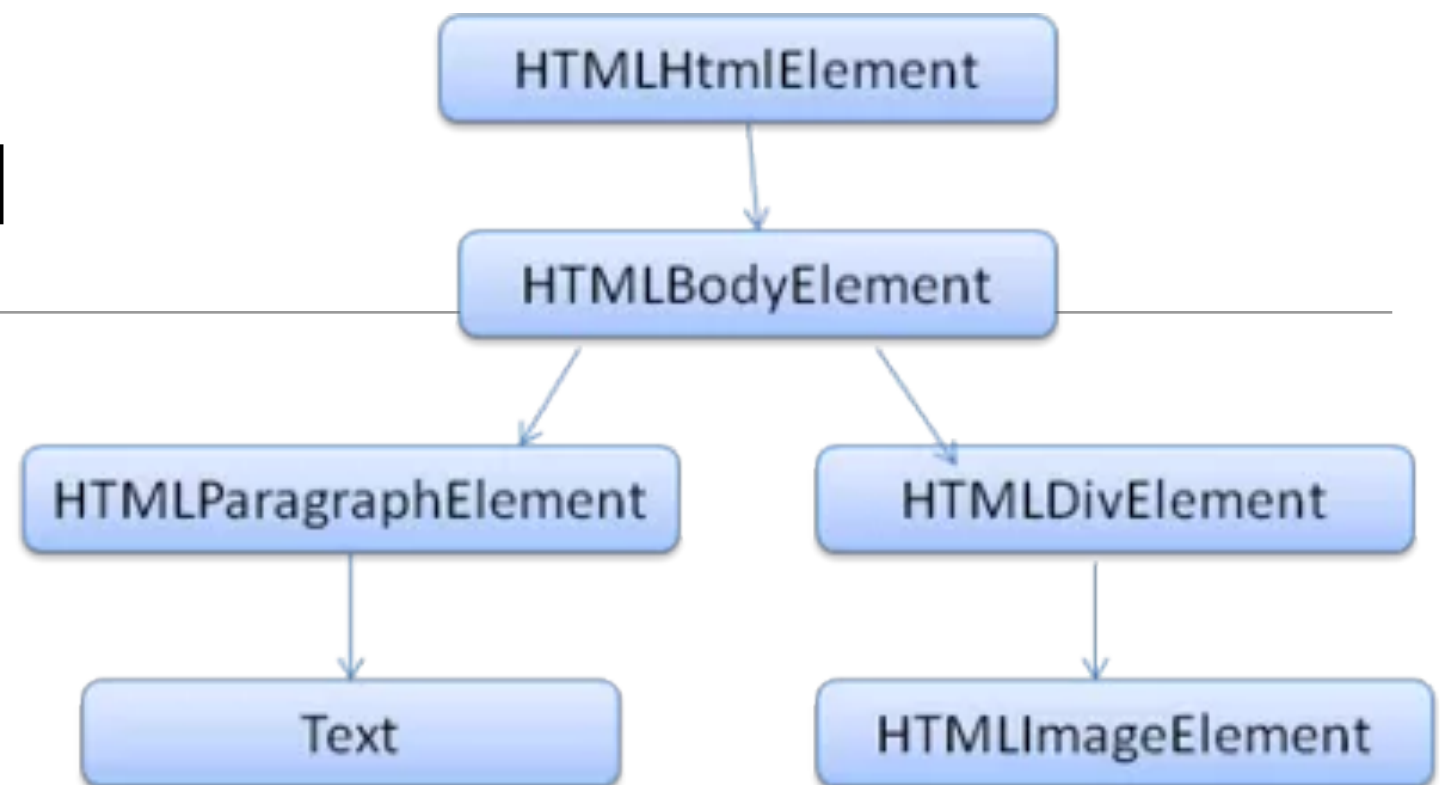


# JavaScript & The DOM

Ynon Perek



# What Browsers Do

## Parse HTML

## To Web Pages

```
<BODY BGCOLOR='#FFFFFF' style="overflow:hidden;"
LEFTMARGIN=0 MARGINWIDTH=0 TOPMARGIN=0
MARGINHEIGHT=0 CLASS="text" onload="DisplayAD();"
onresize="if(typeof DZresize == 'function'){DZresize();};if(typeof
dcOnResize == 'function'){dcOnResize();};if(typeof
disYnetAdColOnResize == 'function'){disYnetAdColOnResize();};"
lang=he><div id='divRedAlert' style='display:none;'></div><iframe
id=frmRedAlert name=frmRedAlert frameborder=0 width=0 height=0
MARGINHEIGHT=0 MARGINWIDTH=0 src='/Ext/App/RedAlert/
CdaRedAlert_iframe/0,12639,84-234-208-20,00.html'></iframe><div
id='ads.ozen' style='position:absolute;z-index:2;left:0;top:0;'></div><div
id='ads.elvisR.1' style='position:absolute;z-index:2;right:0;top:0;'></
div><div id=mainCont style="overflow:hidden; width:100%; height:100%;"
align=center><div id='mainSpacer' style='overflow:auto;height:
100%'><script>
<style>A.brightgrey:link{color:#7d7f7e}
A.brightgrey:visited{color:#7d7f7e}A.brightgrey:active{color:#7d7f7e}
A.brightgrey:hover{color:#f00}A.upnvl{color:#7d7f80}
A.upnvl:visited{color:#7d7f80}A.upnvl:hover{color:#f00}
A.btnvl{color:#7f90b0}A.btnvl:visited{color:#7f90b0}
A.btnvl:hover{color:#f00}</style><table id=tbl_logos cellpadding=0 ceta
width='46' align='left' style='line-height:12px;'><a href='http://
www.ynetnews.com/home/0,7340,L-3083,00.html' class='text11
btnvl'>English</a></td></tr></table></div></td><td width=11>&nbsp;
</td><td width=2 bgcolor=black></td><td width=11>&nbsp;
</td><td width=132 valign=top style='direction: rtl;' class='ghci3'><div
```

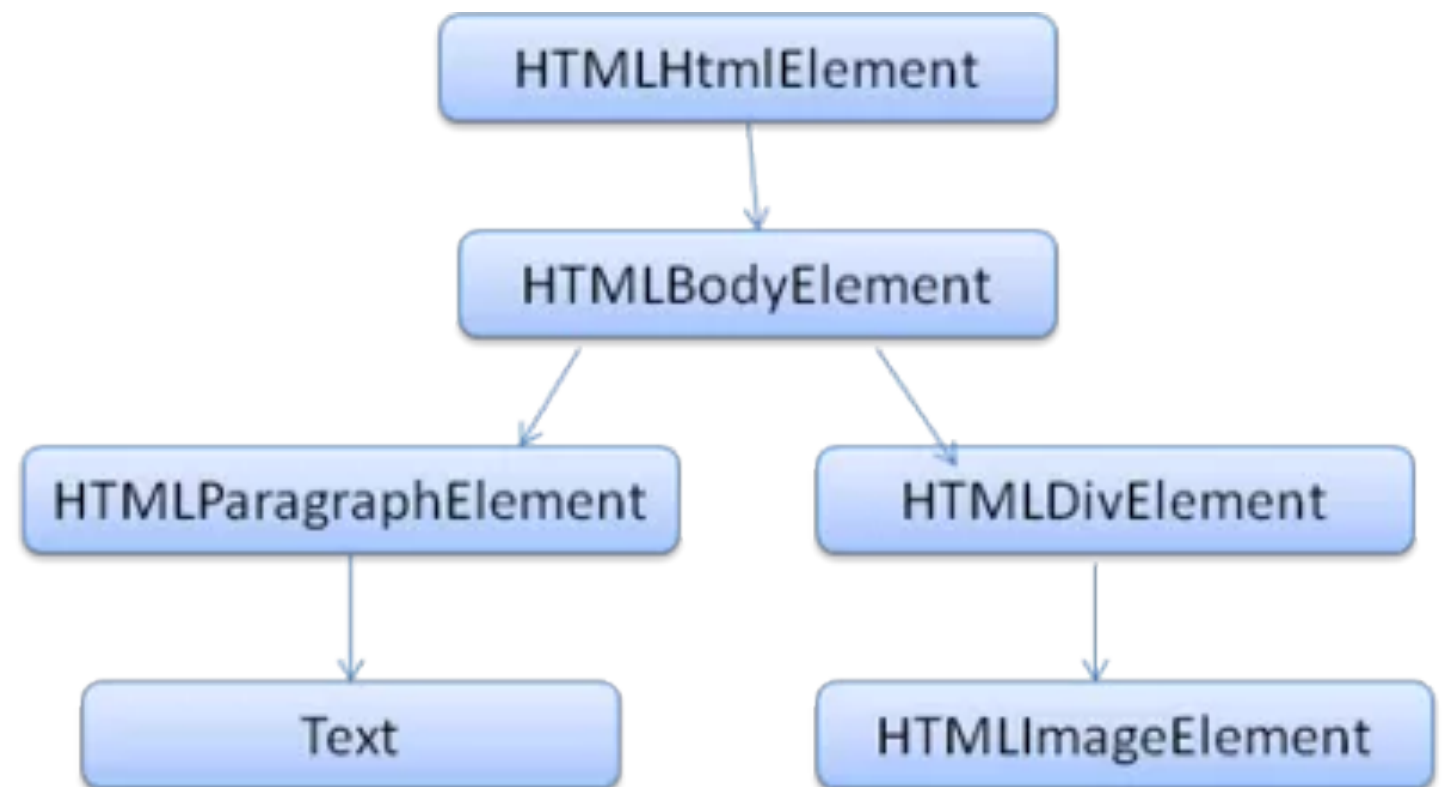


# How They Do It: Document Object Model

---

```
<html>
<body>
  <p>

  </p>
  <div>
    <img src "example.png"/>
  </div>
</body>
</html>
```



# Rendering Engines

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Browser	Vendor	Engine
Google Chrome	Google	Blink
Mozilla Firefox	Mozilla	Gecko
IE	Microsoft	Trident
Apple Safari	Apple, KDE, Nokia, Others	Webkit

# Enter JavaScript

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- JavaScript alters *page load*
- JavaScript alters *DOM Tree*
- JavaScript creates interactivity through *events handling*

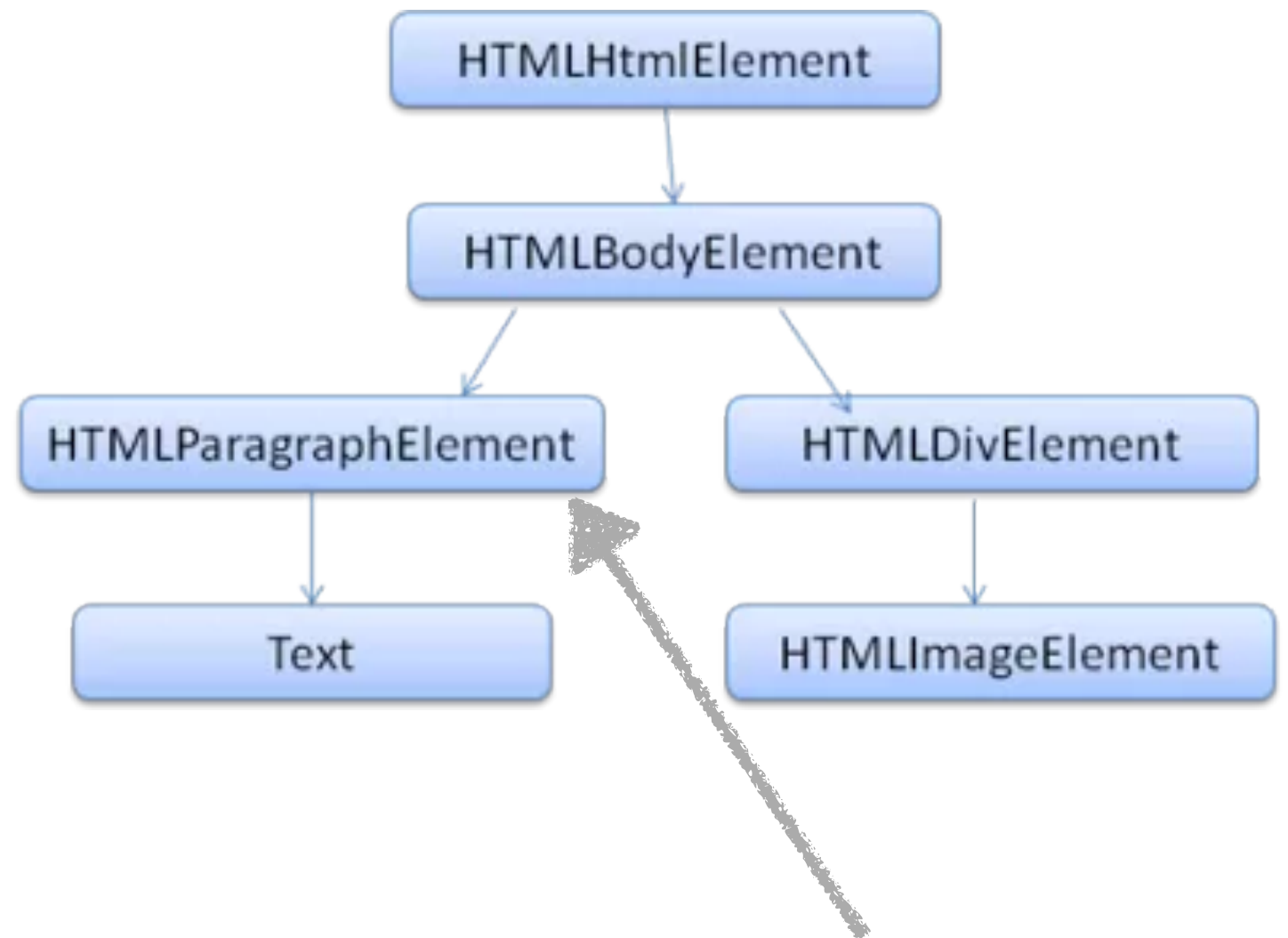
Accessing DOM objects

Manipulate DOM Properties

Event Handling

```
<html>
<body>
  <p>

  </p>
  <div>
    <img src "example.png"/>
  </div>
</body>
</html>
```



`document.querySelector( 'p' )`

# Fetching DOM nodes

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- `document.querySelector(<CSS Selector>)` - returns the first DOM node matching a selector
- `document.querySelectorAll(<CSS Selector>)` - returns an array of all nodes matching a selector
- `document.getElementById(<ID>)` - returns a DOM node with given id
- `document.getElementsByTagName(<name>)` - returns an array of nodes matching given tag name



# What DOM nodes are?

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- Special JS objects
- Their properties represent visual properties of document
- Manipulating their properties affects visible document

Accessing DOM objects

Manipulate DOM Properties

Event Handling

# What's In A DOM Element

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- `classList`
- `style`
- `id`
- `tagName`
- `textContent`
- `innerHTML`
- Full list: <https://developer.mozilla.org/en/docs/Web/API/Element>

# DOM Element Functions

---

- `querySelector(<selector>)`
- `querySelectorAll(<selector>)`
- `closest(<selector>)`
- `getAttribute(<attr>)`, `setAttribute(<attr>, <value>)`
- `remove()`
- Full list: <https://developer.mozilla.org/en/docs/Web/API/Element>

# Demo: Change Background from JS

---

```
var body = document.querySelector( 'body' );  
body.style.backgroundColor = 'orange';
```

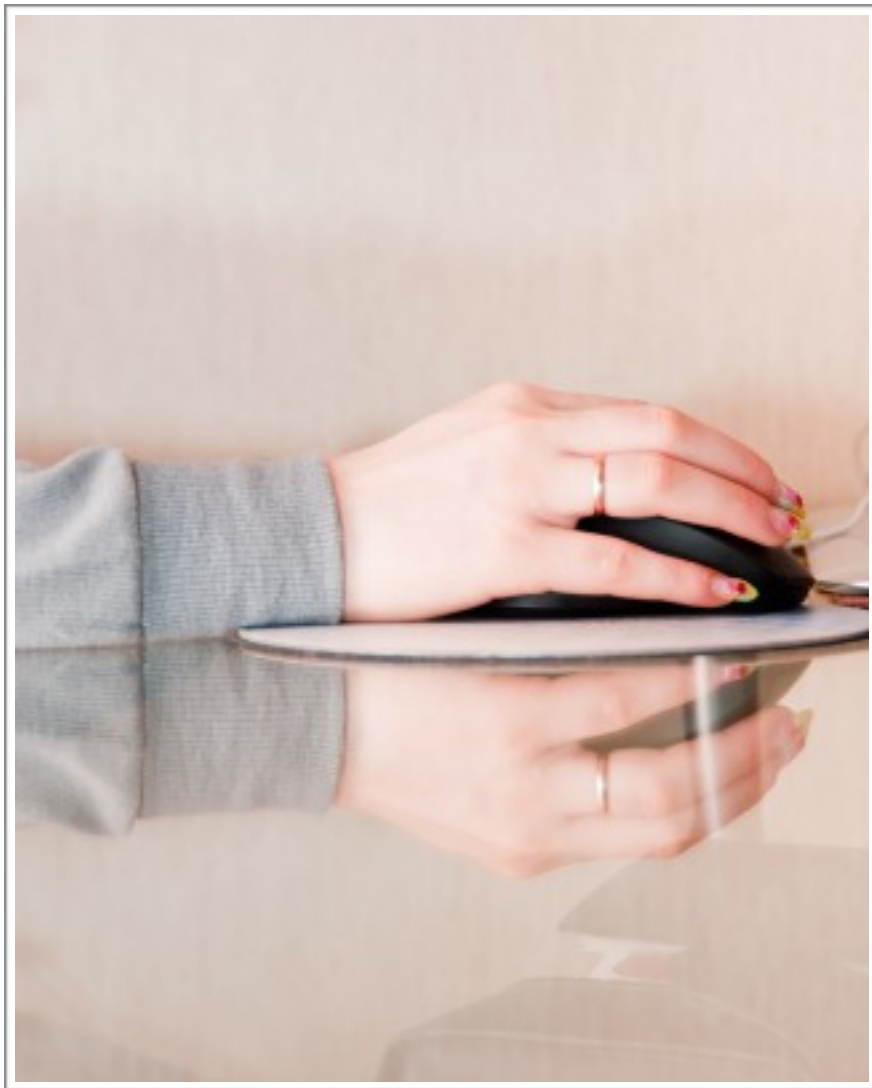
Accessing DOM objects

Manipulate DOM Properties

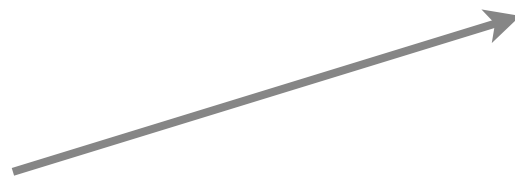
Event Handling

# Browser Events Loop

---

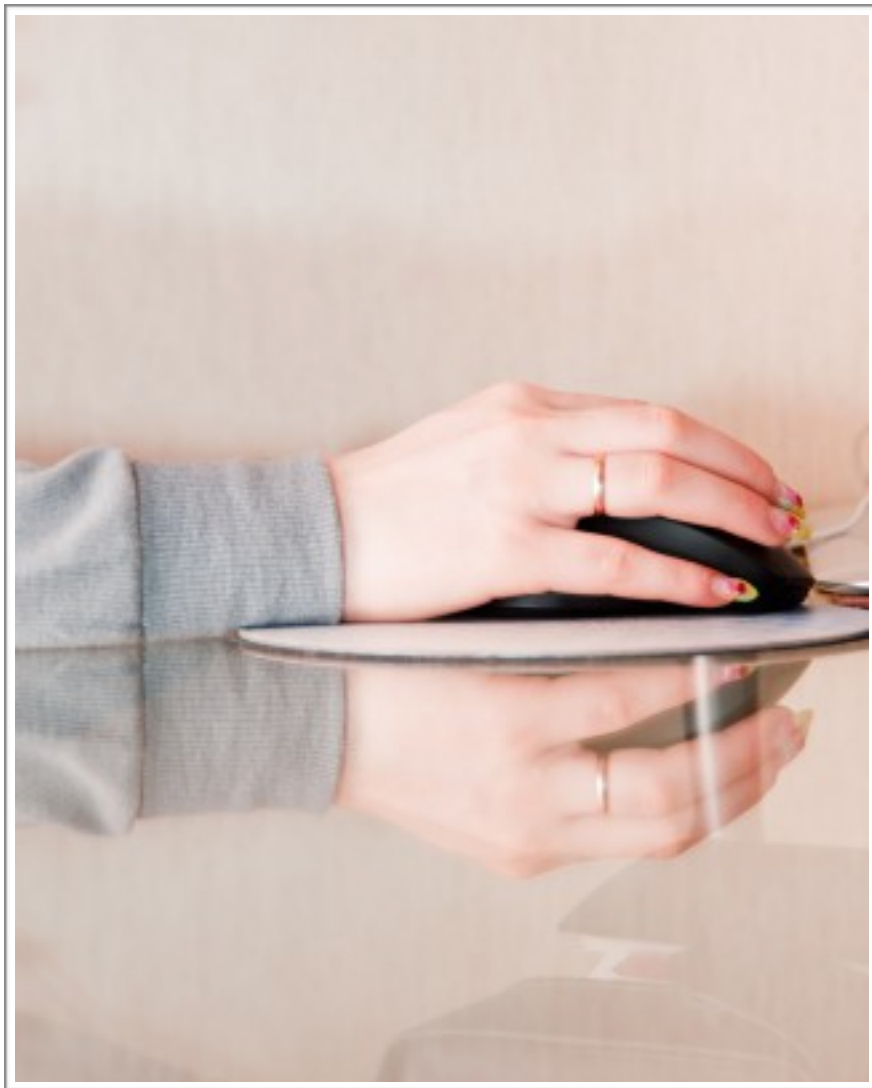


Event Queue



# Browser Events Loop

---



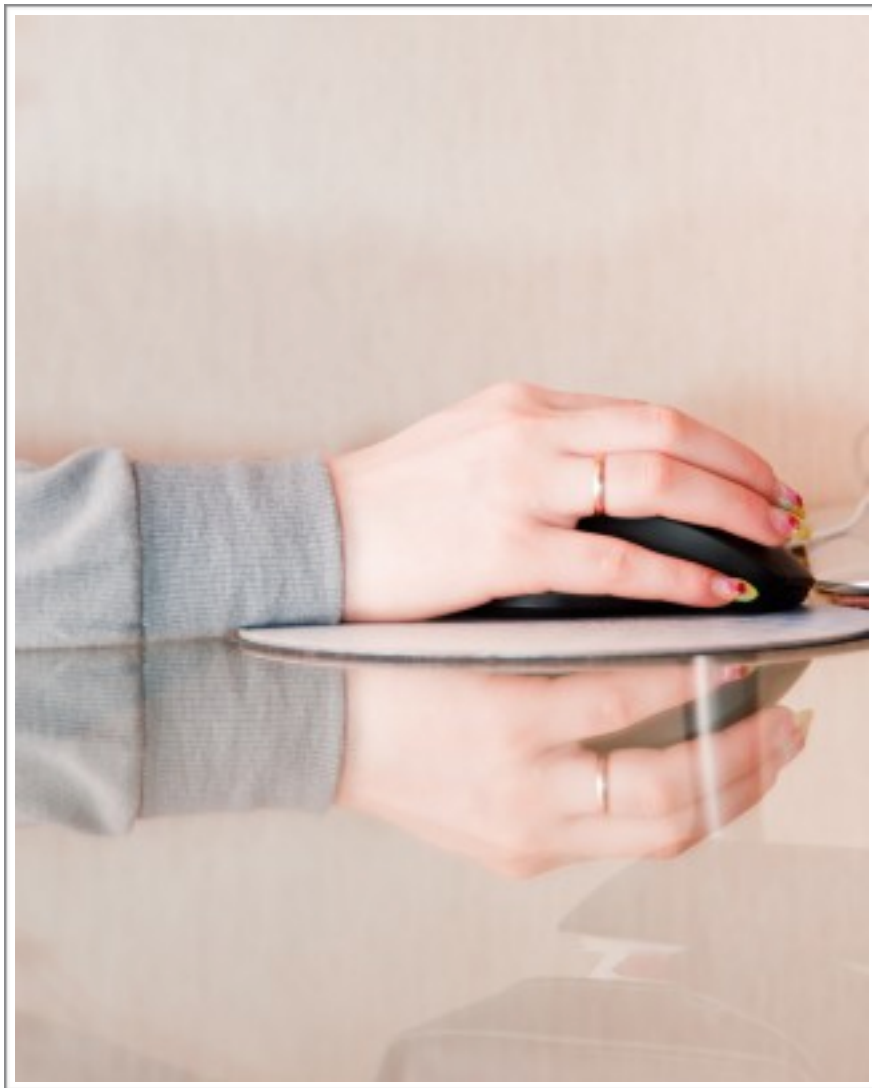
Event Queue

click



# Browser Events Loop

---



Event Queue

click

Event Handlers

# Handling Events

---

- Register event handler on page load
- Wait ...
- When things happen, **browser** will call your event handlers passing event description object

# Event Handlers

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```
function handleClick(ev) {  
    var from = ev.target;  
  
    from.textContent = 'Ouch!';  
}
```

Event Info Spec:

<https://developer.mozilla.org/en-US/docs/Web/API/Event>

# Registering Event Handlers

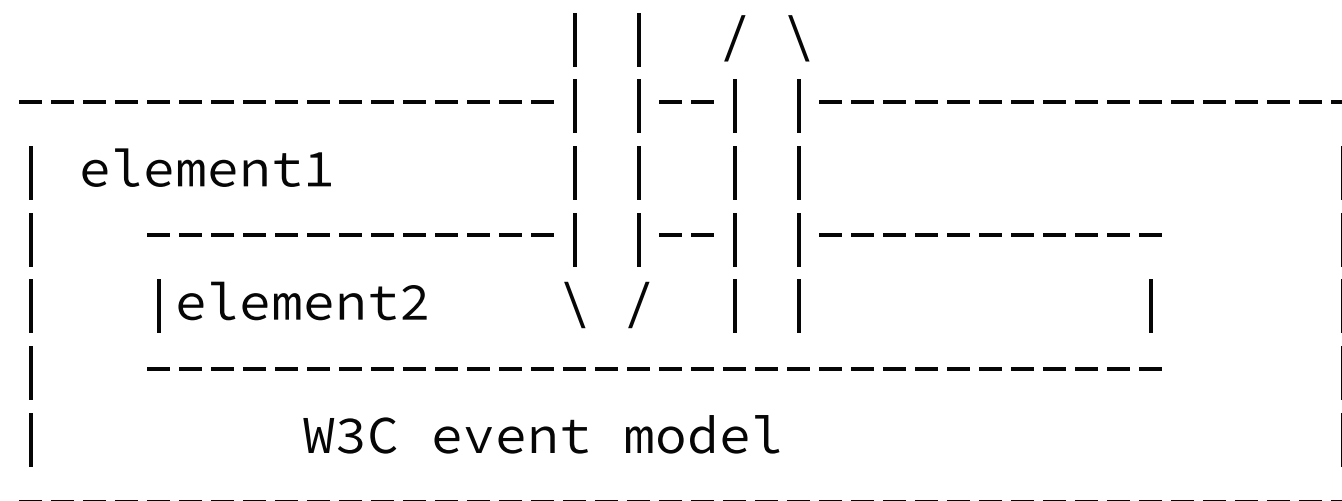
---

- Function `addEventListener(<type>, <fn>)` of DOM element adds an event handler to the element
- Event types: <https://developer.mozilla.org/en-US/docs/Web/Events>

```
var btn = document.querySelector( '#btn-start' );  
btn.addEventListener( 'click', handleClick );
```

# Event Propagation

---



# Default Actions

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- Some events have default actions
- Such as submitting a form, or clicking a button inside a form
- To disable default action use: `ev.preventDefault()`



# jQuery Is:

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- A DOM Manipulation library
- Widely used
- Original goal was to abstract away differences between browsers
- Now it's mostly for comfort



# jQuery Vs. DOM

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- `$(<selector>)` replaces `querySelectorAll`.
- It returns a special jQuery Object that automatically loops over the elements in the group

```
$ ( 'p' )
```

```
document.querySelector( 'p' )
```

# jQuery vs. DOM

---

- Change document background color

```
$ ( 'body' ) .css ( 'backgroundColor', 'orange' );
```

```
var body = document.querySelector ( 'body' );  
body.style.backgroundColor = 'orange';
```

# jQuery vs. DOM

---

- Check class list

```
var $body = $( 'body' );  
if ( $body.hasClass( 'blue' ) ) {  
    // body is blue  
}
```

```
var body = document.querySelector( 'body' );  
if ( body.classList.contains( 'blue' ) ) {  
    // body is blue  
}
```

# jQuery vs. DOM

---

- Class manipulation

```
var $body = $( 'body' );  
$body.addClass( 'blue' );
```

```
var body = document.querySelectorAll( 'body' );  
body.classList.add( 'blue' );
```

# jQuery vs. DOM

---

- Events

```
var $btn = $('#btn-start');  
$btn.on('click', handleClick);
```

```
var $box = $('.box');  
$box.on('click', 'button', handleClick);
```

# Lab

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- Implement a “Catch The Red!” game:
  - Show 10 squares: 9 grey and 1 red
  - When user clicks on the red it changes position AND user gets +5 score
  - When user clicks on a grey everything changed position but no score are given
- Bonus: Shuffle squares and reduce -2 score every 2 seconds of idle time

# Thanks For Listening

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- ❖ Read more: [www.tocode.co.il](http://www.tocode.co.il)
- ❖ Talk to me: [ynon@tocode.co.il](mailto:ynon@tocode.co.il)
- ❖ Photos from: <http://123rf.com>