

# THE MODERN WEB

MULTI-DEVICE WEB DEVELOPMENT  
WITH *HTML5, CSS3, AND JAVASCRIPT*

PETER GASSTON



# INDEX

## Symbols and Numerals

@import at-rule, 40  
@supports at-rule, 102, 207  
@viewport at-rule, for setting viewport parameter, 49–50  
. (dot) notation, for storing items, 117  
[] (square bracket) notation, for storing items, 117  
3-D axes, 110  
3-D context  
    detecting device position in, 110  
    WebGL for, 138  
3-D orientation, information sources, 124, 222

## A

a element, dragging, 119  
aboutness, 28  
activeElement() attribute, 131  
Adaptive Images tool, 63, 64, 221  
adaptive websites, 39  
    vs. responsive, 53–56  
add() method, 97  
addEventListener method, 91–94  
Adobe, 1, 182, 210, 226  
    Edge Inspect, 19  
    open standards, 200  
agents, detecting dimension, 41  
align-content property, 77  
align-items property, 74  
alignment  
    in Flexbox, 73  
    in grid layout, 83–84  
align-self property, 75  
all media type, for media queries, 44  
all value, for column-span property, 68  
almost standards mode, 15  
alpha property, for orientation, 111  
alt attribute, for picture element, 62  
Amazon Kindle, 6  
*Ambient Findability* (Morville), 38, 219

and operator  
    for feature queries, 207  
    for media queries, 44  
Android, 19  
    browsers, 212  
anonymous functions  
    vs. named functions, 92  
    removing from event handlers, 94  
Apache Cordova, 182  
APIs. *See* device APIs; *specific APIs*  
app object, in manifest file, 180  
AppCache (Application Cache), 178, 185–188  
    caching sequence, 186–187  
    documentation, 189, 225  
.appcache file, 185, 186  
Appcelerator Titanium, 184  
appendChild() method, 193  
Apple, and MP4 format, 166  
Application Cache. *See* AppCache (Application Cache)  
application role, 27  
applications. *See* TV apps; web apps  
arc() method, 136  
Archibald, Jake, 185  
areas in grid, 78, 79  
aria-haspopup attribute, 26  
article element, 22–24  
    width of, 59  
aside element, 22  
aspect ratio  
    of device or viewport, 43  
    maintaining, 60  
assistive technology  
    automatic focus and, 144  
    browser awareness of interactive content, 26  
asynchronous execution of scripts, 90–91  
Atkins, Tab, 85  
audio element, 116, 162–163  
    multiple source files for, 164

- audio format, variation in browser support, 166
  - audio() method, 173
  - AudioContext() method, 174
  - auto value
    - for column-fill property, 67
    - for height property, 60
    - for preload attribute, 163
  - autocomplete attribute for form, 145
  - autofocus attribute for form, 144
  - autoplay attribute, for media elements, 163
  - avoid-column value, for break-before property, 69
  - axes
    - in Flexbox, 73
    - in Orientation API, 110
- B**
- B2B (business-to-business) sites, 2
  - balance value, for column-fill property, 67
  - bandwidth attribute, of connection object, 115
  - banner role, 27
  - baseline value, for align-items property, 74
  - Battery Status API, 114–115
    - information sources, 124, 222
  - battery, vibrating impact on, 113
  - beta property, for orientation, 111
  - Beverloo, Peter, 106, 221
  - Bidelman, Eric, 209, 225
  - bitmap images, 46
    - vs. vector graphics, 126
  - Blackberry, 19
  - blockquote element, 24
  - Blooman, Patrick, 20, 219
  - Blueprint.css* file, 18
  - Boolean attributes, 16
  - Bootstrap framework, 18
  - border-box value, for box-sizing property, 54
  - both keyword, for wrap-flow property, 203
  - bottom value, for object-position property, 61
  - Boulton, Mark, 85, 87, 221
  - Box Alignment module, information sources, 210, 226
  - box-sizing property, 54–55, 207
  - break-after property, 68–69
  - break-before property, 68–69
  - break-inside property, 68–69
  - breakpoints, 53
    - content, 57–59, 64, 220
  - breaks for columns, 68–70
  - broadband connections, 8
  - Brown, Brennen, 10, 218
  - browsers, 12
    - alert on size, 52
    - default behavior, 90
    - desktop, 3
    - developer tools in, 12
    - experimental features, enabling, 212–213
    - implementation of client-side validation, 154
    - rendering modes, 14–15
    - support, 18–19, 211–216
  - “business card” syntax, 29
  - business-to-business (B2B) sites, 2
- C**
- caching sequence, 186–187
  - calc() function, 55–56
  - Camen, Kroc, 167, 175, 224
  - camera, 116–117
    - accessing data stream from, 175
  - canvas
    - information sources, 140, 223
    - vs. SVG files, 138–139
  - canvas element, 125, 135–138
  - captions, for media files, 167–168
  - cascading variables, 200, 208–209, 210, 226
  - CDATA section in SVG file, 129
  - center value
    - for align-items property, 74
    - for grid alignment properties, 83
    - for justify-content property, 73
    - for object-position property, 61
  - chaining methods in jQuery, 99
  - change event handler, in Network Information API, 116
  - charging attribute, of navigator.battery object, 114
  - chargingchange event, in Battery Status API, 115
  - chargingTime attribute, of navigator.battery object, 114
  - chargingtimechange event, in Battery Status API, 115
  - charset attribute, for meta tag, 15
  - checkValidity() method, 156

child elements, in grid, 78  
Christian, Mark, 189, 225  
Chrome (browser), 3  
    enabling experimental  
        features in, 213  
Chrome for Android, Geolocation  
    opt-in prompt, 108  
Chrome Web Store, 178  
    documentation from, 188, 225  
    manifest file for, 179–180  
Chromium, 212  
circle element in SVG, 127–128, 131  
circles, arc() method for, 136  
Cisco, 10, 217  
classes in JavaScript, interaction with,  
    97–98  
classList object, 97  
clear keyword, for wrap-flow property,  
    203–204  
clear() method, 118  
clearWatch() method, 109  
click event, information in  
    object from, 93  
client-side validation  
    disabling, 155  
    of HTML form data, 154–156  
cloneNode() method, 193  
closing empty elements, 16  
Coenraets, Christopher, 106, 222  
color input, 150–151  
color picker, 150–151  
color query, for ebook reader, 51  
column value  
    for break-before property, 69  
    for flex-direction property, 71  
column-count property, 66–67, 207  
column-fill property, 67  
column-gap property, 67–68  
column-reverse value, for flex-direction  
    property, 71–72  
column-rule property, 68  
column-span property, 68  
columns property, 67  
column-width property, 66–67  
combining media queries, 44–45  
comma separator, in media queries, 44  
comments, in *.appcache* file, 186  
complementary role, 27  
condition, YepNope to test, 100  
conditional elements, for HTML5  
    in IE, 25  
*config.xml* manifest file, 181  
connection object, attributes, 115  
Constraint Validation API, 156–158  
    information sources, 160, 224  
Contacts API, 123  
contacts object, 183  
contain keyword  
    for object fit, 60–61  
    for object-position property, 61  
contains() method, 97, 120–121  
content attribute, 49  
content breakpoints, 57–59, 64, 220  
content element, 199  
content object, to access web  
    template, 193  
contentinfo role, 27  
context  
    for canvas element, 135  
    for content, 28  
    for device use, 7–9  
controls attribute, for media  
    elements, 162  
cookies, 117  
coords child object, 108  
cover keyword, for object fit, 60–61  
create() function, for contacts object, 183  
createObjectURL() method, 117  
createShadowRoot() method, 198  
CreativeJS, 176, 224  
cross axis, in Flexbox, 73  
CSS  
    future of, 200–209  
        Box Alignment module, 206  
        cascading variables, 208–209  
        Exclusions, 202–205, 210, 226  
        feature queries, 207–208  
        Line Grid module, 206  
        Paged Media module, 206  
        Pagination Templates, 206  
        Regions, 200–202  
    and HTML forms, 159  
    inheritance in, 195–196  
     preprocessors, 208  
    web component conflicts, 192  
CSS box model, 54  
CSS Exclusions, 202–205  
CSS layouts, 65–87  
    browser support, 214  
    convergence with SVG, 134–135  
Flexbox module, 70–78  
    adding flexibility, 75–76  
    alignment inside container,  
        73–75

- CSS layouts, Flexbox (*continued*)  
    changing content order, 71–72  
    checking browser for  
        properties, 101  
    declaring model, 70–71  
    information sources, 87, 221  
    wrap and flow, 76–78
- Grid Layout module, 18, 78–86  
    alignment and stacking, 83–84  
    Exclusions and, 204–205  
    grid declaration and definition,  
        79–80  
    grid template, 85–86  
    information sources, 87, 221  
    key terms, 78, 79  
    placing items on grid, 81–83  
    repeating grid lines, 81  
    September 2012 syntax update,  
        84–85  
    terminology, 78, 85
- Multi-column Layout module,  
    66–70  
    gaps and rules, 67–68  
    information sources, 87, 221  
    items spanning multiple rows or  
        columns, 82  
    spans and breaks, 68–70  
    for styling SVG file, 131
- CSS pixel, 45
- CSS selectors, 96–97
- CSS3, 16–18  
    @viewport at-rule for setting viewport  
        parameter, 49–50  
    frameworks and preprocessors, 18  
    vendor-specific prefixes, 17
- CSS.supports() method, 207
- CU-RTC-Web specification, 175
- currentSrc property, for media file, 170
- currentTarget property, of event object,  
    92, 96
- currentTime property, for media file, 170
- custom elements, 197–198, 210, 226
- D**
- Dahlström, Erik, 139, 223
- data attributes, 35–37  
    information sources, 38, 220  
    jQuery and, 36–37
- Data Attributes API, 35–36
- data() method, 36
- data property, for image  
    manipulation, 137
- data storage, user agents for, 117
- datalists, for form input suggestions,  
    146–147
- dataset property, 35
- datatransfer object, 120, 121
- datatypes, specifying for element, 120
- date-picker widget, 149
- dates, input types in forms, 148–150
- datetime attribute, 31
- datetime input, 149
- datetime-local input, 149
- Debenham, Anna, 10, 20, 218, 219
- debugging  
    in JavaScript, 105  
    tools for, 106, 222
- decorators, 194–196  
    vs. custom elements, 197
- defaultValue property, for output  
    element, 154
- defer attribute, 90–91  
    for script element, 90–91
- defs element, 132
- deleting item from storage, 118
- density-independent pixel (DIP), 45
- desktop browser, 3
- developer certificate, and PhoneGap  
    setup, 182
- developer tools in browser, 12
- Deveria, Alexis, 20, 218
- device adaptation, 48–50
- device APIs, 107–124  
    Battery Status API, 114–115  
    browser support, 215  
    camera and microphone, 116–117  
    Contacts API, 123  
    Device Storage API, 123  
    Drag and Drop API, 119–121  
    Firefox OS and WebAPIs, 123  
    Fullscreen API, 111–113  
    Geolocation API, 108–109  
    information sources, 124, 222  
    interacting with files, 121–123  
    Network Information API, 115–116  
    Orientation API, 110–111  
    PhoneGap. *See* PhoneGap  
    Vibration API, 113–114  
    Web Storage API, 117–119  
    WebSMS API, 123  
    WebTelephony API, 123

device emulators, 19  
device libraries, 212  
device pixel ratio (DPR), 46, 48  
    media feature to target, 47  
Device Storage API, 123  
device-aspect-ratio feature, 43  
device-height media feature, 43  
deviceorientation event, on `window` object, 110–111  
devicePixelRatio DOM property, for `window` object, 46  
deviceready event, in PhoneGap project, 183  
devices, 2–7  
    boundaries between, 58  
    desktop/laptop, 2–3  
    in-betweeners, 6–7  
    mobile, 3–4  
    tablets, 5  
device-width media feature, 43  
Dev.Opera, 176, 189, 224, 225  
DIP (density-independent pixel), 45  
:disabled pseudo-class, 159  
dischargingTime attribute, of `navigator.battery` object, 114  
dischargingtimechange event, in Battery Status API, 115  
display property, for grid element, 79  
div elements, 26  
    vs. semantic markup, 28  
Dive Into HTML5, 124, 222  
doctype declaration, 14–15  
Document Object Model (DOM),  
    selecting elements from, 96  
DOMContentLoaded event, 94  
domready event, 94  
dot notation (.), for storing items, 117  
DPPX (dots per pixel), 46  
dppx unit, 47  
DPR (device pixel ratio), 46, 48  
    media feature to target, 47  
Drag and Drop API, 119–121  
    information sources, 124, 222  
draggable attribute, 120  
dragover event, 119  
dragstart event, 120  
drawImage() method, 137  
drop event, 119  
drop shadow properties, 136  
drop zone, 119  
    list of files dropped in, 121  
Dublin Core, 30  
    metadata terms, 127  
duration property, for media elements, 171  
Dutton, Sam, 176, 224  
dynamic calculations, on length values, 55–56

## E

ebook readers, 6, 51  
ECMAScript, testing for support, 51  
Edge Inspect (Adobe), 19  
element element, 197  
elements  
    closing empty, 16  
    custom, 197–198, 210, 226  
    draggable attribute, 120  
    flow of content around, 202  
    flowchart, 38, 219  
    getting classlist of, 97  
ellipse element in SVG, 127  
em unit, 55–56  
email input type, for forms, 142–143  
embed element, 130  
embedded SVG files, 130–132  
empty elements, closing, 16  
:enabled pseudo-class, 159  
encapsulation, 192, 196  
encoding video format, 168  
end keyword, for `wrap-flow` property, 203–204  
end value, for grid alignment properties, 83  
error-checking for form input, client-side, 154–156  
*Essential Considerations for Crafting Quality Media Queries* (Gillenwater), 45  
event handlers, adding to elements, 91  
event listeners, removing, 93–94  
event object, 92–93  
events, for touch-enabled input, 94–96  
Exact Attribute Value Selector, 27  
Exclusions (CSS), 202–205  
exitFullScreen() method, 112  
experimental features  
    browser support for, 101–102  
    W3C standardization process and, 66  
explicit entries, 186

explicit sectioning, 23  
extends attribute, of element element, 197  
external stylesheets, use based on media, 40

**F**

fallback files, 186  
fallbacks, for media elements, 165–167  
feature phones, 3  
feature queries, 207–208 information sources, 210, 226  
feGaussianBlur element, 132  
feMorphology filter, 133  
FFmpeg, 168 information sources, 176, 224  
figure element, 24  
File API, 121–123 information sources, 124, 222  
file size, of images, 62  
File System API, 123  
File Writer API, 123  
FileReader interface, 122  
files, interacting with, 121–123  
files child object, 121  
fill attribute, 131  
fill keyword, for object fit, 60–61  
fillRect() method, 136  
filter attribute, 132  
Filter Effects, SVG and CSS convergence, 134  
filter element, 132  
find() method, 97 for contacts object, 183  
findAll() method, 97  
finger-based touch screens, 50  
Firebug, 12 message logged in console, 12–13  
Firefox (browser), 3, 4 audio or video format for, 166 enabling experimental features in, 212 experimental implementation of JavaScript, 16  
Firefox Marketplace, 188, 225 manifest file for, 180–181  
Firefox OS, 4, 123 information sources, 124, 222 and WebAPIs, 123  
Flash as fallback, 166 and iOS, 161

flex container, 70  
flex property, 75  
flex-basis property, 75  
Flexbox module, 70–78 adding flexibility, 75–76 alignment inside container, 73–75 changing content order, 71–72 checking browser for properties, 101 declaring model, 70–71 information sources, 87, 221 wrap and flow, 76–78  
flex-direction property, 71 combining flex-wrap with, 77  
flex-end value for align-items property, 74 for justify-content property, 73  
flex-grow property, 75  
flex-order property, 72  
flex-shrink property, 75  
flex-start value for align-items property, 74 for justify-content property, 73  
flex-wrap property, 76–77  
flow keyword, for wrap-through property, 204  
flow of content around element, 202  
flow-from property, for region chain, 201  
flow-into property, in CSS Regions, 201  
fluid design, 53  
fn (full name), in hCard pattern, 30  
footer element, 22  
footer for section, 24  
foreignObject element, 133  
form attribute for form, 146  
form role, 27  
formnovalidate attribute, for input element, 156  
forms. *See* HTML forms  
found time, 8  
fraction unit (fr), for grid definition, 79–80  
Fragment Identifiers, SVG sprites with, 130  
frameworks, in CSS3, 18  
full name (fn), in hCard pattern, 30  
Fullscreen API, 111–113 information sources, 124, 222  
:full-screen CSS pseudo-class, 113  
fullscreenchange event, 112  
fullScreenElement attribute, 112  
fullScreenEnabled attribute, 111  
function keywords, 134  
functions, anonymous vs. named, 92

## G

game console browsers, 6  
    information sources, 10, 218  
gamma property, for orientation, 111  
gaps between columns, 67–68  
Gaussian Blur effect, for SVG  
    graphic, 132  
Geolocation API, 108–109  
    information sources, 124, 222  
geolocation object, 108  
getContext() method, 135  
getCurrentPosition() method, 108  
getData() method, 120  
getElementsByClassName() method, 97  
getElementById() method, 96  
getElementsByTagName() method, 96  
getElementsByClassName() method, 97  
getImageData() method, 137  
getItems() method, 32  
getSVGDocument() method, 131  
getUserMedia() method, 116, 138  
    information sources, 124, 222  
GIF file format, 125  
Gillenwater, Zoe Mickley, 45, 63, 220  
global scope, 208  
Google, 1  
    audio or video format for, 166  
    Nexus, 6  
    Webmaster pages, 34  
graphics. *See* images  
grayscale devices, browsers on, 51  
Grid Layout module, 18, 78–86  
    alignment and stacking, 83–84  
    Exclusions and, 204–205  
    grid declaration and definition,  
        79–80  
    grid template, 85–86  
    information sources, 87, 221  
    key terms, 78, 79  
    placing items on grid, 81–83  
    repeating grid lines, 81  
    September 2012 syntax update,  
        84–85  
    terminology, 78, 85  
grid value, for display property, 79  
grid-area property, 85, 86  
grid-column property, 85  
    for grid cell reference, 81–82  
grid-column-align property, 83  
grid-column-position property, 84, 85  
grid-columns property, 79  
grid-column-span property, 82, 85

grid-definition-columns property, 84  
grid-definition-rows property, 84  
grid-position property, 85  
grid-row property, 85  
    for grid cell reference, 81–82  
grid-row-align property, 83  
grid-row-position property, 84, 85  
grid-rows property, 79  
grid-row-span property, 82, 85  
grid-span property, 85  
grid-template property, 85  
Grigsby, Jason, 10, 218  
gutter, in grid, 81

## H

HandBrake, 168  
handheld devices, orientation, 44  
Harmony, 191  
Hay, Stephen, 87, 221  
hCard microformat, 29  
    mark up, 33  
header element, 22, 27  
header elements (h1 to h6), 23  
header for section, 24  
height attribute  
    of video element, 163–164  
    of viewport, 41  
Heilmann, Christian, 106, 221  
hgroup element, 22, 24  
Hickson, Ian, 14, 213  
horizontal layout, in flex container, 71  
hosted web apps, vs. packaged, 178–179  
hover state, for mouse input, 50–51  
html element, manifest attribute of, 185  
HTML forms, 141–160  
    browser support, 215–216  
    client-side validation, 154–156  
    Constraint Validation API, 156–158  
    and CSS, 159  
    datalists, 146–147  
    information display for user,  
        151–154  
    meter element, 152–153  
    output element, 153–154  
    progress bars, 151–152  
information sources, 160, 223  
input types, 142–144  
new attributes, 144–146  
    autocomplete, 145  
    autofocus, 144  
    form, 146  
    multiple, 145

HTML forms, new attributes  
    (*continued*)  
        placeholder, 144–145  
        spellcheck, 145  
on-screen controls and widgets,  
    147–150  
    color, 150  
    dates, 148–150  
    numbers, 147–148  
HTML parsing, JavaScript  
    blocking of, 90  
HTML5, 13  
    best practices, 15–16  
    embedding SVG in, 130–132  
    new elements, 22–26  
        purpose, 23–24  
    responsive images solution, 62–63  
    schedule for Recommendation  
        status, 14  
    sectioning elements, downside of,  
        24–26  
    syntax for, 16  
    template, 14–15  
HTML5 Boilerplate, 15, 20, 218  
HTML5 Doctor, 38, 124, 219, 222  
HTML5 Please, 18, 20  
HTML5 Rocks, 124, 210, 222, 226  
    on Constraint Validation API,  
        160, 224  
    on image manipulation, 140, 223  
HTML5 Test, 19, 20, 218  
HTML5Shiv, 25  
HTMLAudioElement interface, 169, 173  
HTMLMediaElement interface, 169  
HTMLVideoElement interface, 169  
HTMLVideoFormat interface, 173  
hybrid apps, 123, 177, 181–184

**I**

icons object, in manifest file, 180–181  
id attribute  
    of filter element, 132  
    of form, 147  
IE Testdrive, 139, 223  
iframe elements, widths of media  
    feature, 42  
images. *See also* SVG files  
    browser support, 215  
    manipulation, 137–138  
    problem from file size, 62  
img element, 62, 128  
    dragging, 119

implicit sectioning, 23  
@import at-rule, 40  
Indexed Database (IndexedDB)  
    API, 119  
information display for user, 151–154  
    meter element, 152–153  
    output element, 153–154  
    progress bars, 151–152  
information sources  
    on CSS layout, 87, 221  
    on device APIs, 124, 222  
    on device-responsive CSS,  
        63–64, 220  
    on JavaScript, 106, 221–222  
    on HTML forms, 160, 223  
    on HTML5, 38, 219  
    on web platform, 20, 218  
inheritance, in CSS, 195–196  
inherited properties, in schema, 34  
input elements in forms, 142–144  
input events  
    in forms, listener for, 156  
    in JavaScript, 94–96  
input mechanism media features,  
    50–51  
*input-types.html* file, 143  
:in-range pseudo-class, 159  
interaction  
    with classes, 97–98  
    with files, 121–123  
interactive content, browser assistive

## J

JavaScript, 89–106  
    browser support, 214  
    for canvas element, 135  
    Firefox’s experimental  
        implementations of, 16  
    Firefox OS and, 123  
    for HTML5 and IE, 25  
    information sources, 106, 221–222  
    libraries, 89, 98–104, 200  
        jQuery, 98–100  
        Modernizr, 101–102  
        Mustache, 102–104  
        YepNope, 100–101  
    new features, 90–98  
        addEventListener method, 91–94  
        async and defer attributes, 90–91  
        CSS selectors, 96–97  
        DOMContentLoaded event, 94  
        getElementsByClassName()  
            method, 97  
        input events, 94–96  
        interaction with classes, 97–98  
    polyfills and shims, 104–105  
    revision, 191  
    testing and debugging, 51, 105  
        web component conflicts, 192  
Jobs, Steve, 161, 175, 224  
Jordesign, 64, 220  
JPEG file format, 125  
jQTouch, 100  
    information sources, 106, 221  
jQuery, 98–100, 200  
    data attributes and, 36–37  
    information sources, 106, 221  
jQuery Mobile, 100, 106, 221  
JS Bin, 105  
JS Fiddle, 105  
JSON text file, as manifest file, 179  
justify-content property, 73–74

## K

key, in Mustache, 102  
keyboard, on-screen, for form input, 143  
kind attribute, of track element, 167  
Kindle, 6  
Koblentz, Thierry, 58, 64, 220  
Kobo, 6  
Koch, Peter-Paul, 188, 225

## L

label element, 144  
LabUp!, 20, 219  
landmark roles, 26–27  
landscape mode, of viewport, 44  
lang attribute, 145  
latitude property, of coords object, 108  
Lauke, Patrick, 64, 220  
launch\_path field, in Firefox Marketplace  
    manifest, 181  
Lawson, Bruce, 20, 144, 160, 218, 224  
    New Exciting Web Technologies  
        (NEWT), 13  
layout viewport, 48  
layouts. *See* CSS layouts  
*Learning WebGL*, 140, 223  
length values  
    dynamic calculations on, 55–56  
    relative to viewport, 56–59  
level attribute, of navigator.battery  
    object, 114  
levelchange event, in Battery Status  
    API, 115  
LG Optimus Vu, 6  
libraries in JavaScript, 89, 98–104  
    jQuery, 98–100  
    Modernizr, 101–102  
    Mustache, 102–104  
    YepNope, 100–101  
Lie, Håkon Wium, 210, 226  
line element in SVG, 127  
lines. *See also* rules (lines)  
    in grid, 78–79  
link tag, declaring type for, 15–16  
linked SVG files, 128–130  
links, to script files, 90  
list attribute for form, 147  
listener  
    for addEventListener method, 91  
    for state changes, 52  
load event, 94  
load() method, for media elements, 170  
loading times of web pages, JavaScript  
    libraries and, 98  
localStorage object, 117  
location-based services, 108–109  
logic-less syntax, 102  
longitude property, of coords object, 108  
loop attribute, for media elements, 163  
Lubbers, Peter, 189, 225

## M

main axis, in Flexbox, 73  
main role, 27  
Manian, Divya, 28, 38, 219  
manifest attribute, of `html` element, 185  
manifest files  
  information sources, 188, 225  
  for web apps, 179–181  
`manifest.webapp` file, 180  
master entries, 186  
`matchMedia()` method, 52  
`max` attribute  
  for date or time, 149  
  for `meter` element, 152  
  for number input type, 148  
`max-` prefix, for media features, 42–43  
`maximum` keyword, for `wrap-flow`  
  property, 203  
`max-width` property, 60  
MDN (Mozilla Developer Network)  
  on feature queries, 210  
  on forms, 160  
  on Full Screen API, 215  
  on Media API and Events, 176  
  on media formats, 175  
measurement unit  
  fraction unit (`fr`), 79–80  
  for viewport dimensions, 41  
media. *See* multimedia  
Media API, 169–173  
media attribute, of `source` element,  
  63, 165  
media elements, fallbacks, 165–167  
media events, 173–174  
media features, 40  
  device adaptation, 48–50  
  dimensions as basis, 41–44  
  input mechanism, 50–51  
  `max-` and `min-` prefixes for, 42–43  
  `-webkit-device-pixel-ratio`, 47  
Media Fragments URI, 168–169  
media queries, 17, 40–51  
  browser support, 213  
  combining and negating, 44–45  
  comma-separated list of, 48  
  information sources, 63, 220  
  in JavaScript, 51–53  
  in mobile-first methodology, 58  
  resolution query, 47  
  for screen resolution, 46–48  
Media Queries Level 4 spec, script  
  feature, 51  
media stream, element for display, 116  
`MediaQueryList` object, 52  
MediaStream API, 175  
Meenan, Patrick, 20, 219  
meta tag, 15  
metadata, in Dublin Core, 127  
metadata value, for `preload` attribute, 163  
meter element, 114, 152–153  
metered attribute, of connection  
  object, 115  
microdata, 31–34  
  information sources, 38, 220  
  rich snippets, 34  
  Schema.org, 33–34  
Microdata API, 32  
microformats, 29–30  
  information sources, 38, 219  
microphone, 116–117  
  access to data stream from, 175  
Microsoft, 1  
  and MP4 format, 166  
  Surface, 6  
milestones, in JS Bin, 105  
Mills, Chris, 210, 226  
MIME type, 165  
`min` attribute  
  for date or time, 149  
  for `meter` element, 152  
  for number input type, 148  
`min-` prefix, for media features, 42–43  
`minimum` keyword, for `wrap-flow`  
  property, 203  
Miro Video Converter, 168  
mixins, 209  
mobile devices, 3–4  
  information sources, 63–64, 220  
  media playback on, 163  
mobile first methodology, 57–59  
*Mobile First* (Wroblewski), 58, 64, 220  
mobile libraries, information sources,  
  106, 221  
Modernizr, 101–102, 200  
  information sources, 106, 222  
`Modernizr.load()` method, 101  
modules, in CSS, 17  
monochrome query, for ebook reader, 51  
month, for date input, 149  
Morville, Peter, *Ambient Findability*,  
  38, 219  
MouseEvent interface, 96  
MozDev, 124, 222  
  on columns, 87, 221  
Mozilla Developer Center, 189, 225

Mozilla Developer Network. *See* MDN  
(Mozilla Developer Network)  
Mozilla, Firefox OS and WebAPIs, 123  
MP4 format, 166  
Multi-column Layout module, 66–70  
  gaps and rules, 67–68  
  information sources, 87, 221  
  items spanning multiple rows or  
    columns, 82  
  spans and breaks, 68–70  
multimedia, 161–176  
  advanced interaction, 174–175  
  browser support, 216  
  media elements, 162–168  
  subtitles and captions, 167–168  
multiple attribute for form, 145  
multi-screen use, 7  
Mustache, 102–104  
  information sources, 106, 222

## N

name attribute, of element element, 197  
name field, in Firefox Marketplace  
  manifest, 181  
named flow, in CSS Regions, 201  
named functions, vs. anonymous  
  functions, 92  
name-value pair, 31  
naming conflicts, 192  
native apps, 177  
native wrappers, 123  
nav element, 22  
navigation devices, awareness of page  
  structure, 26  
navigation role, 27  
navigator object, 116  
  vibrate() method on, 113  
navigator.battery object, 114  
negating, media queries, 44–45  
nesting elements, percentage  
  widths and, 54  
NetFront, on PlayStation 3, 6  
network entries, 186  
Network Information API, 115–116  
networkState property, 172  
Nintendo, 1  
Nintendo Wii, 6  
none keyword  
  for preload attribute, 163  
  for wrap-through property, 204  
Nook, 6

not operator  
  in feature queries, 207  
  in media queries, 44  
novalidate attribute, of form  
  element, 155  
nowrap value, for flex-wrap property, 76  
number input, 147–148  
Nyman, Robert, 124, 180, 188, 222, 225

## O

object element, for embedded  
  SVG file, 131  
object-fit property, 60  
object-position property, 60, 61–62  
objects  
  created by click event, information  
    contained in, 93  
  replaced, and responsive websites,  
    58–63  
  resizing, 60  
  sizing within container, 60  
O'Callahan, Robert, 139, 223  
offline availability, 185  
.oga file extension, for audio files, 164  
Ogg format, 164, 166  
.ogv file extension, for video files, 164  
on() method, 99  
on-screen keyboard, for form input, 143  
on-screen prompt  
  to access camera or  
    microphone, 116  
  for permission to enter fullscreen  
    mode, 111–112  
open device labs, 19  
Open Web App Manifest, 180  
Opera (browser), 3, 4  
  audio or video format for, 166  
  Mobile Emulator, 19  
  Presto rendering engine, 212  
  on remote debugging, 20, 219  
Opera Mini, 4  
Opera TV Store, 189, 225  
optimum attribute, for meter element, 153  
option child element, 146  
:optional pseudo-class, 159  
Opus format, 166  
or operator  
  comma separator in media  
    queries as, 44  
  for feature queries, 207  
ordinal group, creating, 72

organization, in hCard pattern, 30  
orientation  
    three-dimensional, information sources, 124, 222  
    of viewport, 44  
Orientation API, 110–111  
:out-of-range pseudo-class, 159  
output element, 153–154  
overflow-style property, 206

**P**

*Paciello Group Blog*, 38, 219  
packaged web apps, vs. hosted, 178–179  
PadFone (Asus), 7  
page elements, percentages for, 53–54  
page structure. *See also* grid layout models  
    navigation device awareness of, 26  
Pagination Templates, information sources, 210, 226  
parent element, and column flow, 67  
pattern attribute, of `input` type, 155  
pause event, in PhoneGap project, 184  
pause() method, for media element, 169  
percentages, for page elements, 53  
performance, 8–9  
    @import at-rule and, 40  
permanence of data storage, 117  
permission to enter fullscreen mode, prompt for, 111–112  
PhoneGap, 123, 181, 182–184  
    API, 182  
    events for, 183–184  
    information sources, 188, 225  
    permissions, 182  
phones, 3–4  
physical pixel count, 45  
pixels, 45–46  
pixels per centimeter (PPC), 45  
pixels per inch (PPI), 45  
placeholder attribute for form, 144–145  
play event, 174  
play() method, for media element, 169  
PlayStation 3, NetFront, 6  
plug-ins, disadvantages, 161  
PNG file format, 125  
Pointer Events, 94, 95–96  
pointer feature, 50  
pointerup event, 95  
polyfills, in JavaScript, 104–105  
polygon element in SVG, 127  
portable devices, battery status, 114–115

portrait mode, of viewport, 44  
poster property, 173  
PPC (pixels per centimeter), 45  
PPI (pixels per inch), 45  
PPK, 63–64, 160, 220, 223  
prefixes, vendor-specific, 17  
preload attribute, for media elements, 163  
 preprocessors, 18, 208  
Presto rendering engine (Opera), 212  
preventDefault() method, 93, 119, 120  
progress bars, 151–152  
progress element, 151–152, 171  
prompt  
    to access camera or microphone, 116  
    for permission to enter fullscreen mode, 111–112  
properties, 31  
    inherited, in schema, 34  
property-value pairs, in feature queries, 207  
pseudo-classes for HTML5 forms, 159  
    information sources, 160, 224

**Q**

querySelector() method, 96, 137  
querySelectorAll() method, 96  
quirks mode, 14–15

**R**

range element, 171  
range input, 147  
raster graphics, 46  
RDFa (Resource Description Format in Attributes), 30–31, 38, 220  
RDFa Core, 30  
readability, characters in text line and, 58  
readAsArrayBuffer() method, 122  
readAsDataURL() method, 122  
readAsText() method, 122  
:read-only pseudo-class, 159  
:read-write pseudo-class, 159  
readyState property, 173  
rect element in SVG, 127–128  
    style for, 131  
region chain, 201  
Regions (CSS), 200–202  
regular expressions, 155  
    information sources, 160, 224

Rel-Tag microformat, 29  
rem (root em), 56–57  
remoteItem() method, 118  
remove() method, 97  
removeEventListener() method, 93–94  
repeat() function, 81  
replaced objects, and responsive websites, 58–63  
requestFullScreen() method, 111–112  
required attribute, of `input` type, 154  
`:required` pseudo-class, 159  
Resig, John, 38, 220  
resizing objects, 60  
resolution media query, 47  
resolution of screen, 45  
Resource Description Format in Attributes (RDFa), 30–31, 38, 220  
Responsive Images Community Group, 64, 221  
responsive websites, 39  
vs. adaptive, 53–56  
browser support, 213  
and replaced objects, 58–63  
resume event, in PhoneGap project, 184  
RGBA color model, 137  
rich snippets, 34  
information sources, 38, 220  
right value, for `object-position` property, 61  
Robinson, Mike, 38, 219  
role attribute, 27  
root em (rem), 56–57  
`:root` selector, 208  
root-relative units, 56–57  
row value, for `flex-direction` property, 71  
row-reverse value, for `flex-direction` property, 71–72  
rows in graph, fraction unit for, 80  
rows in grid, items spanning multiple, 82  
Rubular, 160, 224  
rules (lines)  
between columns, 67–68  
in grid, repeating, 81

## S

Safari (browser), 3  
Safari mobile, 212  
Samsung, 1, 189, 225  
Samsung Galaxy Note II, 6  
Samsung Galaxy S III, 6, 46  
scalability, SVG and, 139  
Scalable Vector Graphics.  
*See* SVG (Scalable Vector Graphics)  
schema, 30  
Schema.org, 33–34  
information sources, 38, 220  
Schulze, Dirk, 139, 223  
scoped styles, 195–196  
screen resolution, 45  
for desktops, 3  
media queries for, 46–48  
screen sizes, 6  
script element  
defer attribute for, 90–91  
in Media Queries Level 4 spec, 51  
script tag, declaring type for, 15–16  
scripts, initiating, 94  
scrolling, 206  
SDKs (software development kits), 19  
search input type, for forms, 142  
search role, 27  
section elements, 22–24  
sectioning, 22  
downside of, 24–26  
implicit or explicit, 23  
sectioning roots, 24  
sections, from Mustache, 103  
Seddon, Ryan, 160, 223  
seeking property, for media elements, 171  
Seidelin, Jacob, 140, 223  
selector, in jQuery, 99  
semantic markup  
browser support, 213  
importance of, 28–29  
information sources, 38, 219  
semantic richness, 21  
session storage, 117  
sessionStorage object, 117  
setCustomValidity() method, 158  
setData() method, 120  
setItem() method, for storing item, 117  
Shadow DOM, 198–199  
information sources, 210, 226  
shadow root, 198  
shape elements in SVG, 127  
shaped exclusions, 205  
shape-inside property, 205  
shape-outside property, 205  
shims, in JavaScript, 104–105  
simultaneous screening, 7

Sitepoint, 210, 226  
sites. *See* websites  
smart TVs  
    information sources, 189, 225  
    Internet-connected, 184  
smartphones, 3–4  
    PPI count, 45  
    use stereotypes, 8  
snapshots, in JS Bin, 105  
soft keyboard, for form input, 143  
software development kits (SDK), 19  
Souder, Steve, 40  
source element, 62, 64, 220  
SourceGraphic keyword, 132  
space-around value, for justify-content property, 73  
space-between value, for justify-content property, 73  
spans for columns, 68–70  
speed, 8–9  
spellcheck attribute for form, 145  
sprites for icons, 129  
square bracket ([ ]) notation, for storing item, 117  
src attribute, of track element, 167  
srclang attribute, of track element, 167  
srcset attribute, 62, 63  
stacking, in grid layout, 83–84  
standalone attribute, in XML declaration, 127  
standards mode, 15  
Stark, Jonathan, 4, 10, 218  
start keyword  
    for grid alignment properties, 83  
    for wrap-flow property, 203–204  
statistics, information sources, 10, 217  
status property, of `window.applicationCache` object, 187  
stdDeviation attribute, for `feGaussianBlur` element, 132  
step attribute, for date or time, 149  
stepDown() method  
    for date or time, 150  
    for number input type, 148  
stepUp() method  
    for date or time, 150  
    for number input type, 148  
stereotypes, context, 8  
Stevens, Luke, *The Truth About HTML 5*, 25, 38, 219  
storage event, 118  
Storey, David, 10, 218  
stretch value  
    for align-items property, 74  
    for grid alignment properties, 83  
stroke() method, 136  
structure  
    browser support, 213  
    importance of, 21  
structured data, 29  
style tag, declaring type for, 15–16  
styles, scoped, 195–196  
stylesheets  
    media queries to apply to viewport, 58  
    use of external based on media, 40  
subsequent screening, 7  
subtitles, for media files, 167–168  
`@supports` at-rule, 102, 207  
svg element, 127  
SVG (Scalable Vector Graphics) files, 125  
    vs. canvas, 138–139  
    convergence with CSS, 134–135  
    drawback, 135  
    embedded, 130–132  
    filters, 132–134  
    information sources, 139–140, 223  
    linked files, 128–130  
format, 125, 126–135  
    anatomy of image, 127–128  
    linked files, 128–130  
    sprites, 129–130  
SVG2, 134  
swapCache() method, of `window`.  
    `applicationCache` object, 187  
sympathetic keyboard layout, 143

## T

tablets, 5, 50  
tags, lowercase or uppercase characters for, 16  
:target pseudo-class, 130  
Taubert, Tim, 138, 140, 223  
tel input type, for forms, 143  
template element, 193  
templates  
    client-side system, 102  
    for grid, 85–86  
    and scoped styles, 196  
    for script tags, 104  
    for web components, 192–194

terminology, 12  
testing, 19  
    browsers for JavaScript support, 51  
    in JavaScript, 105  
text files, content as, 122  
text input, 142  
text tracks, for media files, 167–168  
Theora format, 164  
three-dimensional. *See* 3-D...  
timeupdate event, 171, 174  
Titanium, 184  
    information sources, 189, 225  
toggle() method, 98  
top value, for object-position  
    property, 61  
Touch Events specifications, 94–95  
touch-enabled input, events for, 94–96  
touch screens  
    finger-based, 50  
    for tablets, 5  
touchcancel event, 95  
touchend event, 95  
touchenter event, 95  
TouchEvent object, 95  
touchleave event, 95  
touchmove event, 95  
touchstart event, 95  
track child element, 167  
    information sources, 176, 224  
tracks in grid, 78, 79  
Transforms module, 134  
*The Truth About HTML 5* (Stevens), 25,  
    38, 219  
TV, web-enabled, 5–6  
TV apps, 184  
Twitter, 18  
    data attributes use by, 37  
type attribute, for audio element, 165  
type parameter, 91  
typeof operator, 36

## U

Ubuntu Phone, 6  
UI element states pseudo-classes, 159  
Unicode characters, 15  
unit of measure  
    fraction unit (fr), 79–80  
    for viewport dimensions, 41  
Universal Plug and Play (UPnP), 191  
update() method, of window  
    .applicationCache object, 187

updateready event, of window  
    .applicationCache object, 187  
UPnP (Universal Plug and Play), 191  
url() function, 128  
url input type, for forms, 142–143  
useCapture parameter, for  
    addEventListener method, 91  
user agents, 12. *See also* browsers  
    for data storage, 117  
user-defined attributes, 35  
.user-error pseudo-class, 159  
users, information display for, 151–154  
UTF-8, 15  
*UX Magazine*, 10, 218

## V

:valid pseudo-class, 159  
validation rule, custom, 158  
validation tool, for manifest files,  
    188, 225  
validationMessage property, 158  
validity property, 157  
validityState object, 157–158  
value attribute, for progress element, 151  
value property, for output element, 153  
valueAsDate property, 150  
valueAsNumber property (DOM), 148  
valueMissing property, 157  
van Kesteren, Anne, 176, 224  
var() function, 208  
variables  
    cascading, 200, 208–209  
    creating with Mustache, 103  
vcard class, 30  
vector graphics, 46  
    vs. bitmaps, 126  
vendor-specific prefixes, 17  
version field, in Firefox Marketplace  
    manifest, 181  
version property, in manifest file, 180  
vh unit, 56  
vibrate() method, on navigator  
    object, 113  
Vibration API, 113–114  
video element, 116, 162–163  
    additional attributes, 163–164  
    multiple source files for, 164  
video format  
    encoding, 168  
    variation in browser support, 166  
videoHeight attribute, 173

- `videoWidth` attribute, 173
  - `viewport`
    - dimensions of, 41
    - length units relative to, 56–59
    - media query to apply stylesheet, 58
    - orientation of, 44
  - `viewport` meta tag, 49
  - `@viewport` at-rule, for setting `viewport` parameter, 49–50
  - Vision Mobile, 10, 217
  - `volume` property, for media elements, 171
  - `volumechange` event, 174
  - Vorbis format, 164
  - `vw` unit, 56
- ## W
- W3C (World Wide Web Consortium), 14
    - HTML5 specification, 20, 218
    - Media Fragments specification, 176, 224
    - widgets, 181
  - WAI-ARIA (Web Accessibility Initiative, Accessible Rich Internet Applications), 26, 38, 219
  - Walsh, David, 124, 222
  - `watchPosition()` method, 109
  - WCAG Audio Control page, 175, 224
  - Web Accessibility Initiative, Accessible Rich Internet Applications (WAI-ARIA), 26, 38, 219
  - Web Applications 1.0, 13
  - web apps, 12, 177, 178–181
    - hosted vs. packaged, 178–179
    - manifest files, 179–181
  - Web Audio API, 174
  - Web Components, 37, 192–200
    - custom elements, 197–198
    - decorators, 194–196
    - Shadow DOM, 198–199
    - templates, 192–194
  - web pages
    - experimental features, 191–210
      - web components, 192–200
    - loading times, JavaScript libraries and, 98
  - web platform, 13
    - browser support, 213
    - technologies included, 19
  - Web Storage API, 117–119
    - information sources, 124, 222
  - WebAPIs, 123
    - and Firefox OS, 123
  - web-enabled devices, 2
  - web-enabled TVs, 5–6
  - WebGL, 138
  - WebGL.com, 140, 223
  - Webinos, 185, 189, 225
  - WebKit engine, 4, 19
  - WebKit Web Inspector, key:value pair displayed in, 118
  - `-webkit-device-pixel-ratio` media feature, 47
  - WebM format, 166, 168
  - WebRTC project, 116, 174–175, 176, 224
  - websites
    - adaptive vs. responsive, 53–56
    - for book, 18
    - meaning of, 12
  - WebSMS API, 123
  - WebTelephony API, 123
  - WebVtt format, 168
    - information sources, 176, 224
  - week, for date input, 149
  - weinre, 19
  - WHATWG, 14
  - widgets, 181, 188, 225
  - `width` attribute
    - for video element, 163–164
    - of viewport, 41
  - `widthMatch()` function, 52
  - Wilcox, Matt, 64, 220
    - Adaptive Images, 63, 64, 221
  - `willValidate` property, 156
  - window object, `deviceorientation` event on, 110–111
  - `window.applicationCache` object, 187
  - `window.navigator` object, 108
  - Windows 8, and tablets, 5
  - Windows Phone, 4, 19
  - World Wide Web Consortium (W3C), 14
    - HTML5 specification, 20, 218
    - Media Fragments specification, 176, 224
    - widgets, 181
  - `wrap` in flexbox, 76–78
  - `wrap` value, for `flex-wrap` property, 76–77
  - `wrap-flow` property, 202–203
  - wrappers, native, 123
  - `wrap-reverse` property, 77
  - `wrap-through` property, 204
  - Wroblewski, Luke, *Mobile First*, 58, 64, 220

## X

- x*-axis, 110
  - rotation around, 111
- XML file
  - manifest file as, 179
  - SVG file format as, 127
  - Widget manifest file as, 181
- X-Tags, 210, 226

## Y

- y*-axis, 110
  - rotation around, 111
- YepNope, 100–101
  - information sources, 106, 221
  - properties used in Modernizr, 102

## Z

- z*-axis, 110
  - rotation around, 111
- z-index* property, 84
- Zakas, Nicholas, 124, 222
- Zepto, 100
  - information sources, 106, 221
- zoom level, user control over, 49
- zoomed-out view, 48