# Reference tables

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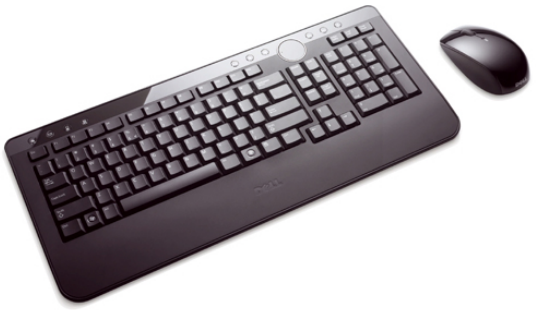
## Quick summary of event management in JavaScript

### HTML5 EVENTS

There is no input or output in JavaScript. We treat *events* caused by user actions as inputs, and we manipulate the DOM structure as output. Usually in a JavaScript application, we will get info such as the key strokes, the mouse button clicks and the mouse position, and we will refer to these variables when determining what action to perform.



In any case, the events are called DOM events, and we use the DOM APIs to create *event handlers*.

### HOW TO LISTEN TO EVENTS

There are three ways to manage events in the DOM structure. You could attach an event inline in your HTML code like this:

#### Method 1: declare an event handler in the HTML code

```
1. <div id="someDiv" onclick="alert('clicked!')"> content of the div </div>
```

This method is very easy to use, but it is not the recommended way to handle events. Indeed, although it currently works, it is *deprecated* (will probably be abandoned in the future). Mixing 'visual layer' (HTML) and 'logic layer' (JavaScript) in one place is really bad practice and causes a host of problems during development.

**Method 2: attach an event handler to an HTML element in JavaScript**

```
1. document.getElementById('someDiv').onclick = function() {
2.    alert('clicked!');
3. }
```

This method is fine, but you will not be able to attach multiple *listener* functions. If you need to do this, use the version shown below.

**Method 3: register a callback to the event listener with the addEventListener method (preferred method)**

```
1. document.getElementById('someDiv').addEventListener('click', function() {
2.    alert('clicked!');
3. }, false);
```

Note that the third parameter describes whether the *callback* has to be called during the captured phase. This is not important for now, just set it to false or ignore it (you can even pass only two parameters to the `addEventListener` function call and do not set this boolean parameter at all).

**Details of the DOM event are passed to the event listener function**

When you create an *event listener* and attach it to an element, the listener will create an `event` *object* to describe what happened. This object is provided as a parameter of the *callback function*:

```
1. element.addEventListener('click', function(event) {
2.    // now you can use event object inside the callback
3. }, false);
```

Depending on the type of event you are listening to, you will consult different properties from the `event` object in order to obtain useful information such as: "which keys are pressed down?", "what is the location of the mouse cursor?", "which mouse button has been clicked?", etc.

In the following lessons, we will remind you how to deal with the keyboard and the mouse.

## Further reading

In Method 1 (above), we mentioned that "mixing 'visual layer' (HTML) and 'logic layer' (JavaScript) ... is bad practice", and this is similarly reflected in many style features being deprecated in HTML5 and moved into CSS3. The management philosophy at play here is called "the separation of concerns" and applies in several ways to software development - at the code level, through to the management of staff. It's not part of the course, but professionals may find the following references useful:

- Separation of concerns - Wikipedia, the free encyclopedia
- Chapter 5. Separation of Concerns from *Programming JavaScript Applications, by Eric Elliott, O'Reilly, 2013.*
- The Art of Separation of Concerns by *derekgreer*, *January 3, 2008*

## Reference tables for events and properties/methods

These tables are provided as a reference. They are a compilation of the most common event types sorted by domain (key, mouse, forms, etc.). For each domain you will see the most useful event types and their properties.

In the following sections, we will show examples that use most of the events displayed in these tables.

### Event object

Most useful common properties:

| | |
|---|---|
| type | Returns the name of the event |
| target | Returns the element that triggered the event |

Most useful common methods:

| | |
|---|---|
| preventDefault() | Cancels the event if it is cancelable, meaning that the default action that belongs to the event will not occur |

| | |
|---|---|
| stopPropagation() | Prevents further propagation of an event during event flow |

## Page

### Events related to the page lifecycle

There are many other events related to the page life cycle. Below are the most useful ones for an intro course:

| | |
|---|---|
| load | This event occurs when an object has loaded (including all its resources: images, etc.) This event is very useful when you want to run JS code and be sure that the DOM is ready (in other words, be sure that a document.getElementById(...) or document.querySelector(...) will not raise an error because the document has not been loaded and elements you are looking for are not ready. |
| resize | The event occurs when the document view is resized. Usually we get the new size of the window inside the event listener using var w = window.innerWidth; and<br>var h = window.innerHeight; |
| scroll | The event occurs when an element's scrollbar is being scrolled. Usually, in the scroll event listener, we use things such as:<br>`var max = document.body.scrollHeight - innerHeight;`<br>`var percent = (pageYOffset / max);`<br>...to know the percentage of the scroll in the page. |

### Page event properties

There are no particular properties that need to be mentioned here. Usually, the `load` event listener corresponds to a JavaScript function that can be seen as "the main" function of your Web Application. It is good practice to start everything after the page has been completely loaded. In the `resize` listener, you get the new size of the window, or the new size of some HTML elements in the page (as they might have been resized too when the window was resized) and then you do something (redraw a graphic in an HTML canvas that takes into account the new canvas size, for example).

### Keyboard

**Event types related to keyboard**

| | |
|---|---|
| keydown | The event occurs when the user is pressing a key |
| keyup | The event occurs when the user releases a key |
| keypress | The event occurs when the user presses a key (up and release) |

**keyboardEvent properties**

| | |
|---|---|
| keyCode | Returns the Unicode character code of the key that triggered the onkeypress ,onkeydown or onkeyup event |
| shiftKey | Returns whether the "shift" key was pressed when the key event was triggered |
| ctrlKey | Returns whether the "ctrl" key was pressed when the key event was triggered |
| altKey | Returns whether the "alt" key was pressed when the key event was triggered |

### Mouse

**Event types related to mouse**

| | |
|---|---|
| click | The event occurs when the user clicks on an element (presses a button and releases it) |

| | |
|---|---|
| dblclick | The event occurs when the user double-clicks on an element |
| mousedown | The event occurs when the user presses a key (up and release) |
| mouseup | The event occurs when a user releases a mouse button over an element |
| mousemove | The event occurs when the pointer is moving while it is over an element |
| mouseenter | The event occurs when the pointer is moved onto an element |
| mouseleave | The event occurs when the pointer is moved out of an element |
| mouseover | The event occurs when the pointer is moved onto an element, or onto one of its children |
| contextmenu | The event occurs when the user right-clicks on an element to open a context menu |

**MouseEvent properties**

| | |
|---|---|
| button | Returns which mouse button was pressed when the mouse event was triggered |
| clientX and clientY | Returns the coordinates of the mouse pointer, relative to the element coordinate system that triggered the event |
| pageX and pageY | Returns the coordinates of the mouse pointer, relative to the document, when the mouse event was triggered |

| | |
|---|---|
| screenX and screenY | Returns the coordinates of the mouse pointer, relative to the screen, when an event was triggered |
| altKey, ctrlKey, shiftKey | Returns whether the "alt, ctrl and shift" key was pressed when an event was triggered |
| detail | Returns a number that indicates how many times the mouse was clicked |

## Forms

### Events related to forms

| | |
|---|---|
| input | The event occurs when an element gets user input (e.g., a key is typed on an input field, a slider is moved, etc.) |
| change | The event occurs when the content of a form element, the selection, or the checked state have changed (for <input>, <select>, and <textarea>). A change event listener on a slider will generate an event when the drag/move ended, while input events will be useful to do something as the slider is being moved. |
| focus | The event occurs when an element gets focus (e.g., the user clicks in an input field) |

| | |
|---|---|
| blur | The event occurs when an element loses focus (e.g., the user clicks on another element) |
| select | The event occurs after the user selects some text (for <input> and <textarea>) |
| submit | The event occurs when a form is submitted |

**FormEvent properties**

There are no particular properties that need to be mentioned here. Usually, on a form event listener, we check the content of the different input fields, using their `value` property. See examples in the course, in the part dealing with form events.

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