GeoGebra – Javascript – Lesson 2

InterActivity – Input and Check Answer

Author: Linda Fahlberg-Stojanovska

Thanks to my friends at the GeoGebra Forum

www.mathcasts.org/mtwiki

math247.pbwiki.com

Key Concepts from GeoGebra

1. Conditional text
2. Text – dynamic position

Key Concepts from HTML

3. Form, Input: passing input to javascript

Key Concepts from Javascript

4. Javascript function
5. Javascript/GeoGebra: document.ggbapplet.getValue(objName)
6. Javascript/GeoGebra: document.ggbapplet.setVisible(objName, "true")

Key Concepts from Mathematics

7. Number Line

Script-o-matic

GeoGebra

1. First adaptations
   a. Open geogebra file with number line from lesson 1: numberline_js.ggb
   b. Open the algebra view (View -> Algebra view) so that we can work.
   c. Double-click on a and change its value to -3.
   d. If desired, change the size of the window to 1024x768 using sizer.
   e. Save AS your file – renaming it numberline_js2.ggb

2. We need a number that will be the student's answer.
   a. Click in the input field.
   b. Type in: a1=-3 and hit enter.

Now, we will want to know if a=a1? We define a variable okAns to check this.

Notes:

i. Technically okAns will be a number. I like Boolean variables (true/false), but they are harder to use with geogebra/javascript so I just use numbers with values 0 (false) and 1 (true).

ii. Both javascript and geogebra have odd conditionals for "equals". I am ALWAYS forgetting and typing just "=" so that neither work. At least geogebra will try and tell you ☺, but javascript just says to itself "don't understand that statement – ignoring it" and your code won't work.

Javascript conditional: if (okAns == 1) { true } (2 equal signs)

GeoGebra conditional: If[okAns ≟ 1 , true , false] (special character ≟)

3. Create okAns.
   a. Click in the input field.
   b. Type or paste in: okAns=If[a1≟ a,1,0] and hit enter.

   So, okAns=1 if a=a1 and okAns=0 if a≠a1.

   The value will automatically change as the user generates a value for a (clicks on New Point) or inputs a value for a1 (clicks on Check Answer).

4. Make dynamic conditional Answer text variable anstext.
   a. In the input field, type or paste in:

      anstext=If[okAns≟1,"Yes, x="+a1, "No, x≠"+a1] and hit enter.

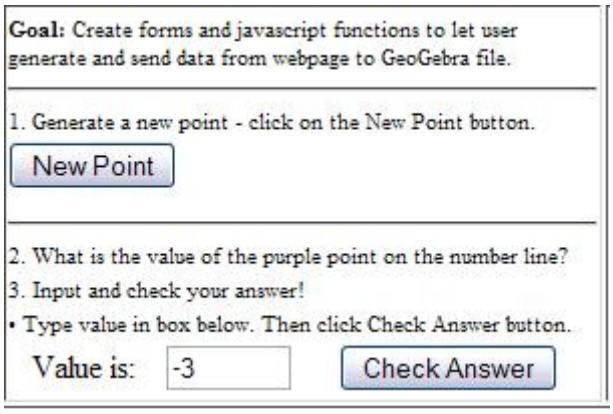
5. Dynamically Position this text
   a. Right-click on text (automatically displayed at (0,0) and choose properties.
   b. Click on the Position tab at top and from the drop down menu, select A. On color tab, change the color. On edit tab, change the size and click on OK.
   c. Click on close.
   d. Select the select icon  and click and drag the text above A.
   e. Right-click and deselect "Show object".

6. Save your geogebra file (as numberline_js2.ggb).

Webpage - html

7. First adaptations – these are standard changes if you re-use your htmls ☺
   a. Open webpage from lesson 1: numberline_js.html
   b. Change webpage title (line 5): …/Javascript 2
   c. Change text in first row of table (line 24):
      GeoGebra/Javascript 2 - Make/Check Point on Number Line
   d. Change for working: 1000->1300 (line 21) and 690->990 (lines 35 and 36)
   e. Change applet call (line 37): numberline_js.ggb -> numberline_js2.ggb
   f. Save AS your file – renaming it numberline_js2.html

8. Appending our instructions.



In place of the 2 empty rows   we will be adding a horizontal line, instruction 2 and instruction 3 (including the bulleted line) and the NEW FORM with 2 inputs – a text input and a button input.

```
<hr>
<p>2. What is the value of the purple point on the number line?</p>
<p>3. Input and check your answer! </p>
<p>&bull; Type value in box below. Then click Check Answer button.</p>
<form>
    
  Value is:
    
  <input name="xval" type="text" size="6" value="-3">
      
  <input name="button" type="button" class="navCurOff" onClick="
checkAnswer(xval.value);" onMouseOver="this.className='navCurOn';"
onMouseOut="this.className='navCurOff';" value=" Check Answer ">
</form>
```

Remember, html does not recognize a new line without a paragraph tag or a break row symbol
. So starting a new line of code does not start a new line of text!

In particular, notice that the entire form is on one line.

Also, html does not recognize more than one blank. So we use   to add additional blanks. The bullet symbol is: •

Javascript

Remember – the student has

- Generated a new point, identified the point, typed his answer in the input box and clicked on Check Answer.

So the function checkAnswer(xval.value) is being called. What should it do?

- Send the input value xval to the ggb file as the number variable a1
  GeoGebra will check whether a1=a and set the value of okAns.
- Get value of okAns from the ggb file and assign it to the variable okAns1 in js.
- If okAns1 = 1 tell the student he is right else tell the student he is wrong.

A possible function is:

```
function checkAnswer(x) {
  document.ggbApplet.evalCommand("a1="+x);
  var okAns1 = document.ggbApplet.getValue("okAns");
  if(okAns1 == 1) {
    alert("You are right!");
  } else {
    alert("You are wrong.");
  }
}
```

Copy and paste this code directly above the </script> tag (line 69), save the html file and open it in your browser. Try correct and incorrect answers and see what happens.

A slightly more sophisticated approach using the text in the ggb file.

```
function checkAnswer(x) {
  document.ggbApplet.evalCommand("a1="+x);
  document.ggbApplet.setVisible("anstext",true);
}
```

Copy and paste this code in place of the previous function.

BUT, to use this, we must turn off the text anstext when a New Point is generated.

So we add the command:

```
document.ggbApplet.setVisible("anstext",false);
```

to the onClick command in the first form and change the " quotes to ' quotes!

So copy this code and paste it in front of "gensetInt" (line 31), change "anstext" to 'anstext', save the html file and open it in your browser. Try it!

9. When you are satisfied that all is working,
   - in GEOGEBRA close the Algebra window and re-save numberline_js2.ggb
   - in text/HTML editor, change 1300->1000 and 990->690 (2 times) and re-save numberline_js2.html.

What the html file looks like in Dreamweaver (color-coded code)

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8">
<title>GeoGebra/Javascript 2 - Number Line</title>
<style type="text/css">
<!-
body
{font-family:Helvetica,sans-serif; margin-left:0px; }
p,ul,ol
{font-size:.7em; margin-top:3px; margin-bottom:3px;}
/* cursor changer for Mozilla Firefox */
.navCurOff
{cursor: default;}
   .navCurOn
{ cursor: pointer;  cursor: hand;}
-->
</style>
</head>
<body>
<table border="1" width="1000">
  <tbody>
    <tr>
      <td colspan="2">GeoGebra/Javascript 2 - Make/Check Point on Number Line  </td>
    </tr>
    <tr>
      <td width="300"><p><b>Goal:</b> Create form and javascript function to let user generate and send data from webpage to GeoGebra file. </p>
        <hr>
        <p>1. Generate a new point - click on the New Point button. </p>
       <form>
          <input name="button" type="button" class="navCurOff" onClick="document.ggbApplet.setVisible('anstext',false);gensetInt('a',10);" onMouseOver="this.className='navCurOn';" onMouseOut="this.className='navCurOff';" value="New Point">
        </form>
        <hr>
        <p>2. What is the value of the purple point on the number line?</p>
        <p>3. Input and check your answer! </p>
        <p>&bull; Type value in box below. Then click Check Answer button.</p>
        <form>
             
           Value is:
             
    <input name="xval" type="text" size="6" value="-3">
               
    <input name="button" type="button" class="navCurOff" onClick=" checkAnswer(xval.value);" onMouseOver="this.className='navCurOn';" onMouseOut="this.className='navCurOff';" value=" Check Answer ">
       </form>
</td>
      <td width="690">
      <applet name="ggbApplet" code="geogebra.GeoGebraApplet" codebase="./" archive="http://www.geogebra.org/webstart/geogebra.jar" height="150" width="690">
          <param name="filename" value="numberline_js2.ggb">
          <param name="showAlgebraInput" value="false">
          <param name="showMenuBar" value="false">
          <param name="showToolBar" value="false">
          <param name="showResetIcon" value="true">
          Sorry, the GeoGebra Applet could not be started. Please make sure that Java 1.4.2 (or later) is installed and activated. (<a href="http://java.sun.com/getjava">click here to install Java now</a>)
        </applet></td>
    </tr>
  </tbody>
</table>
<script type="text/javascript">
//
function gensetInt(objName,rang) {
    // generates random plus and minus sign
  var sgn1 = 2*Math.floor(Math.random()*2)-1;
    // generates random integer between 1 and rang - use floor to get 0 to rang-1
  var n1 = Math.ceil(Math.random()*rang);
  var z=sgn1*n1;
  document.ggbApplet.evalCommand(objName + " = " + z);
}
//
function checkAnswer(x){
  document.ggbApplet.evalCommand("a1="+x);
  document.ggbApplet.setVisible("anstext",true);
}
//
</script>
</body>
</html>

```