview

I did, however, find it difficult to display the information for each model part in a separate iframe once the 'Information about model' button was selected. This is evident below.

As can be seen below, once I had selected the button, this caused the model to disappear and show the information whereas I wanted it to be displayed under the 'Instructions' section. I couldn't find how to solve this. Therefore, I suggested to the other developer if they could have changed the files I had sent for the critique to match the design of what he had produced. This was due to the fact that they knew best of what to do. This was agreed and therefore this task was provided to them.

The Issue I had Experienced



Unsolved Issues

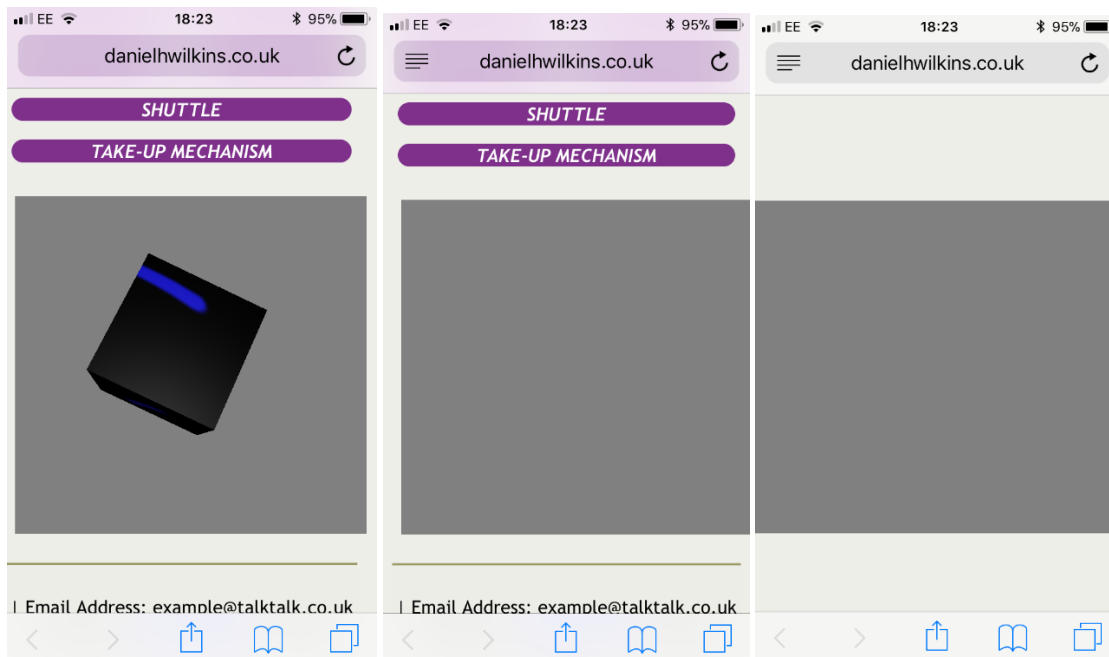
The 3D Model Issue on Smartphone and Tablet Devices ('iOS')

Introduction/Overview

There was one issue which was where the 3D model would have appeared on the web page for the first time without any problems but when refreshing the page, this caused the 3D model to slide to the right and disappear off of the screen with either the 'iframe', renderer or scene expanding its width to an extreme distance. This can be viewed below.

This was a problem which I believed thought could have been resolved by informing the client that when loading the page to not refresh the browser and to use it when it has loaded for the first time. This issue didn't appear on desktop however, which was strange. It seemed to depend on the device utilised. However, as will noticeable later when continuing the project during the summer period, this was resolved.

The Actual Issue



Interaction Issues

Introduction/Overview

There were also some issues which related to the type of model included on the web page which I believed still existed on the final group outcome at the end of this semester. This meant that the model would have rotated and the user could have interacted with it. However, for example, when rotating the 3D model, this would have rotated at a different angle to the cube as it would have rotated at a larger scale rather than remaining centrally and rotating. This was something that would have needed to have been fixed if this became a serious problem when providing the outcome to the client when required.

Proof of Communication Via E-mails, Provided by the Client

“We have been in regular communication with Daniel and his team working on the 3D Loom project for the new digital interpretation that will be installed in Whitchurch Silk Mill. Throughout our correspondence Daniel maintained a professional and polite manner to any staff member he has been communicating with, and his emails have always been clear and sincere. Daniel’s attention to detail, and especially his commitment to complying with the client’s wishes is clearly displayed within the various emails requesting information to help with the creation of the 3D Loom project.”

“I was particularly impressed that Daniel had produced a project precis for us, the client, outlining the requirements of the 3D loom brief, research (including a bibliography) and drawings, as well as possible problems and solutions that might emerge when completing the project. Based on the correspondence between himself and the Mill, I feel assured that the end product Daniel and the team have produced will be of a high standard.”

Please Note: Although I didn’t place the precis together, I did collect the majority of the information for the contents of it.

Conclusion

This was now the end of the project for this semester. To view the outcomes, both individual and group, please select the relevant links provided on the page for this project on my personal website. These are provided within the ‘Y2S2 PROCESSES’ section of the web page.

Reference List/Bibliography/Acknowledgements for this Project for Year 2 Semester 2

Barker, S. (2018) Teaching to Daniel Wilkins, 13 February.

Brasington, C. (2016) three.js object loader. Available at: <http://bl.ocks.org/chrisbrasington/fcf701b424256d671c95>. [Last Accessed 23rd March 2018], [online].

Dictionary.com (2018) warp beam. Available at: <http://www.dictionary.com/browse/warp-beam>. [Last Accessed 27th March 2018], [online].

Doyle, S. (ed.) (2008) *Essential ICT for WJEC*. United Kingdom: Folens Limited.

ENCYCLOPEDIA BRITANNICA (n.d.) The weaving process. *Textile*. Available at: <https://www.britannica.com/topic/textile/The-weaving-process#ref359400>. [Last Accessed 27th March 2018], [online].

feel_funny (2012) Simple table. TURBOSQUID. feel_funny. Available at: <https://www.turbosquid.com/3d-models/free-max-mode-simple-table/684862>. [Last Accessed 27th March 2018], [online].

Flickr. (2018). Silk taffeta being woven on a 19th Century tappet loom at Whitchurch Silk Mill in Hampshire. [online] Available at: <https://www.flickr.com/photos/anguskirk/7706581486> [Accessed 2 Feb. 2018].

Gibbons, S. (2016) Design Thinking 101. Available at: <https://www.nngroup.com/articles/design-thinking/>. [Last Accessed 2nd February 2018], [online].

Gunnison, J. (n.d.) Textured OBJ Model with Three.js. CodePen. Jon Gunnison. Available at: <https://codepen.io/jgunnison/pen/LVZaBp>. [Last Accessed 1st April 2018], [online].

GOV.UK (2017) Understanding WCAG 2.0. Available at: <https://www.gov.uk/service-manual/helping-people-to-use-your-service/understanding-wcag-20>. [Last Accessed 22nd March 2018], [online].

heisters (2015) Orbit Controls for THREE.js. heisters. Available at: <https://gist.github.com/heisters/1146b7f20149e1e3925b>. [Last Accessed 23rd March 2018], [online].

Juro, T. (n.d.) Three.js Scene in a div container. Available at: <https://codepen.io/tjuro/pen/mmYKyK>. [Last Accessed 23rd March 2018], [online].

Kakkad, A. (2016) Steps to use Legacy Swift in Xcode 8. *Ashish Kakkad*. September 21. Available at: <http://ashishkakkad.com/2016/09/steps-to-use-legacy-swift-in-xcode-8/>. [Last Accessed 29th January 2018], [online].

Kris Occhipinti (2014) *Basic Trackball Camera Controls with Threejs HTML5 3D Rotation Tutorial*. Available at: https://www.youtube.com/watch?v=4_KkHLimetQ. [Last Accessed 23rd March 2018], [online].

Learn Threejs (2018) Load a 3D Model Using the Three.js OBJ Loader. Available at: <https://www.youtube.com/watch?v=wHuSQ7I1aKs>. [Last Accessed 23rd March 2018], [online].

Lipsum (n.d.) Lorem Ipsum. Available at: <https://www.lipsum.com/feed/html>. [Last Accessed 15th March 2018], [online].

Lewis, P. (2011) Getting Started with Three.js. Available at:
<https://www.html5rocks.com/en/tutorials/three/intro/>. [Last Accessed 23rd March 2018], [online].

MDN (2017) Canvas API. Available at: https://developer.mozilla.org/en-US/docs/Web/API/Canvas_API. [Last Accessed 29th January 2018], [online].

MDN web docs (2005) Basic animations. Available at: https://developer.mozilla.org/en-US/docs/Web/API/Canvas_API/Tutorial/Basic_animations. [Last Accessed 27th March 2018], [online].

MDN web docs (2005) Document.createElement(). Available at: <https://developer.mozilla.org/en-US/docs/Web/API/Document/createElement>. [Last Accessed 23rd March 2018], [online].

MDN (2018) The WebGL API: 2D and 3D graphics for the web. Available at:
https://developer.mozilla.org/en-US/docs/Web/API/WebGL_API. [Last Accessed 29th January 2018], [online].

manu.ninja (2016) WebGL 3D Model Viewer Using three.js. Available at: <https://manu.ninja/webgl-3d-model-viewer-using-three-js/#scene>. [Last Accessed 23rd March 2018], [online].

mrdoob (2018) misc_controls_orbit.html. GitHub. mrdoob. Available at:
https://github.com/mrdoob/three.js/blob/master/examples/misc_controls_orbit.html. [Last Accessed 23rd March 2018], [online].

mrdoob (2018) webgl_loader_obj.html. GitHub. Mrdoob. Available at:
https://github.com/mrdoob/three.js/blob/master/examples/webgl_loader_obj.html. [Last Accessed 23rd March 2018], [online].

NkModel3d (2012) Dining Table New Smart. TURBOSQUID. NkModel3d. Available at:
<https://www.turbosquid.com/3d-models/dining-table-max-free/657664>. [Last Accessed 27th March 2018], [online].

Noah Paessel (2016) *ThreeJS OBJ loading & material painting #1*. Available at:
https://www.youtube.com/watch?v=KHZy6X_2RZA. [Last Accessed 23rd March 2018], [online].

Noah Paessel (2016) *ThreeJS OBJ loading & material painting #2*. Available at:
<https://www.youtube.com/watch?v=kTr0J6TqZd8>. [Last Accessed 23rd March 2018], [online].

O'Reilly (n.d.) Programming 3D Applications in HTML5 and WebGL. Available at:
<https://player.oreilly.com/videos/9781491907467>. [Last Accessed 29th January 2018], [online].

chesterd (2011) Working example of WebGLRenderer using existing canvas/div. *Issues*. July 14. Available at: <https://github.com/mrdoob/three.js/issues/352>. [Last Accessed 23rd March 2018], [online].

PlayCanvas (n.d.) Beautiful interactive experiences for every platform. Available at:
<https://playcanvas.com/>. [Last Accessed 29th January 2018], [online].

Programiz (n.d.) Flowchart in Programming. Available at:
<https://www.programiz.com/article/flowchart-programming>. [Last Accessed 22nd March 2018], [online].

Quora (n.d.) What is a good way to put ThreeJS into a Div?. *Web Development*. Available at: <https://www.quora.com/What-is-a-good-way-to-put-ThreeJS-into-a-Div>. [Last Accessed 23rd March 2018], [online].

Ross, C. (2014) Understanding Weaving: What are Looms?. *LinkedIn*. Available at: <https://www.linkedin.com/pulse/20141030195455-49457671-understanding-weaving-what-are-loom>. [Last Accessed 22nd March 2018], [online].

Sadoglu, M. (2015) HTML5 yenilikler ve değişiklikler. September 27. Available at: <http://www.dahiweb.com/html5-yenilikler/>. [Last Accessed 29th January 2018], [online].

Signalchecker.co.uk (n.d.) Check the mobile signal for all UK networks with just one search. Available at: <http://www.signalchecker.co.uk/whitchurch-hampshire>. [Last Accessed 22nd March 2018], [online].

smartdraw (1994) Flowchart Symbols. Available at: <https://www.smartdraw.com/flowchart/flowchart-symbols.htm>. [Last Accessed 22nd March 2018], [online].

softonic.com (1997) Three.js. Available at: <https://three.js.en.softonic.com/>. [Last Accessed 22nd March 2018], [online].

Sonar Systems (2017) *Three.js Tutorial 7 - Model Loading*. Available at: <https://www.youtube.com/watch?v=vqmmXe21TbU>. [Last Accessed 27th March 2018], [online].

StackOverflow (2017) Can't render obj using objloader.js. Available at: <https://stackoverflow.com/questions/43621096/cant-render-obj-using-objloader-js>. [Last Accessed 23rd March 2018], [online].

StackOverflow (2013) Changing three.js background to transparent or other color. Available at: <https://stackoverflow.com/questions/16177056/changing-three-js-background-to-transparent-or-other-color>. [Last Accessed 23rd March 2018], [online].

StackOverflow (2011) CSS for placeholder box (design-time WYSIWYG). Available at: <https://stackoverflow.com/questions/4765340/css-for-placeholder-box-design-time-wysiwyg>. [Last Accessed 15th March 2018], [online].

Stack Overflow (2013) How do you resize a canvas without flicker?. Available at: <https://stackoverflow.com/questions/17779134/how-do-you-resize-a-canvas-without-flicker>. [Last Accessed 29th March 2018], [online].

StackOverflow (2011) How can I create and style a div using JavaScript?. Available at: <https://stackoverflow.com/questions/6840326/how-can-i-create-and-style-a-div-using-javascript>. [Last Accessed 23rd March 2018], [online].

StackOverflow (2010) How to close current tab in a browser window?. Available at: <https://stackoverflow.com/questions/2076299/how-to-close-current-tab-in-a-browser-window>. [Last Accessed 22nd March 2018], [online].

StackOverflow (2012) Positioning the three.js container as an html div. Available at: <https://stackoverflow.com/questions/12583528/positioning-the-three-js-container-as-an-html-div>. [Last Accessed 23rd March 2018], [online].

StackOverflow (2013) *renderer.setSize* calculation by percent of screen? (Three.js). Available at: <https://stackoverflow.com/questions/19827030/renderer-setsize-calculation-by-percent-of-screen-three-js>. [Last Accessed 23rd March 2018], [online].

StackOverflow (2012) render OBJ file using THREE.OBJLoader. Available at: <https://stackoverflow.com/questions/10888479/render-obj-file-using-three-objloader>. [Last Accessed 23rd March 2018], [online].

StackOverflow (2016) three.js – How to toggle camera position if mouse is clicked?. Available at: <https://stackoverflow.com/questions/40187942/three-js-how-to-toggle-camera-position-if-mouse-is-clicked>. [Last Accessed 23rd March 2018], [online].

StackOverflow (2016) Three.js mouse events with raycasting and intersect testing. Available at: <https://stackoverflow.com/questions/40566045/three-js-mouse-events-with-raycasting-and-intersect-testing>. [Last Accessed 23rd March 2018], [online].

Stack Overflow (2013) Transparent background with three.js. Available at: <https://stackoverflow.com/questions/20495302/transparent-background-with-three-js>. [Last Accessed 27th March 2018], [online].

uSwitch (2018) Broadband in Whitchurch. Available at: <https://www.uswitch.com/broadband/local/whitchurch/?postcode=RG287AL>. [Last Accessed 22nd March 2018], [online].

Taplis, S. (2018). April 2014. [online] [Whitchurchsilkmill.org.uk](http://whitchurchsilkmill.org.uk). Available at: <http://whitchurchsilkmill.org.uk/mill/index.php/your-pictures/126-april-2014> [Accessed 2 Feb. 2018].

Textile School (2018) Parts of Weaving Loom. *Fabric*. March 13. Available at: <https://www.textileschool.com/463/parts-of-weaving-loom/>. [Last Accessed 27th March 2018], [online].

three.js.org (n.d.) Creating a scene. Available at: <https://threejs.org/docs/index.html#manual/introduction/Creating-a-scene>. [Last Accessed 22nd March 2018], [online].

three.js.org (n.d.) featured projects. Available at: <https://threejs.org/>. [Last Accessed 22nd March 2018], [online].

three.js.org (n.d.) OBJLoader. Available at: <https://threejs.org/docs/#examples/loaders/OBJLoader>. [Last Accessed 23rd March 2018], [online].

three.js.org (n.d.) OBJLoader. Available at: <https://threejs.org/docs/index.html#examples/loaders/OBJLoader>. [Last Accessed 27th March 2018], [online].

three.js.org (n.d.) OrbitControls. Available at: <https://threejs.org/docs/#examples/controls/OrbitControls>. [Last Accessed 23rd March 2018], [online].

three.js.org (n.d.) three.js – OBJLoader test. Available at: https://threejs.org/examples/#webgl_loader_obj. [Last Accessed 23rd March 2018], [online].

TRISTANGEMUS (2017) Load a 3D Model Using the Three.js OBJ Loader. September 30. Available at: <https://www.learnthreejs.com/load-3d-model-using-three-js-obj-loader/>. [Last Accessed 23rd March 2018], [online].

TURBOSQUID (2018) 3D Models for Professionals. Available at: <https://www.turbosquid.com/>. [Last Accessed 23rd March 2018], [online].

Umpleby, Z. (2018) Presentation Notes to University of Winchester. 23 January.

Unity | Documentation (2017) Building and running a WebGL project. Available at: <https://docs.unity3d.com/Manual/webgl-building.html>. [Last Accessed 27th March 2018], [online].

W3C (2016) Accessibility, Usability, and Inclusion: Related Aspects of a Web for All. Available at: <https://www.w3.org/WAI/intro/usable>. [Last Accessed 2nd February 2018], [online].

W3C (n.d.) Quick Table of Contents. Available at: <http://www.w3.org/TR/2006/WD-WCAG20-20060427/appendixB.html>. [Last Accessed 2nd February 2018], [online].

w3schools (1999) Responsive Web Design – The Viewport. Available at: https://www.w3schools.com/css/css_rwd_viewport.asp. [Last Accessed 15th March 2018].

W3Schools (1999) Responsive Web Design Grid. Available at: https://www.w3schools.com/css/css_rwd_grid.asp. [Last Accessed 22nd March 2018], [online].

W3Schools (1999) Responsive Web Design - Media Queries. Available at: https://www.w3schools.com/css/css_rwd_mediaqueries.asp. [Last Accessed 23rd March 2018], [online].

W3Schools (1999) HTML Color Picker. Available at: http://www.w3schools.com/colors/colors_picker.asp. [Last Accessed 23rd March 2018], [online].

W3Schools (1999) HTML DOM getElementById() Method. Available at: https://www.w3schools.com/jsref/met_document_getelementbyid.asp. [Last Accessed 27th March 2018], [online].

W3Schools (1999) HTML <iframe> Tag. Available at: https://www.w3schools.com/tags/tag_iframe.asp. [Last Accessed 27th March 2018], [online].

w3schools (1999) HTML alt Attribute. Available at: https://www.w3schools.com/tags/att_img_alt.asp. [Last Accessed 15th March 2018], [online].

W3Schools (1999) How TO - Responsive Top Navigation. Available at: https://www.w3schools.com/howto/howto_js_topnav_responsive.asp. [Last Accessed 23rd March 2018], [online].

W3Schools (1999) How TO - Fixed Menu. Available at: https://www.w3schools.com/howto/howto_css_fixed_menu.asp. [Last Accessed 23rd March 2018], [online].

W3Schools (1999) How TO – Toggle Hide and Show. Available at: https://www.w3schools.com/howto/howto_js_toggle_hide_show.asp. [Last Accessed 27th March 2018], [online].

W3Schools (1999) onclick Event. Available at: https://www.w3schools.com/jsref/event_onclick.asp. [Last Accessed 27th March 2018], [online].

W3Schools (1999) W3Schools Online Web Tutorials. Available at: <http://www.w3schools.com/>. [Last Accessed 23rd March 2018], [online].

Webdeveloper.com (2011) Line Break
 not working. *HTML Discussion & Support*. December 28. Available at: <http://www.webdeveloper.com/forum/showthread.php?255163-Line-break-lt-br-gt-not-working>. [Last Accessed 22nd March 2018], [online].

West, M. (n.d.) Getting Started With The Canvas API. *treehouse*. Available at: <http://blog.teamtreehouse.com/getting-started-with-the-canvas-api>. [Last Accessed 29th January 2018], [online].

Whitchurch Silk Mill (2018) Briefs to University of Winchester. 16 January.

Whitchurch Silk Mill (2011) Whitchurch Silk Mill. Available at: <http://whitchurchsilkmill.org.uk/mill/index.php>. [Last Accessed 22nd March 2018], [online].

wikiHow (2017) How to Display 3D Object Interactive Models on a Webpage. *Creating and Enhancing a Website*. Available at: <https://www.wikihow.com/Display-3D-Object-Interactive-Models-on-a-Webpage>. [Last Accessed 1st April 2018], [online].

Wikipedia (2018) WebGL. Available at: <https://en.wikipedia.org/wiki/WebGL>. [Last Accessed 29th January 2018], [online].

WordPress.org (n.d.) Installing WordPress Locally on your Mac with MAMP. Available at: https://codex.wordpress.org/Installing_WordPress_Locally_on_Your_Mac_With_MAMP. [Last Accessed 1st February 2018], [online].

Wort, K. (2018) Research Focus Y2 S2 Case Study. [PDF], [Last Accessed 2nd February 2018].

xSaucecode (2016) *Learning three.js 05 :: Model & Material loading (OBJ/MTL)*. Available at: <https://www.youtube.com/watch?v=q2dhg1e8kpw>. [Last Accessed 23rd March 2018], [online].

Some of the code was provided by the other developer with regards to styling areas such as a couple of the buttons

The final 3D model included in my contribution before sending to the developer was provided by one of the designers

Some comments in the code aren't mine but are those that had come with the code used from other sources

THIS IS THE END OF THE DOCUMENT