

# 1 Javascript Turtle Graphics

## 2 The Concept

3 Learn Javascript programming in a graphics environment. Javascript provides action and  
4 functionality to web pages. The Javascript Turtle Graphics page at <http://bonner-carlson.net/turtle> is  
5 written in Javascript and it provides an environment for exploring Javascript and its use of graphics  
6 using traditional turtle graphics functions.

## 7 The Code

```
8 // first program
9 write ("Hello World")
10
11 // first readable program
12 turn (90)
13 write ("Hello World")
14
15 // simple square function
16 function square4 () {
17     forward (100)
18     right(90)
19     forward (100)
20     right (90)
21     forward (100)
22     right (90)
23     forward (100)
24     right (90)
25 }
26
27
28 // square with repeat
29 function el () {
30     forward (100)
31     right (90)
32 }
33
34 function square () {
35     repeat (4, el)
36 }
37
38
39 //simplest form of while:
40 var i = 0; // initiator
41 while (i<4) { // (condition) {block of instructions}
42     i = i + 1; // incrementer
43 }
44
45
```

```

1 //while form of square
2 var i = 0;
3 while (i<4) {
4     //write (i + " --> ")
5     forward (100)
6     right(90)
7     i = i + 1;
8 }
9
10
11 //functional form of square
12 function square (side) {
13     var i=0
14     while (i<4) {
15         forward( side)
16         right (90)
17         i=i+1
18     }
19 }
20
21
22 function stackedBoxes (number) {
23     var i = 0
24     size = 40
25     while (i <= number) {
26         square( i/number * size )
27         penup()
28         forward( i/number * size)
29         pendown()
30         i = i + 1
31     }
32 }
33
34
35 function squareNumbered (side) {
36     var i=0
37     while (i<4) {
38         if (i%2) {
39             color("red")
40         } else {
41             color ("blue")
42         }
43         write(i) // want to show 100+i and i + "--->" and i + "00"
44         forward( side)
45         right (90)
46         i=i+1
47     }
48 }
49
50
51
52
53

```

```

1  function turningSquare () {
2      var steps = 100
3      var stepSize = 200/steps
4      for (var i=0; i<steps; i=i+1) {
5          square2(stepSize*i);
6          right (360/steps)
7      }
8  }
9
10
11  star....
12  zorro gets back to the same point and same direction ... = 360 degrees
13  360 / 5 = 72... that is a pentagon
14  720 /5 = 240
15
16
17  function spikey (size,n,revs) {
18      var i = 0
19      while (i<n) {
20          forward (size)
21          write (i)
22          right (revs*360/n)
23          i = i + 1
24      }
25  }
26
27  backward (100)
28  spikey(200,5,1) // pentagon
29  //spikey(200,5,2) // star
30  //spikey(200,39,19)
31  //spikey(200,39,19)
32  //spikey(200,45,19)
33  //spikey(200,49,27)
34  //n must be odd
35  //revs is best about rev/2
36
37
38
39
40
41
42  // alternative for an iterating while loop
43  for (var i=0; i<4, i=i+1) {}

```

## What is the Next Step???

- Investigate fractiles and draw them
- Investigate tessellations and draw them
- Do an animated graphics demonstration
- Make the page web accessible
  - add to a server, perhaps on a Raspberry Pi with Apache.
- Learn more about Javascript, HTML, and CSS using resources:
  - Read a book from [it-ebooks.info](http://it-ebooks.info),
  - Take a course from Khan Academy
  - Get hands on experience with Code.org
  - Find a particular feature at W3School
- Learn about code development tools
  - Browser based debugging tools
  - “lint” programs to check CSS and HTML syntax
  - “minify” programs to make your final code smaller

## Possible Careers in Information Technology

- |   |   |
|---|---|
| • help desk / computer support                                  | • web designer (heavy CSS with HTML and Javascript) |
| • system administrator  | • product developer/engineer                        |
| • system analyst  | • software engineer                                 |
| • coder   | • system engineer                                   |
| • front-end web developer (HTML, CSS, Javascript and many more) | • network engineer                                  |
| • back-end web developer (PHP and many more)                    | • protocol engineer                                 |
|   | • engineering management                            |
|   | • chief information office                          |