

Introduction to JavaScript

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Why learn JavaScript

- JavaScript is a scripting language designed for the Web.
- Integrate directly into XHTML documents
- Web page visitors interpret the code when they load the document.
- High levels of interactive web pages.

A Little History

- Originally called LiveScript.
- Invented by Brendan Eich at Netscape in 1995.
- Netscape and Sun Microsystems worked together to include JavaScript in Netscape Navigator 2.0

JavaScript is not Java!

Fundamental Concepts

- Objects
- Instance
- Properties
- Values
- Events and Event Handlers

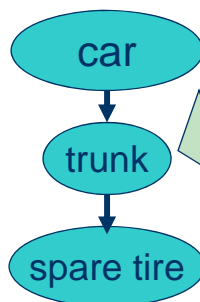
An interactive overview

<http://wps.aw.com/wps/media/objects/58/60015/overview/jsbasics.html>

Objects

JavaScript is an object-oriented language.

- An object is any definable thing.



An object can contain other objects

A hierarchy of objects is represented in code using dot syntax.

`car.trunk.sparetire`

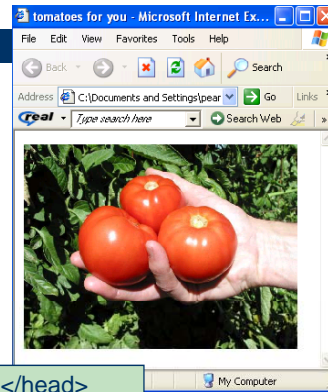


A car is an object in the physical world.

Web browser window, loaded XHTML document, and a picture...

- Think of objects as the nouns of JavaScript language

window.document.tomatoes



```
<html><head><title> tomatoes for you </title></head>
<body bgcolor="white">

</body>
</html>
```

instance



- An instance is one particular incarnation of an object.

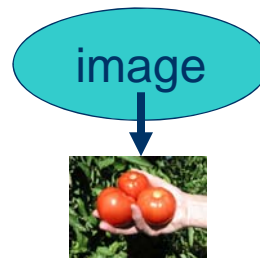
A car is an object, and the Jeep at the meter is one instance of the car object.

An instance of an object inherits all of the characteristics of the object type.

Jeep.trunk.sparetire

Just like the Jeep ...is an instance of a car.

- ...the tomatoes image is an instance of the generic "image object."



properties

- Instances of objects can also have properties.
- An instance of the car might have a property known as color.

Jeep.color

In JavaScript, each object can have many associated properties.

window.document.bgColor

values

Notice that the JavaScript code statements should end with a semicolon. A **statement** is a single command sent to the JS interpreter in the Web browser. The semicolon tells the JS interpreter where the statement ends.

- Properties have values.

```
Jeep.color="yellow";
```

yellow is the **value** that is assigned to the **color** property of the object **Jeep**.

```
window.document.backgroundColor="silver";
```

An object is...

- ...a self-contained piece of functionality that can be easily used, and re-used as the building blocks for a software application.
- Objects consist of data variables and functions (called *methods*) that can be accessed and called on the object to perform tasks.

“hello world”

```
1 <html>
2 <head>
3   <title>My First JavaScript Example</title>
4 </head>
5
6 <body>
7
8 <script type="text/javascript" language="JavaScript">
9   document.writeln( "Hello World" );
10 </script>
11
12 </body>
13
```

on click

```
1 <html>
2 <head>
3   <title>My First JavaScript Example</title>
4 </head>
5
6 <body>
7
8 <script type="text/javascript" language="JavaScript">
9   document.writeln( "Hello World" );
10 </script>
11
12 <form>
13   <input type="button" value="Press me" onClick="alert('Goodbye cruel world')">
14 </form>
15
16 </body>
17 </html>
18
```

<script> ... </script>

```
1 <script type="text/javascript">
2 // JavaScript code goes here
3 </script>
4
```

```
1 <script src="/j-scripts/myjscrip.js" type="text/javascript">
2 </script>
3
```

```
1 document.writeln ("This is contained in an external JavaScript file")
2
```

When to use an external file...

- Inline vs. external
- JavaScript functions should be placed in the external *src* files wherever possible.
- Code used on multiple pages – modify code in one place

Variable definition

```
var myVariable;
```

```
myVariable = 10;
```

```
var myVariable = 10;
```

```
var i, j, k;  
var myValue = 9, myMessage = "Welcome to JavaScript";
```

rollover graphics

- The image changes when the viewer moves the mouse over it.
- ``
- This technique relies on the `src` property of the image object in JavaScript.
- The `src` has the value `"tomatoes.jpg"` which points to an image file called `"tomatoes.jpg"`.
- Another property of the `img` tag is the `name` property; `name="tomatoes"`.



The value assigned to name is tomatoes.

JavaScript lets you...

- ... include code that changes the value of the `SRC` property of an image object and thereby implement the rollover feature.

- This means...
that you can change the image even after the page has been loaded into the browser window.

Events and Event Handlers

- Objects sometimes encounter **events**.
- A car object might encounter the blowout event, resulting in a change in the shape of the tire.

```
onBlowOut=Jeep.tire.shape="flat";
```

- A JS **event handler** is the code that responds to events initiated by visitors to a Web page.

mouseover event

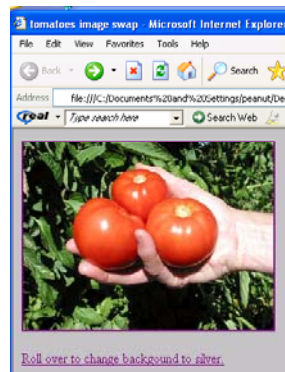
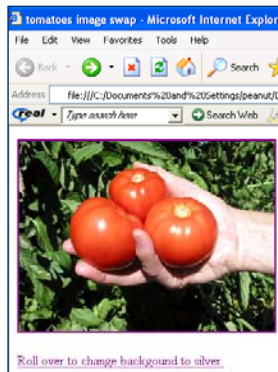
- One of the most common events is the **mouseover** event triggered when a visitor moves the mouse on top of an object.
- The anchor tag <a> can be set to respond to mouseover events.
- Any text or graphics enclosed by an anchor tag can be used to trigger the mouseover event.

onmouseover event example



The href property is set to “#” so that nothing happens if the user clicks the link.

```
<a href="#" onmouseover="document.bgColor='silver';" >  
Roll over to change background to silver. </a>
```



onmouseout event

- The onmouseout event handler restores the original image when the mouse is no longer on top of the image.

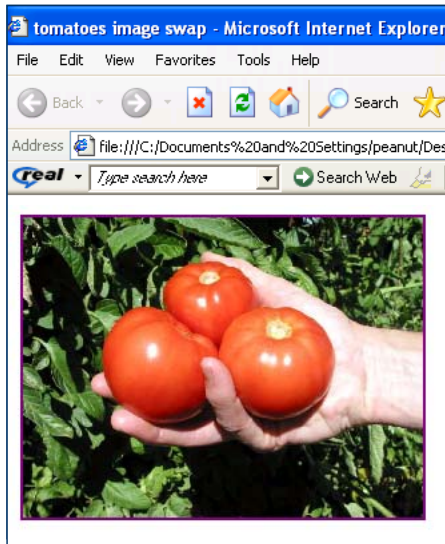
Image swap: use an tag!

```
<a href="#"  
  onmouseover="document.funky.src = 'tomatoes.jpg';"  
  onmouseout="document.funky.src = 'tomatoes-change.jpg';">  
  </a>
```



Be sensitive!

XHTML tags are case sensitive, so is JavaScript!
'document.tomatoes.src' and 'document.Tomatoes.src' are not equivalent.



JavaScript portions of the code listing are in blue!

```
<html><head><title> tomatoes image swap </title></head>
<body bgcolor="white">
<a href="#" onmouseover="document.tomatoes.src = 'tomatoes-change.jpg';"
  onmouseout="document.tomatoes.src = 'tomatoes.jpg';">
  </a>
<p>
<a href="#" onmouseover="document.bgColor='silver';">
  Roll over to change background to silver. </a>
</p>
</body>
</html>
```