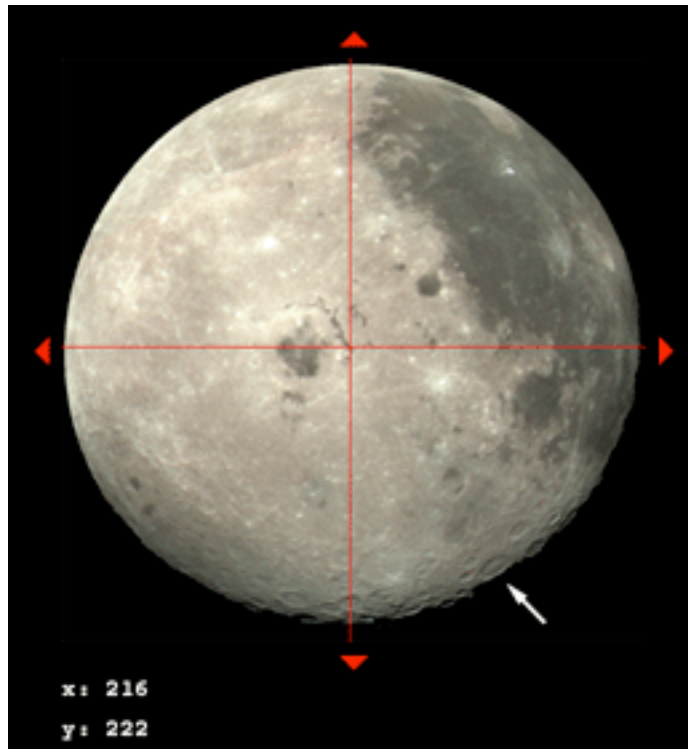


## moon.html -- Using Javascript for Student Interaction



This short module uses the same **Image\_and\_cursor** applet as **bryce.html** and adds some interactivity using forms and Javascript. The code below shows how the applet is placed in the html page. Note the differences between this page and **bryce.html**.

```
<applet code="Image_and_cursor.class"
  width = 518      height = 558>
  <param name = "backdrop_file" value = "smallmoon.gif">

  <param name = "cursor_red" value = "255">
  <param name = "cursor_green" value = "0">
  <param name = "cursor_blue" value = "0">
  <param name = "cursor_x" value = "216">
  <param name = "cursor_y" value = "216">

  <param name = "controls_red" value = "255">
  <param name = "controls_green" value = "255">
  <param name = "controls_blue" value = "255">

  <param name = "back_red" value = "0">
  <param name = "back_green" value = "0">
  <param name = "back_blue" value = "0">

  <param name = "image_width" value = "438">
  <param name = "image_height" value = "438">
```

```
<param name = "font_size" value = "18">
  <param name = "color_sw" value = "0">
</applet>
```

Besides changing the parameters associated with the image, we have changed the colors of the crosshairs, the arrows, and the background.

This module is intended to stimulate students to think about how the appearance of a crater on the moon is affected by the angle at which it is viewed. The module begins with an image of the moon on which one crater is indicated by an arrow. Students are asked to determine the size of that crater. They are given the length of the diameter of the moon from which they can determine the scale of the picture. They are asked to describe the size of the crater, which is roughly elliptical (or circular), in terms of the length of its major and minor axes. The form at the bottom of the page provides spaces to fill in the requested information.

**Major axis:**

**Minor axis:**

Explain how you arrived at your answer here.

**Name:**

The code producing this form is shown below.

```
<form name = "response">
<p><center>
<b>Major axis: </b><input type="textfield" cols = "15"
  name = "major_axis" value = "Enter major axis here.">
</center></p>
```

```

<p><center>
<b>Minor axis: </b><input type="textfield" cols = "15"
  name = "minor_axis" value = "Enter minor axis here.">
</center></p>

<p><center>
<textarea name = "explanation" rows = "20" cols = "150">
Explain how you arrived at your answer here.
</textarea>
</center></p>

<p><center>
<b>Name: </b><input type = "textfield" cols = "100" name = "name"
value = "Type your name here.      ">
</center></p>

<p>&nbsp;</p>

<p><center>
<input type = "button" value = "Submit" onclick = "respond()">
</center></p>

</form>

```

This code illustrates three different kinds of user input.

### **Textfield:**

The code

```

<p><center>
<b>Major axis: </b><input type="textfield" cols = "15"
  name = "major_axis" value = "Enter major axis here.">
</center></p>

```

shows how a **textfield** may be used for short answers.

### **Textarea:**

The code

```

<p><center>
<textarea name = "explanation" rows = "20" cols = "150">
Explain how you arrived at your answer here.
</textarea>
</center></p>

```

shows how a **textarea** may be used for longer, more free form responses.

## **Button:**

The code

```
<p><center>  
<input type = "button" value = "Submit" onclick = "respond()">  
</center></p>
```

shows how to include a **button** in a form. When the student presses this button the Javascript function **respond()** processes the student's responses. This function is shown below.

```
<html>  
<head>  
<script language="JavaScript">  
function respond()  
{  
    var major_axis = document.response.major_axis.value  
    var minor_axis = document.response.minor_axis.value  
    var explanation = document.response.explanation.value  
    var name = document.response.name.value  
  
    document.writeln("<html><head><title>Acknowledgement</title>")  
    document.writeln("</head><body>")  
    document.writeln("<p><center><b>Information Received</b></center></p><p>")  
    document.write("<b>Name: </b>")  
    document.writeln(name)  
    document.writeln("<br>")  
    document.write("<b>Major Axis: </b>")  
    document.write(major_axis)  
    document.writeln("<br>")  
    document.write("<b>Minor Axis: </b>")  
    document.write(minor_axis)  
    document.writeln("</p>")  
    document.write("<p><b>Explanation: </b>")  
    document.write(explanation)  
    document.writeln("</p>")  
    if (Math.abs(210 - major_axis)/210 > 0.50)  
    {  
        document.writeln("<p><b>Your estimate of the length of the major axis ")  
        document.writeln("is not in the ballpark. Please click the button")  
        document.write("below to return to the question and try again.")  
        document.writeln("</b></p>")  
        document.write("<p><center><a href = 'moon.html'>")  
        document.writeln("[return to question.]</a></center></p>")  
        document.writeln("</body></html>")  
    }  
    else  
    {  
        document.writeln("<p><b>Your answer has been accepted.</b></p>")  
        if (Math.abs(major_axis - minor_axis)/major_axis > 0.15)
```

```

    {
      document.writeln("<p>Why do you think this crater is not circular?")
      document.write("Be prepared to talk about this in class tomorrow.")
      document.writeln("</p>")
    }
    document.write("<p><center><a href = 'moon.html'>")
    document.write("[return to question.]</a></center></p>")
    document.writeln("</font></body></html>")
  }
}
</script>

```

The first few lines of the function **respond()** show extract the student's input from the form.

```

var major_axis = document.response.major_axis.value
var minor_axis = document.response.minor_axis.value
var explanation = document.response.explanation.value
var name       = document.response.name.value

```

The next two lines

```

document.writeln("<html><head><title>Acknowledgement</title>")
document.writeln("</head><body>")

```

begin to write a new html page. The functions **document.writeln** and **document.write** write information to a new html page. The difference between them is whether an end-of-line character is written or not. If you look at the long series of **document.write** and **document.writeln** statements, you will see that they are writing the same information that you would normally type into an html file. Some of these lines are writing predetermined strings -- for example, the line

```
document.writeln("<html><head><title>Acknowledgement</title>")
```

always writes `<html><head><title>Acknowledgement</title>` to begin the new html page.

Other lines write information that depends on what the student has done -- for example, the line

```
document.writeln(name)
```

writes the name entered by the student. Note that this name was extracted from the form by the line

```
var name = document.response.name.value
```

Some of the code generates different responses depending on the student's entries. See, for example, the code below.

```

if (Math.abs(210 - major_axis)/210 > 0.50)
{
  document.writeln("<p><b>Your estimate of the length of the major axis ")
  document.writeln("is not in the ballpark. Please click the button")
  document.write("below to return to the question and try again.")
  document.writeln("</b></p>")
  document.write("<p><center><a href = 'moon.html'>")
  document.writeln("[return to question.]</a></center></p>")
  document.writeln("</body></html>")
}
else
{
  document.writeln("<p><b>Your answer has been accepted.</b></p>")
  if (Math.abs(major_axis - minor_axis)/major_axis > 0.15)
  {
    document.writeln("<p>Why do you think this crater is not circular?")
    document.write("Be prepared to talk about this in class tomorrow.")
    document.writeln("</p>")
  }
}
}

```

JavaScript is, in general, much easier to work with than Java. Several good books are available or you can experiment using this example as a starting point. One tricky point is worth noting. You will often want to write information including the quote mark to a new html page. The obvious code -- for example,

```
document.write("<p><center><a href = \"moon.html\">")
```

won't do what you'd like because the quote mark you want to write is interpreted as the end of the string that you want to write. The way to accomplish what you really want is

```
document.write("<p><center><a href = 'moon.html'>")
```

JavaScript will automatically change the single quotes to the desired double quotes.

This module does not actually send the students' answers to their instructor. There are a number of ways to do this but they are beyond the scope of this module.