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STUDENT STUDY GUIDE

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EXAM 98-375
HTML5 Development Fundamentals

PREPARING FOR MTA CERTIFICATION

MICROSOFT TECHNOLOGY ASSOCIATE (MTA) STUDENT STUDY GUIDE FOR DEVELOPERS

98-375 HTML5 Application Development Fundamentals

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INTRODUCTION

MTA validates building-block technology concepts and helps students explore, discover and pursue successful careers in Information Technology (IT) in an exciting and rewarding way! As the first step in the Microsoft Technology Certification Series, this new, entry-level certification provides students with confidence, credibility, and differentiation.

Explore IT career options without committing a lot of time and resources MTA exams validate the core technology knowledge that is in demand today by businesses around the world. Whether you want to explore becoming a network administrator, software engineer, web developer, or database analyst, MTA gets you started on the right path.

Prepare to compete A little investment in IT can go a long way in today's job market. Becoming MTA certified helps you build a solid foundation to prepare for intermediate technology studies and for Microsoft Certified Technology Specialist (MCTS) certifications. It can also help you compete on college admissions and jumpstart your IT career planning!

Empower yourself As the first step toward becoming an MCTS, MTA shows your commitment to technology while connecting you with a community of more than five million Microsoft Certified Professionals. Learn from them and show them what you know by becoming MTA certified!

This MTA Student Study Guide serves as a study tool to help students prepare for their MTA certification exam. Students are challenged with real-life situations for each of the major topics covered in the exam. Although successful completion of the study guide exercises does not guarantee that you will pass your MTA exam, it is an excellent way to gauge your readiness to take the exam and build confidence that you know your stuff on exam day.

I wish you all the best as you prepare for a successful career in technology!

Victoria Pohto

Victoria Pohto
MTA Product Marketing Manager



CAREER PLANNING

Most IT solutions or infrastructure built on Microsoft technologies require proficiency with one or all of the following products, often referred to as “The Microsoft Stack.”

- Microsoft Windows® Server® as the data center or development platform
- Microsoft SQL Server® as the data and business intelligence (BI) platform
- Microsoft Visual Studio® as the suite of application life-cycle management tools

MTA is the starting point of Microsoft technology certifications, providing aspiring technologists with the fundamental knowledge essential to succeed with continued studies and a successful career with technology.

Preparing for and becoming MTA certified helps you explore a variety of career paths in technology without investing a lot of time and money in a specialized career path. When you find a path that is right for you, Microsoft learning products and certification can help you prepare and guide your longer-term career planning.

If you already know that you want to start building a career in technology, MTA preparation and certification is the recommended entry point. Becoming MTA certified shows that you have a firm working

knowledge of the fundamental IT concepts critical for success with intermediate learning and certifications such as Microsoft Certified Technology Specialist (MCTS). Moreover, Microsoft certifications demonstrate an individual’s commitment of self-investment and confidence to take his or her knowledge and skills to the next level with an industry-recognized credential.

MTA is the first step toward your IT career goal and can help differentiate you for an internship or to college admissions committees. As you prepare for your first job focusing on technology, be sure that you are equipped with an MCTS credential—the intermediate level certification that validates Microsoft product and technology skills.

A visual mapping of the MTA Certification paths can be found at <http://www.microsoft.com/learning/en/us/certification/mta.aspx> and will show you the MTA exams that are recommended prior to taking on some of Microsoft’s intermediate technology certification, MCTS. MTA is the first step to Microsoft® Technology Certification Series. MTA is a recommended but not required pre-requisite to MCTS exams. One certification is earned for each exam passed. Free Student Study Guides are available for download at www.certipoint.com/mta.



EXPLORING JOB ROLES

Choosing a career path is a big decision and it's not always easy, but you're not alone! Microsoft created a career site to help students understand the options and possibilities of pursuing a career in IT. The site also connects you with learning resources, student techie communities, and much more to help you prepare for a career in technology.

To chart your career with Microsoft technology, visit www.microsoft.com/learning/career/en/us/career-org-charts.aspx.

DATABASE ADMINISTRATOR

As a database administrator, you are in charge of important databases that span multiple platforms and environments. You are a strong team player who thrives in a fast-paced environment. You build complex, highly scalable databases that meet business needs and security requirements. You are an expert in optimizing, maintaining, and troubleshooting databases, but also in designing archival, data distribution, and high-availability solutions.

SERVER ADMINISTRATOR

As a server administrator, you are in charge of implementing and managing some of the most important technology in your organization—the servers. You use extensive monitoring and profiling tools to manage the network and tune systems so they perform at optimal levels. You are an expert in Active Directory®, and you have an in-depth understanding of network protocols, and file and directory security.

COMPUTER SUPPORT TECHNICIAN

Consider starting your IT career by becoming a consumer support technician. You don't need any formal work experience, but a company might require that you know how to install, administer, and troubleshoot operating systems in a home network environment that has desktop computers, laptops, and printers. As a consumer support technician, you'll also handle network, virus, malicious software, and hardware support issues. You'll typically find this position in small to medium-sized organizations.



EXPLORING JOB ROLES

WEB DEVELOPER

As a web developer, you are an expert in using the dynamic programming tools and languages that fuel the web. You might work independently or be part of a team that builds and integrates interactive web sites, applications, and services for both internal and public sites. Your role is to make it work, which means developing web applications and testing them on various browsers, enhancing and modifying them as necessary to ensure the best experience for the user. As a web developer, you might also architect websites, design data-driven applications, and find efficient client-server solutions. You must have an in-depth understanding of the software development life cycle and be able to communicate project status, issues, and resolutions.

WINDOWS DEVELOPER

As a Windows client developer, knowing how to optimize Windows code and track bugs is a given. But you also know how to use Microsoft Visual Studio® and the Microsoft .NET framework to design, develop, test, and deploy Windows-based applications that run on both corporate servers and desktop computers. Your key talents include understanding multiple Windows application models and n-tier applications, and knowing how to work with object-oriented

programming, algorithms, data structures, and multithreading. Windows developers have an in-depth understanding of software engineering principles, software life cycles, and security principles.

Additional Online Resources for New Developers:

<http://msdn.microsoft.com/beginner>

<http://msdn.microsoft.com/rampup>

IMAGINE CUP

The Imagine Cup is the world's premier student technology competition where students from around the world can learn new skills, make new friends, and change the world. Competitions include Software Design, Embedded Development, Game Design, Digital Media and Windows Phone 7. The brightest young minds harness the power of technology to take on the world's toughest problems.

www.imaginecup.com



VALUE OF CERTIFICATION

Technology plays a role in virtually everything we do. In the 20-plus years since Microsoft has been certifying people on its products and technologies, millions of people have gained the knowledge, expertise, and credentials to enhance their careers, optimize business solutions, and create innovation within just about every business and social sector imaginable. Today's Information Technology (IT) hiring managers are more often using professional credentials, such as Microsoft certification, to identify properly skilled IT candidates. Certification becomes a way to easily differentiate qualified candidates in a sea of resumes.

The job outlook for IT professionals, as reported in a study prepared by the U.S. Department of Labor's Bureau of Labor Statistics (BLS), is positive! The BLS indicates an increase that will be "faster than the average for all occupations through 2014" for Computer Support Specialists, Systems Engineers, Database Administrators, and Computer Software Engineers. One significant message resulting from

this study is that information and communications technology (ICT) skills are the entry ticket to the job market, regardless of the country, industry, or job function. Information Technology is clearly an area worth investing time, resources, and education in – and technology certification is a key part of the education process, validating product and technology expertise as a result of their learning experiences.

Microsoft IT Certifications provide objective validation of the ability to perform critical IT functions successfully for worldwide IT professionals, developers, and information workers. Microsoft certifications represent a rich and varied spectrum of knowledge, job roles, and responsibilities. Further, earning a specific certification provides objective validation of the candidate's ability to perform critical IT functions successfully. Embraced by industry professionals worldwide, Microsoft certification remains one of the most effective ways to help reach long-term career goals.



MTA 98-375

HTML5 APPLICATION DEVELOPMENT



OBJECTIVE 1

Manage the Application Life Cycle

IN THIS CHAPTER

- 1.1 Understand the platform fundamentals
- 1.2 Manage the state of an application
- 1.3 Debug and test an HTML5-based touch-enabled application
- 1.4 Publish an application to a store





OBJECTIVE

manage the application life cycle 1.1

UNDERSTAND THE PLATFORM FUNDAMENTALS

SCENARIO: Alfons Parovszky works as a technical writer at A. Datum Corporation. His job responsibilities include writing technical specifications for customers who have chosen A. Datum Corporation for their web hosting needs.

His supervisor recently assigned him the task of updating the specifications to include the changes for HTML5 in addition to the considerations necessary for handling various device platforms such as smartphones, slates, tablets, and devices with touch screen capabilities.

- 1. What HTML5 features assist in handling various device sizes?**
 - a. Cookies.
 - b. Media queries.
 - c. Plug-ins.
- 2. Alfons needs to verify the hosting specifications for the HTML5 client. Which item(s) are most related to this concern?**
 - a. Reliability, scalability, technical support, security, and support for various operating systems.
 - b. Plug-in support such as Microsoft® Silverlight® and Flash.
 - c. The developer application used by the client.
- 3. If the client used Microsoft Expression® Web to create the site, what command should he specify in his documentation to prepare the site for hosting?**
 - a. Site/Import.
 - b. Site/Publishing Settings.
 - c. Site/Export Web Package.

HINT



Ensure that the website host supports multiple platforms including Microsoft Windows®, Internet Explorer®, and Windows Phone 7.

Answers

1. What HTML5 features assist in handling various device sizes?
 - b. **Media queries.** This feature, introduced with HTML5 and CSS3, allows the program to detect the device and resize the site display accordingly.
2. Alfons needs to verify the hosting specifications for the HTML5 client. Which item(s) are most related to this concern?
 - a. **Reliability, scalability, technical support, security, and support for various operating systems.**
3. If the client used Microsoft Expression Web to create the site, what command should he specify in his documentation to prepare the site for hosting?
 - c. **Site/Export Web Package.**

Essential details

- **Application packaging** is the process of bundling an application and its resources into an archive format for the purpose of distribution and deployment.
- **Permissions** are grouped into permission sets, and every assembly is assigned a set. The .NET Framework defines some standard permission sets such as FullTrust (implies all permissions) and Execution (permission to access the CPU only).
- Each user account is assigned a level of access (**credentials**). They can be set to use Windows Authentication, database authentication, no authentication, or custom authentication.

FAST TRACK HELP

- **New! HTML5 and CSS: Six Complete Lessons**
http://blogs.msdn.com/b/mis_laboratory/archive/2011/10/18/new-html-5-and-css-six-complete-lessons.aspx
- **MSDN® Developer Samples**
<http://code.msdn.microsoft.com/site/search?f%5B0%5D.Type=Technology&f%5B0%5D.Value=HTML5>
- **W3Schools site**
<http://www.w3schools.com/html5/default.asp>



OBJECTIVE

manage the application life cycle 1.2

MANAGE THE STATE OF AN APPLICATION

SCENARIO: Yun-Feng Peng owns a small business that sells and rents woodwind and percussion instruments to local schools. Mr. Peng has a presence on the web, but his site is slightly outdated. His son just graduated with a degree in information science and technology, so he offered to help his father update the site.

Mr. Peng talked to his son about one of his major concerns, the potential threat of using cookies to store sensitive data. His son explained the changes introduced in HTML5 that specifically target this concern.

1. What change in HTML5 has changed how data is persistent across user sessions?

- a. Use of improved cookies.
- b. Use of localStorage and sessionStorage.
- c. Media queries.

2. What does it mean that HTTP is a stateless protocol?

- a. HTTP does not retain data from session to session.
- b. HTTP saves information for one session only.
- c. HTTP saves only form data.

3. What allows HTML5 applications to work in an offline state?

- a. HTTP.
- b. AppCache.
- c. Cookies.

HINT

A benefit of using localStorage is the reduction of the calls to the server, whereas HTTP retrieves cookies with every request.

Answers

1. What change in HTML5 has changed how data is persistent across user sessions?
 - b. **Use of localStorage and sessionStorage.** The sessionStorage method keeps data for the duration of the current session; localStorage allows users to save large amounts of data from session to session.
2. What does it mean that http is a stateless protocol?
 - a. **HTTP does not retain data from session to session.** Because HTTP is a stateless protocol, it requires a method to retain data; therefore, developers used cookies. Now developers can use localStorage and sessionStorage.
3. What allows HTML5 applications to still work in an offline state?
 - b. **AppCache.** AppCache stores frequently-used resources such as images, CSS, JS, and HTML pages even when the user is offline.

Essential details

- **Session state** is created when the user makes the first request to access an application and ends when the user closes the session.
- **Application state** is created when the first request goes to the web server and is released when the application is closed.
- **Persist state information** is data that needs to continue to exist after the session has ended.

FAST TRACK HELP

- **New! HTML5 and CSS: Six Complete Lessons**
http://blogs.msdn.com/b/mis_laboratory/archive/2011/10/18/new-html-5-and-css-six-complete-lessons.aspx
- **MSDN® Developer Samples**
<http://code.msdn.microsoft.com/site/search?f%5B0%5D.Type=Technology&f%5B0%5D.Value=HTML5>
- **W3Schools**
<http://www.w3schools.com/HTML5/default.asp>



OBJECTIVE

manage the application life cycle 1.3


DEBUG AND TEST AN HTML5-BASED TOUCH-ENABLED APPLICATION

SCENARIO: Wingtip Toys is a rapidly growing toy company with a great web presence. With the introduction of touch-screen technology, they have decided to provide their end-users with some mini touch-screen games as an incentive to visit their site. The games are designed around holiday themes. For example, in December they posted several games with Christmas, Hanukah, and Kwanza themes.

Each game that is developed must go through rigorous debugging and testing before it is posted for play.

- 1. If the developer does not have a touch-screen device, how can he or she debug the application prior to testing?**
 - a. Use MouseTouch events and an online touch-screen emulator.
 - b. He or she cannot test until it is deployed to a touch-screen device.
 - c. Program it to respond to voice commands.
- 2. What are some touch-enabled best practices to test for?**
 - a. Prevent zooming, prevent scrolling, and render carefully.
 - b. Allow email and messaging.
 - c. Use as many new HTML5 features as possible.
- 3. How can the developer validate the new HTML5 code?**
 - a. If the code compiles with no errors, it is validated.
 - b. Use an online simulator.
 - c. Use the W3C code validators.

HINT



It can be difficult to debug a touch-enabled application on a mobile device, so take advantage of the online emulators.

Answers

1. If the developer does not have a touch-screen device, how can he or she debug the application prior to testing?
 - a. **Use MouseTouch events and an online touch-screen emulator.**
2. What are some touch-enabled best practices to test for?
 - a. **Prevent zooming, prevent scrolling, and render carefully.** There are situations in which zooming and scrolling can be useful, such as when viewing a picture or an image.
3. How can the developer validate the new HTML5 code?
 - c. **Use the W3C code validators.** W3C has up-to-date validators for HTML5. Remember, a validator is different from an emulator, which just renders the application and does not test the code for accuracy.

Essential details

- **Debugging** is the action of detecting, locating, and correcting logical or syntactical errors in a program or malfunctions in hardware.
- **Document Object Model (DOM)** is a World Wide Web Consortium (W3C) specification that describes the structure of dynamic HTML and XML documents.
- Hardware or software designed to make one type of computer or component act as if it were another is called an **emulator**.
- A computer screen designed to recognize the location of a touch on its surface is called a **touch screen**.

FAST TRACK HELP

- **Internet Explorer® Learning**
<http://msdn.microsoft.com/en-us/ie/aa740476>
- **Internet Explorer Test Drive**
<http://ie.microsoft.com/testdrive/default.html>
- **W3C Mobile Device Validator**
<http://validator.w3.org/mobile/>

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OBJECTIVE


manage the application life cycle 1.4

PUBLISH AN APPLICATION TO A STORE

SCENARIO: Begoña Hurtado recently graduated from college with a degree in information science and technology and an additional certificate in web development. Begoña has set a goal to pay off her college loans as soon as possible. She is creating applications that she can publish to an application store to earn extra revenue to help achieve her goal.

- 1. What steps does she need to take before publishing an application?**
 - a. Plan a promotion strategy for her application.
 - b. Configure, build, and test a release version.
 - c. Review her use of localStorage and sessionStorage for her application.
- 2. On what platform or store can Begoña sell her Metro application?**
 - a. Android Market.
 - b. Windows® 7.
 - c. Windows Phone SDK.
- 3. Why should Begoña create a vector icon for her application?**
 - a. Because people like pictures more than text.
 - b. To demonstrate her graphic art capabilities.
 - c. To promote the brand and help users discover the application.

HINT



When creating an icon image for your application, use a vector image to retain clarity when it is scaled larger or smaller.

Answers

1. What steps does she need to take before publishing an application?
 - b. **Configure, build, and test a release version.**
2. On what platform or store can Begoña sell her Metro application?
 - a. **Android Market.** The Windows Store is scheduled for release in February 2012.
3. Why should Begoña create a vector icon for her application?
 - c. **To promote the brand and help users discover the application.**

Essential details

- An End-User License Agreement (**EULA**) is a legal agreement between a software manufacturer and the purchaser with regard to terms of distribution, resale, and restricted use.
- A **launcher icon** is a graphic that represents an application on the device's Home screen and in the Launcher window.

FAST TRACK HELP

- **Windows Store for developers**
<http://blogs.msdn.com/b/windowsstore/archive/2011/12/06/announcing-the-new-windows-store.aspx>
- **Windows Phone Marketplace**
[http://msdn.microsoft.com/en-us/library/hh202930\(VS.92\).aspx?ocid=otc-n-nz-dca-gzdcao](http://msdn.microsoft.com/en-us/library/hh202930(VS.92).aspx?ocid=otc-n-nz-dca-gzdcao)
- **Android Developers**
<http://developer.android.com/guide/publishing/preparing.html>

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OBJECTIVE 2

Build the User Interface by Using HTML5

IN THIS CHAPTER

- 2.1 Choose and configure HTML5 tags to display text content
- 2.2 Choose and configure HTML5 tags to display graphics
- 2.3 Choose and configure HTML5 tags to play media
- 2.4 Choose and configure HTML5 tags to organize content and forms
- 2.5 Choose and configure HTML5 tags for input and validation





OBJECTIVE

build the user interface by using HTML5 2.1

CHOOSE AND CONFIGURE HTML5 TAGS TO DISPLAY TEXT CONTENT

SCENARIO: Diane Prescott is a veteran web developer. She prefers to use Microsoft® Expression® Web when creating new websites. She has been working on updating some existing sites to comply with the new HTML5 standards. She is thrilled with the direction of the World Wide Web Consortium (W3C) in reducing the complexity of existing tags, especially for displaying text.

1. What is the new syntax for the doctype declaration?

- a. `<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">`
- b. `<!DOCTYPE HTML>`
- c. `<HTML DOCTYPE>`

2. What does it mean when a tag has been deprecated?

- a. It is outdated and no longer supported.
- b. It has been replaced by another tag.
- c. It is new to HTML5.

3. If the `` tag is not supported in HTML5, how is the font family for text changed?

- a. With cascading style sheets (CSS).
- b. By using the `<font-family>` tag.
- c. All text must be displayed as Times New Roman.



To keep up with the changing status of HTML tags, review the HTML5 Tutorial tag list section of W3Schools.

Answers

1. What is the new syntax for the doctype declaration?
 - b. `<!DOCTYPE HTML>`.
2. What does it mean when a tag has been deprecated?
 - a. **It is outdated and no longer supported.** When a tag is deprecated, it is no longer supported in the latest versions of HTML. However, HTML5 is backward compatible for now, so older applications with deprecated tags will still work.
3. If the `` tag is not supported in HTML5, how is the font family for text changed?
 - a. **With cascading style sheets (CSS).** HTML5 is enforcing the separation of style from content. To change the look and feel of text, images, and other web content, the developer must use a cascading style sheet.

Essential details

- **Cascading style sheets (CSS)** is a Hypertext Markup Language (HTML) specification developed by the World Wide Web Consortium (W3C). The style sheets include typographical information on how the page should appear, including elements such as text font.
- **Doctype** is a declaration at the beginning of an SGML document that provides a public or system identifier for the document type definition (DTD) of the document.
- A **deprecated** element or attribute is one that has been outdated by newer constructs.
- Programming languages are subject to certain **semantic** rules. A program statement can be syntactically correct but semantically incorrect; a statement can be written in an acceptable form and still convey the wrong meaning.

FAST TRACK HELP

- **Learn HTML5 in 5 Minutes**
<http://msdn.microsoft.com/en-us/hh549253>
- **Complete set of HTML5 elements**
<http://dev.w3.org/html5/markup/elements.html#elements>
- **W3Schools**
<http://www.w3schools.com/html5>

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OBJECTIVE

build the user interface by using HTML5 2.2

CHOOSE AND CONFIGURE HTML5 TAGS TO DISPLAY GRAPHICS

SCENARIO: The Fourth Coffee coffeehouse is working to increase the number of local residents that visit their coffeehouse by including a map of their Northamptonshire neighborhood on their website. Mark Harrington is the lead developer for the company. He has decided to use the new HTML5 canvas element to draw the map and highlight the walking routes to the coffeehouse.

1. What is the new syntax for the canvas tag?

- a. `<canvas name = "directions">`
- b. `<canvas id = "directions" width = "400" height = "500">`
- c. `<canvas width = "400" height = "500">`


2. What command is used to write the drawing to the canvas?

- a. `context.moveTo(0,0);`
- b. `context.lineTo(70,-70);`
- c. `context.stroke();`

3. How does the developer draw on the canvas?

- a. Using a script, such as JavaScript.
- b. Using native HTML5 commands.
- c. Inserting a previously created image.

HINT



If the drawing requires a large number of objects or is relatively small, it is better to use the canvas element rather than Scalable Vector Graphics (SVG).

Answers

1. What is the new syntax for the canvas tag?
 - b. `<canvas id = "directions" width = "400" height = "500">`. The canvas tag must have an id attribute to add it to the Document Object Model (DOM), and it should specify the dimensions of the canvas.
2. What command is used to write the drawing to the canvas?
 - c. `context.stroke()`. The lines, shapes, and text are not actually drawn to the canvas until either the stroke or fill command is applied to the context.
3. How does the developer draw on the canvas?
 - a. **Using a script, such as JavaScript.** The developer adds an ID to the canvas element so it can reference the canvas in the JavaScript. The script is used to actually create the drawing that is displayed on the canvas.

Essential details

- A **canvas** element is an object that is used for drawing, rendering, and manipulating images and graphics in a document.
- **Scalable Vector Graphics (SVG)**, a language for describing two-dimensional graphics in XML, allows for three types of graphic objects: vector graphic shapes (paths that consist of straight lines and curves), images, and text.
- A **transformation** is a modification layer that sits between the commands issued and the output on the canvas display. Commands include scale, translate, and rotate.

FAST TRACK HELP

- **Learn HTML5 in 5 Minutes**
<http://msdn.microsoft.com/en-us/hh549253>
- **HTML5 Graphics**
[http://msdn.microsoft.com/en-us/library/gg589511\(v=VS.85\).aspx](http://msdn.microsoft.com/en-us/library/gg589511(v=VS.85).aspx)
- **W3Schools**
<http://www.w3schools.com/html5>

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OBJECTIVE

build the user interface by using HTML5 2.3


CHOOSE AND CONFIGURE HTML5 TAGS TO PLAY MEDIA

SCENARIO: Coho Vineyard, located in Napa Valley, California, recently formed a partnership with a winery located along the Rhine River in Germany. The owner of Coho Vineyard just returned from a trip to Germany where he finalized the agreement between the two wineries. He was amazed at the beauty of the Rhine region, which he captured with his video camera.

To help highlight the new partnership, he wants to include a virtual tour of the Rhine region on the Coho website using his video footage from the trip and a voice overlay.

1. **What is the syntax for the new HTML5 video tag?**
 - a. `<video> </video>`
 - b. `<video source= "movie.mp4" controls = "controls"></video>`
 - c. `<video src= "movie.mp4" width = "350" height = "300" controls = "controls"></video>`
2. **How can the developer display a static image in place of the video while the video is downloading and prior to the user selecting play?**
 - a. Add a poster attribute to the video tag.
 - b. Add an image attribute to the video tag.
 - c. Add an src attribute.
3. **What optional attribute can be added to automatically start the video?**
 - a. play
 - b. autoplay
 - c. preload

HINT



To provide the best chance that the user's browser supports the video tag, provide multiple source files of various media types, such as .mp4 and .ogg.

Answers

1. What is the syntax for the new HTML5 video tag?
 - c. `<video src= "movie.mp4" width = "350" height = "300" controls = "controls">`
`</video>`. This syntax includes one video file with width and height attributes as well as video controls including play, pause, and stop.
2. How can the developer display a static image in place of the video while the video is downloading and prior to the user selecting play?
 - a. **Add a poster attribute to the video tag.** The poster attribute allow the developer to display an image when the video is not playing.
3. What optional attribute can be added to automatically start the video?
 - b. **autoplay.** The autoplay attribute starts the video as soon as it is available.

Essential details

- **Codec** is a technology used for compressing data. Audio and video codec compress and/or decompress digital audio data into different formats to retain the highest quality with minimum bit rate.
- **Data compression** reduces the amount of space or bandwidth needed to store or transmit a block of data.
- Programming languages are subject to certain **semantic** rules. A program statement can be syntactically correct but semantically incorrect; a statement can be written in an acceptable form and still convey the wrong meaning.
- **Video compression** reduces the size of files containing digital video images. If not compressed, 24-bit color video at 640 x 480 pixels would occupy almost one megabyte per frame, or over a gigabyte per minute.

FAST TRACK HELP

- **Learn HTML5 in 5 Minutes**
<http://msdn.microsoft.com/en-us/hh549253>
- **HTML5 Audio and Video**
[http://msdn.microsoft.com/en-us/library/gg589509\(v=VS.85\).aspx](http://msdn.microsoft.com/en-us/library/gg589509(v=VS.85).aspx)
- **W3Schools**
<http://www.w3schools.com/html5>



OBJECTIVE

build the user interface by using HTML5 2.4

CHOOSE AND CONFIGURE HTML5 TAGS TO ORGANIZE CONTENT AND FORMS

SCENARIO: Lucerne Publishing is located in Ontario, Canada. Recently the company decided to start an online magazine, and Etienne Jacques has been assigned the responsibility of creating the first web pages. Etienne plans to use the new HTML5 tags to organize the content on the page using the article, section, header, footer, and aside elements.

1. Which new tag is designed to be self-contained content?
 - a. `<section>`
 - b. `<article>`
 - c. `<header>`
2. What information is generally contained in the new footer tag?
 - a. The author of the document, copyright information, links to terms of use, and contact information
 - b. Citations and footnotes
 - c. Headings, subheadings, version information, and navigational controls
3. Which tag is used to display multiple levels of headings and subheadings?
 - a. `<header>`
 - b. `<hgroup>`
 - c. `<section>`

HINT

The new HTML5 tags are designed to increase accessibility and usability, so use the semantic tag instead of the older HTML4 tags whenever possible.

Answers

1. Which new tag is designed to be self-contained content?
 - b. **<article>**. This tag is used for magazine or newspaper articles, blog posts, and similar content.
2. What information is generally contained in the new footer tag?
 - a. **The author of the document, copyright information, links to terms of use, and contact information.**
3. What tag is used to display multiple levels of headings and subheadings?
 - b. **<hgroup>**. This tag can contain several headings and subheadings that range from <h1> to <h6>.

Essential details

- A **deprecated** element or attribute is one that has been outdated by newer constructs. Deprecated elements are defined in the reference manual in appropriate locations, but they are clearly marked as deprecated. Deprecated elements may become obsolete in future versions of HTML.
- Programming languages are subject to certain **semantic** rules. A program statement can be syntactically correct but semantically incorrect; a statement can be written in an acceptable form and still convey the wrong meaning.
- The **<section>** tag defines sections in a document, such as chapters, headers, and footers.
- The **<header>** tag specifies an introduction or a group of navigation elements for a document.

FAST TRACK HELP

- **Internet Explorer® Learning – HTML5**
<http://msdn.microsoft.com/en-us/ie/aa740476>
- **Internet Explorer 9 Developer Guide > HTML5 – Internet Explorer 9 Guide for Developers**
<http://msdn.microsoft.com/en-us/ie/hh410106>
- **W3Schools**
<http://www.w3schools.com/html5>



OBJECTIVE

build the user interface by using HTML5 2.5

CHOOSE AND CONFIGURE HTML5 TAGS FOR INPUT AND VALIDATION

SCENARIO: Adventure Works has a website that allows users to leave reviews of their recent trips to the Adventure Works playland. The webmaster, Michiyo, has noticed that some of the reviews from the site have invalid email addresses, and sometimes even the required fields are left empty. She decides that it is time to update this page with the new HTML5 tags, which will solve both of these problems.

1. What is the format for the HTML5 tag to validate an email address?

- a. `<input type = "url" name = "email">`
- b. `<input type = "text" id = "email">`
- c. `<input type = "email" name = "email">`

2. How can Michiyo make the form more user friendly?

- a. Add placeholder text.
- b. Add background colors.
- c. Add images.

3. What input attribute can she use to help the user enter a Japanese Postal Code (Format: nnn-nnnn)?

- a. `pattern="\d{3}-\d{4}"`
- b. `mask="\d{3}-\d{4}"`
- c. `postalCode="\d{3}-\d{4}"`

HINT



When using the new input types available with HTML5, use any available attributes that can help validate the user data.

Answers

1. What is the format for the HTML5 tag to validate an email address?
 - c. `<input type = "email" name = "email">`. The new input type 'email' validates the email address at the time it is entered.
2. How can Michiyo make the form more user-friendly?
 - a. **Add placeholder text.** This helps the user understand the expected format of the data to be entered into the input field.
3. What input attribute can she use to help the user enter a Japanese Postal Code (Format: nnn-nnnn)?
 - a. `pattern="\d{3}-\d{4}"`. The pattern attribute allows you to supply a format for the input field.

Essential details

- A name-value pair within a tagged element in markup languages such as SGML and HTML that modifies certain features of that element is called an **attribute**.
- **Validation** is the process of analyzing data to determine whether it conforms to predetermined completeness and consistency parameters.

FAST TRACK HELP

- **Better Web Forms with HTML5 Forms**
<http://msdn.microsoft.com/en-us/magazine/hh547102.aspx>
- **Making Forms Fabulous with HTML5**
<http://www.html5rocks.com/en/tutorials/forms/html5forms/>
- **HTML5Pattern**
<http://html5pattern.com/>



OBJECTIVE 3

Format the User Interface by Using CSS

IN THIS CHAPTER

- 3.1 Understand the core CSS concepts
- 3.2 Arrange user interface (UI) content by using CSS
- 3.3 Manage the flow of text content by using CSS
- 3.4 Manage the graphical interface by using CSS





OBJECTIVE

format the user interface by using CSS 3.1

UNDERSTAND THE CORE CSS CONCEPTS

SCENARIO: Sean Beasley is a web developer for Consolidated Messenger. He has been assigned the task of interviewing a summer intern to help with the company website. Sean prepared a few questions to ask during the interview. Read each of the following prepared questions, and identify the answer that Sean should expect from the candidate.

- 1. What are the parts of the CSS Box Model?**
 - a. Overflow, scrolling, visible, hidden
 - b. Float, absolute
 - c. Content, padding, margin, and border
- 2. What generic font families can be used to prevent potential viewing problems?**
 - a. Monospace, serif, sans-serif
 - b. Arial, Helvetica, Garmond
 - c. Times New Roman, Comic Sans
- 3. What properties can be set to control overflow when using block flow?**
 - a. Yes, no
 - b. Height, width
 - c. Scroll, visible, hidden

HINT



Adding Cascading Style Sheets (CSS) takes extra time in the beginning, but it is worth it in the end.

Answers

1. What are the parts of the CSS Box Model?
c. **Content, padding, margin, and border.**
2. What generic font families can be used to prevent potential viewing problems?
a. **Monospace, serif, sans-serif**
3. What properties can be set to control overflow when using block flow?
c. **Scroll, visible, hidden**

Essential details

- **Cascading style sheets** (CSS) is a Hypertext Markup Language (HTML) specification developed by the World Wide Web Consortium (W3C) that allows authors of HTML documents and users to attach style sheets to HTML documents. The style sheets include typographical information on how the page should appear, such as the font of the text on the page.
- A set of characters of the same typeface (such as Garamond), style (such as italic), and weight (such as bold) is called a **font**. A font consists of all the characters available in a particular style and weight for a particular design; a typeface consists of the design itself. Fonts are used by computers for onscreen displays and by printers for hard-copy output.
- **Typography** is the art of font design and typesetting.

FAST TRACK HELP

- **Internet Explorer® Learning**
<http://msdn.microsoft.com/en-us/ie/gg593671>
- **Cascading Style Sheets**
[http://msdn.microsoft.com/en-us/library/ms531205\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/ms531205(v=vs.85).aspx)
- **W3Schools**
<http://www.w3schools.com/css/default.asp>




OBJECTIVE

format the user interface by using CSS 3.2

ARRANGE USER INTERFACE (UI) CONTENT BY USING CSS

SCENARIO: Diane Prescott has updated several existing websites to use the new HTML5 tags, and now she wants to explore the advantages of using Cascading Style Sheets 3 (CSS3) as it pertains to the user interface (UI). In the past, Diane has struggled with the unexpected results of using the float property. A colleague told her about the new Flexible Box Model that provides a fluid layout, even when using different screen and browser window sizes, without using float. She decides to use the *www.w3schools.com* tutorial for CSS3 as a starting point.

1. **CSS has several vendor-specific prefixes to help accommodate the transition to CSS3. What are valid prefixes for Firefox, Internet Explorer®, and Safari?**
 - a. -firefox-, -microsoft-, -safari-
 - b. -Ffox-, -Msoft-, -Saf-
 - c. -moz-, -ms-, -webkit-
2. **What box property is used to set the direction of the content?**
 - a. box-direction
 - b. box-align
 - c. .box-orient
3. **How can Diane ensure that extra whitespace in a browser window is equally distributed to the size of multiple child elements?**
 - a. box-pack
 - b. box-align
 - c. box-direction

HINT 

To keep up with the changing status of HTML tags, review the CSS3 Browser Support Reference: http://www.w3schools.com/cssref/css3_browsersupport.asp

Answers

1. CSS has several vendor-specific prefixes to help accommodate the transition to CSS3. What are valid prefixes for Firefox, Internet Explorer, and Safari?
c. -moz-, -ms-, -webkit-
2. What box property is used to set the direction of the content?
a. box-direction
3. How can Diane ensure that extra whitespace in a browser window is equally distributed to the size of multiple child elements?
a. box-pack

Essential details

- **Cascading Style Sheets (CSS)** is a Hypertext Markup Language (HTML) specification developed by the World Wide Web Consortium (W3C). The style sheets include typographical information on how the page should appear, including elements such as text font.
- Some container elements on an HTML page contain other containers. This is referred to as a **parent/child relationship**. The parent element may have none, one, or many children.
- The **flexbox** layout takes the available space into account when defining box dimensions, which enables relative sizes and positioning.
- A **user interface** is the portion of a program or website with which a user interacts.

FAST TRACK HELP

- **HTML Rocks**
<http://www.html5rocks.com/en/tutorials/flexbox/quick/>
- **Flexible box ("Flexbox") Layout**
[http://msdn.microsoft.com/en-us/library/hh673531\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/hh673531(v=vs.85).aspx)
- **W3Schools**
<http://www.w3schools.com/cssref/default.asp#flexbox>

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OBJECTIVE

format the user interface by using CSS 3.3

MANAGE THE FLOW OF TEXT CONTENT BY USING CSS

SCENARIO: Michael Affronti is the marketing manager at Woodgrove Bank in Naples, Italy. Each month he writes a newsletter to inform customers about the latest financial news, suggestions for managing their money, and special bank offers. To reach a wider audience, Michael has decided to publish the newsletter on the Woodgrove Bank website. He is aware of the many changes coming with HTML5 and Cascading Style Sheets 3 (CSS3) and wants the web developer to employ the latest techniques in the newsletter.

1. To arrange the content in the newsletter, Michael wants the web developer to use columns that will scale based on the user's screen size. What new CSS3 style can be used?
 - a. `newsletter`
 - b. `column-count`
 - c. `hyphenation`
2. What CSS style can be used to wrap text and other content around specific elements?
 - a. `wrap-text`
 - b. `box-align`
 - c. `positioned-floats`
3. To make the newsletter appear professional, Michael wants the text to be fully justified. However, he is concerned that longer words will cause the text to appear stretched. How can the developer correct this problem?
 - a. CSS3 style for hyphens
 - b. CSS3 style for text-align
 - c. CSS3 style for padding

HINT 

HTML5 and CSS3 are changing and developing quickly. Check W3C for current information.

Answers

1. To arrange the content in the newsletter, Michael wants the web developer to use columns that will scale based on the user's screen size. What new CSS3 style can be used?
b. column-count
2. What CSS3 style can be used to wrap text and other content around specific elements?
c. positioned-floats
3. To make the newsletter appear professional, Michael wants the text to be fully justified. However, he is concerned that longer words will cause the text to appear stretched. How can the developer correct this problem?
a. CSS3 style for hyphens

Essential details

- **Content** is the data that appears between the starting and ending tags of an element in an SGML, XML, or HTML document.
- A World Wide Web Consortium specification that describes the structure of dynamic HTML and XML documents in a way that allows them to be manipulated through a web browser is the **Document Object Model**, or **DOM**. This document is presented as a logical structure rather than as a collection of tagged words.
- **Hyphenation** is the process of adding a punctuation mark (-) to break a word between syllables at the end of a line or to separate the parts of a compound word. This feature is normally associated with word processing applications, but the newest version of CSS3 provides this new property for web design.
- **Pagination** is the process of dividing a document into pages.

FAST TRACK HELP

- **Regions, Hyphenation, Multi-Column Layout**
[http://msdn.microsoft.com/en-us/library/hh673536\(v=VS.85\).aspx](http://msdn.microsoft.com/en-us/library/hh673536(v=VS.85).aspx)
- **Windows Dev Center Positioned Floats**
<http://msdn.microsoft.com/en-us/library/windows/apps/hh453704.aspx>
- **W3Schools**
<http://www.w3schools.com/cssref/default.asp#multicol>

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OBJECTIVE

format the user interface by using CSS 3.4

MANAGE THE GRAPHICAL INTERFACE BY USING CSS

SCENARIO: The monthly newsletter for Woodgrove Bank is now online. Michael Affronti, the marketing manager, wants the site to have a “softer” look and has suggested that the sharp corner borders be changed to rounded borders. In addition, he wants the font used on the site to be the same as font style that is used on the bank’s printed materials, such as the letterhead and statements, to maintain the official bank corporate identity.

1. **What CSS3 property creates rounded borders?**
 - a. border-size
 - b. border-rounded
 - c. border-radius
2. **Which statement should the developer use to include a font that is not pre-installed on client machines?**
 - a. @font-face
 - b. includeFont
 - c. font-family
3. **What SVG filter would create the effect shown in the following image?**
 - a. feBlur
 - b. feGaussianBlur
 - c. feBlend

HINT 

Microsoft® Internet Explorer® typically supports font files with .eot extensions. Other font files must be converted for broader access by client computers.

Answers

1. What CSS3 property creates rounded borders?
c. border-radius. The radius is usually a length expressed in pixels.
2. Which statement should the developer use to include a font that is not pre-installed on client computers?
a. @font-face. This statement allows the developer to include the font with the site.
3. What SVG filter would create the effect shown in the following image?
b. feGaussianBlur

Essential details

- **SVG** is an acronym for Scalable Vector Graphic.
- **Typography** is the art of font design and typesetting.
- **Translating** an image involves moving an image in the display “space” without turning (rotating) the image.
- **WOFF** (Web Open Font Format) files allow web developers to use custom fonts instead of the standard web fonts. WOFF files are typically compressed TTF files with additional metadata.

FAST TRACK HELP

- **Microsoft Typography**
<http://www.microsoft.com/typography/WEFT.msp>
- **How to Add Rounded Corners with CSS**
<http://msdn.microsoft.com/library/gg589503.aspx>
- **W3Schools**
<http://www.w3schools.com/css3/default.asp>



OBJECTIVE 4

Code by Using JavaScript

IN THIS CHAPTER

- 4.1 Manage and maintain JavaScript
- 4.2 Update the UI by using JavaScript
- 4.3 Code animations by using JavaScript
- 4.4 Access data access by using JavaScript
- 4.5 Respond to the touch interface
- 4.6 Code additional HTML5 APIs
- 4.7 Access device and operating system resources





OBJECTIVE

code by using javascript 4.1

MANAGE AND MAINTAIN JAVASCRIPT

SCENARIO: The web has changed drastically in recent years, including the addition of personalized messages on sites that contain a sign-in feature. Michael Affronti, marketing manager at Woodgrove Bank in Naples, Italy, has decided that he wants to add personalization to the bank's website. He has been working with the web developer who is trying to help Michael understand how they can use JavaScript to make the site more interactive and personalized.

Using JavaScript allows the developer to include the user's name and provide a personalized message. It is also a good tool for making the site more dynamic by using built-in functions to obtain the current date, validate form fields, and much more.

1. Which variable name is valid in JavaScript?
 - a. `todaysDate`
 - b. `1January`
 - c. `First!Name`
2. Which JavaScript built-in function tests for a numeric value?
 - a. `isNumber()`
 - b. `isNaN()`
 - c. `isValid()`
3. What is the correct syntax for defining a new variable in JavaScript?
 - a. `new var firstName;`
 - b. `var lastName;`
 - c. `var int number;`

HINT



JavaScript is case sensitive, so the two variables `firstName` and `FirstName` are NOT the same.

Answers

1. Which variable name is valid in JavaScript?
 - a. **todaysDate**. Names cannot start with a number, and they cannot have any special symbols except underscore.
2. Which JavaScript built-in function tests for a numeric value?
 - b. **isNaN()**. This method is used to test for “not a number”; a return of 0 (false) indicates that the value is a number.
3. What is the correct syntax for defining a new variable in JavaScript?
 - b. **var lastName**; JavaScript does not include the keyword “new”, and it does not include a data type such as “int” (integer).

Essential details

- **Animation** is the creation of moving images (animation) using computer technology.
- Website or blog content that changes frequently and engages the reader, or content that includes animations, video, or audio, is called **dynamic**.
- **Interactive** describes a website that involves the exchange of information or instructions between a person and a machine such as a computer.

FAST TRACK HELP

- **JavaScript Fundamentals**
[http://msdn.microsoft.com/en-us/library/6974wx4d\(v=VS.94\).aspx](http://msdn.microsoft.com/en-us/library/6974wx4d(v=VS.94).aspx)
- **W3 Schools JavaScript Tutorial**
<http://www.w3schools.com/js/default.asp>
- **jQuery Documentation**
http://docs.jquery.com/Main_Page



OBJECTIVE

code by using javascript 4.2


UPDATE THE UI BY USING JAVASCRIPT

SCENARIO: Michael Affronti, marketing manager at Woodgrove Bank in Naples, Italy, is impressed with the new personalization of the bank's website that was created using JavaScript. Customers have been commenting on the attractiveness and user-friendliness of the revised site.

He asked the developer about other changes that can be made with JavaScript to enhance the appeal of the site and make customers even happier. The developer recommended using features to update the UI, such as showing and hiding elements, updating the content of elements, and adding new elements.

1. **What mouse event handler triggers the JavaScript code when the user presses the mouse button?**
 - a. `onmousedown`
 - b. `onmouseover`
 - c. `onmousemove`
2. **Which JavaScript command is used to locate and access an element on the page?**
 - a. `getHTMLTag(tagname)`
 - b. `getElementById(idname)`
 - c. `getElement(name)`
3. **Which JavaScript command is used to dynamically add new elements?**
 - a. `new element(tag);`
 - b. `createElement(tag);`
 - c. `createNewTag(tag);`

HINT



After an element is located, JavaScript can be used to add to it, change it, or remove it from the page.

Answers

1. What mouse event handler triggers the JavaScript code when the user presses the mouse button?
a. `onmousedown`
2. Which JavaScript command is used to locate and access an element on the page?
b. `getElementById(idname)` You can use both `getElementById()` or `getElementsByTagName()`.
3. Which JavaScript command is used to dynamically add new elements?
b. `createElement(tag);`

Essential details

- **Dynamic content** changes frequently and engages the reader; it can include animations, video, and audio.
- Any content contained between the tags, and any attributes the tags may have, is referred to as an **element**. Elements can be nested, one within the other.
- An action that is often generated by the user to which a program might respond—for example, key presses, button clicks, or mouse movements—is called an **event**.
- **Interactive** websites involve the exchange of information or instructions between the user and the site.

FAST TRACK HELP

- **JavaScript Fundamentals**
[http://msdn.microsoft.com/en-us/library/6974wx4d\(v=VS.94\).aspx](http://msdn.microsoft.com/en-us/library/6974wx4d(v=VS.94).aspx)
- **W3 Schools JavaScript Tutorial**
<http://www.w3schools.com/js/default.asp>
- **W3 Schools JS & DOM Reference**
http://www.w3schools.com/jsref/dom_obj_event.asp



OBJECTIVE


code by using javascript 4.3

CODE ANIMATIONS USING JAVASCRIPT

SCENARIO: Isabel Martin is in charge of the website for Tailspin Toys. The current site provides information about Tailspin products and allows users to shop online. Isabel realizes that the site is currently designed for adults who are interested in purchasing toys for children.

Isabel's supervisor has asked her to update the site to make it more attractive to children who are shopping for themselves. Isabel suggests adding some animation and simple games. Her supervisor likes the ideas and has asked her to provide more details on the type of animation she has in mind.

- 1. What is the benefit of using animation libraries to add animations to a site?**
 - a. No knowledge of JavaScript is required.
 - b. Reduces development time by reusing existing functions.
 - c. Does not require any additional programming.
- 2. What part of the HTML code should include the statements to import existing JavaScript files such as jQuery?**
 - a. <head>
 - b. <body>
 - c. <include>
- 3. What libraries should Isabel review to learn more about adding animation to the site?**
 - a. GUI, JavaScript
 - b. Windows Library, jQuery
 - c. Animation, WYSIWYG

HINT 

Before spending time writing the code for an animation, look for a library that might contain the required functionality.

Answers

1. What is the benefit of using animation libraries to add animations to a site?
b. Reduces development time by reusing existing functions.
2. What part of the HTML code should include the statements to import existing JavaScript files such as jQuery?
a. <head>
3. What libraries should Isabel review to learn more about adding animation to the site?
b. Windows Library, jQuery.

Essential details

- **Animation** is the illusion of movement created by using a succession of static images. In computer graphics, the images can be drawn separately, or the starting and ending positions can be drawn with the intervening images provided by software.
- **Recursion** is the ability of a routine to call itself. It enables certain algorithms to be implemented with small, simple routines, but it does not guarantee speed or efficiency.

FAST TRACK HELP

- **Animating your UI**
<http://msdn.microsoft.com/en-us/library/windows/apps/hh465165.aspx>
- **jQuery API**
<http://api.jquery.com/animate/>
- **SourceCodeOnline - JavaScript**
<http://www.sourcecodeonline.com/sources/javascript.html>



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OBJECTIVE

code by using javascript 4.4

ACCESS DATA ACCESS BY USING JAVASCRIPT

SCENARIO: The owner of Alpine Ski Resorts has seen a rise in the number of hits on the resort website and realizes that the website is a great way to communicate with the skiers, tubers, and snowboarders who visit Alpine Ski Resorts.

The new web designer has suggested that the site include information about current slope conditions, temperatures, and other important ski-condition information. To allow the user quick access to the information, she has decided to use JavaScript Object Notation (JSON) to store the information for each slope.

She is also including the URL for the JavaScript file that contains the slope information in the AppCache.

- 1. What is a benefit of using AppCache?**
 - a. It allows the user to save the application to the client computer.
 - b. It saves a manifest of URLs in a text file available offline.
 - c. It provides an indexed database of information used by the client.
- 2. How can developers use a blob in their web design?**
 - a. To access and save text files.
 - b. To store structured data that can be indexed and searched.
 - c. To open a connection to the server.
- 3. What new HTML5 database allows developers to store structured data on the client computer?**
 - a. Relational database
 - b. Indexed database
 - c. Structured database

HINT 

Some of the topics discussed in this lesson are still a work in development. Check the current status on the W3C website: www.w3c.org.

Answers

1. What is a benefit of using AppCache?
 - b. **It saves a manifest of URLs in a text file available offline.** The developer identifies URLs stored in the AppCache so the user can work in an offline state.
2. How can developers use a blob in their web design?
 - a. **To access and save text files.** A blob is a binary large object and is used to store a string of data that can be parsed and used by the web page.
3. What new HTML5 database allows developers to store structured data on the client computer?
 - b. **Indexed database.** The indexed database is new with HTML5. It gives the developer access to a client database; this reduces response time, because it does not always need to send a request to the server and wait for a response.

Essential details

- An **array** is a list of data values, all of the same type, any element of which can be referenced by an expression consisting of the array name followed by an indexing expression. Arrays are fundamental data structures, which, in turn, are a fundamental of computer programming.
- A **blob**, short for Binary Large Object, represents a chunk of data.
- Large segments of data are often **parsed** or divided into smaller segments so that a program can act upon the information or data.

FAST TRACK HELP

- **IndexedDB**
[http://msdn.microsoft.com/en-us/library/hh673548\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/hh673548(v=vs.85).aspx)
- **JSON Tutorial**
<http://www.w3schools.com/json/default.asp>
- **HTML5 Rocks and File API**
<http://www.html5rocks.com/en/tutorials/file/filesystem/>



OBJECTIVE

code by using javascript 4.5

RESPOND TO THE TOUCH INTERFACE

SCENARIO: Tailspin Toys just added some animations to their website to make the site more user-friendly and attractive to children and adults. Isabel Martin is responsible for maintaining the website and analyzing website statistics and analytics. She has discovered that the new animations are attracting more customers and that many of the customers are viewing the website using touch-enabled devices. This is her opportunity to include technology that will enhance the users' touch experience.

1. **What can the developer use to test for the rotation of the physical device?**
 - a. `changedirection`
 - b. `onrotate`
 - c. `orientationchange`
2. **What gesture is used to increase the size of the screen display?**
 - a. `pinchopen`
 - b. `pinchclose`
 - c. `doubletap`
3. **What technique registers that the user is rotating an image on the screen?**
 - a. A gesture, which is touching the screen with two fingers.
 - b. Touch events to indicate the start and stop of the rotation.
 - c. The user cannot rotate an image using touch-enable technology.

HINT

Remember that touch events do not create a single (x,y) coordinate point; they create a list of information for every finger currently touching the screen.

Answers

1. What can the developer use to test for the rotation of the physical device?
c. **orientationchange**
2. What gesture is used to increase the size of the screen display?
a. **pinchopen**
3. What technique registers that the user is rotating an image on the screen?
a. **A gesture, which is touching the screen with two fingers**

Essential details

- Touchscreen and mobile events are considered **gesture** events.
- Each event has a numeric value representing the **scale** and **rotation** values.
- A **touch gesture** is a movement of a finger or stylus over a control or object on the screen.
- Simple finger touches trigger a **touchstart** event. When the finger is released, a **touchend** event is triggered. In the interim, the **touchmove** event is used to track the finger movement.
- The rotation gesture is captured as degrees of the finger rotation.
- A change in the orientation triggers an **orientationchanged** event.

FAST TRACK HELP

- **Touch Gestures**
<http://msdn.microsoft.com/en-us/library/ee499124.aspx>
- **jQuery**
<http://archive.plugins.jquery.com/plugin-tags/gesturestart>
- **Mobile Touch Events in MooTools 1.3**
<http://davidwalsh.name/mootools-touch>



OBJECTIVE

code by using javascript 4.6

CODE ADDITIONAL HTML5 APIS

SCENARIO: The City Power and Light Company is experiencing stiff competition and needs to become more customer-focused. With the help of a focus group, they are evaluating new ideas for meeting energy consumers' needs in regard to customer service. They have decided to create a website from which customers can find the field office closest to their home, engage in instant chat messaging with the Help Desk, and access up-to-date reports on their residential power usage.

1. **What API can be used to provide a chat application?**
 - a. WebSockets
 - b. JavaScript
 - c. web workers
2. **What technology will enable the City Power and Light Company to identify the current location of its customers?**
 - a. webSockets
 - b. geolocation
 - c. gpslocator
3. **The company has an application that can analyze customer power usage, but it is very slow. How can the company improve the website response time?**
 - a. JavaScript
 - b. WebSockets
 - c. web workers

HINT



When a long-running JavaScript does not need to be part of the DOM, use a web worker and run the program in the background.

Answers

1. What API can be used to provide a chat application?
c. WebSockets
2. What technology will enable the City Power and Light Company to identify the current location of its customers?
b. geolocation
3. The company has an application that can analyze customer power usage, but it is very slow. How can the company improve the website response time?
c. web workers

Essential details

- The **GeoLocation API** (Application Programming Interface) is used to find the latitude and longitude of a web user.
- **Geodetic** data provides longitude and latitude, meters, and similar data.
- **Civic** data is considered “human readable,” such as “Lewistown, 3rd Floor.”
- **Web workers** allow JavaScripts to run in the background as parallel threads.
- **WebSockets** provide a new JavaScript API and protocol for two-way communication over the Internet.

FAST TRACK HELP

- **HTML5 Rocks - Geolocation API**
http://www.html5rocks.com/en/tutorials/geolocation/trip_meter/
- **HTML5 Rocks – The Basics of Web Workers**
<http://www.html5rocks.com/en/tutorials/workers/basics/>
- **Geolocation**
[http://msdn.microsoft.com/en-us/library/gg589499\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/gg589499(v=vs.85).aspx)



OBJECTIVE

code by using javascript 4.7

ACCESS DEVICE AND OPERATING SYSTEM RESOURCES

SCENARIO: Martha works in a retail phone store. She has seen amazing changes in mobile technology over the past few years and expects to see even more exciting developments. She knows that her future in the field of mobile technology is bright.

More and more features are being added to mobile devices, even as they are becoming less expensive. Consumers have access to a wide variety of choices of devices, device features, and mobile applications. Phone features include touch-sensitive devices, cameras, and geolocation capabilities that can even determine the speed at which the device is travelling.

- 1. What mobile device resource detects the force of gravity as well as any forces resulting from the movement of the device?**
 - a. Gyroscope
 - b. Accelerometer
 - c. Calibrator
- 2. What operating system environment allows the developer to access new device technology such as a camera or microphone?**
 - a. WinRT
 - b. Internet Explorer®
 - c. JavaScript
- 3. What information is held in the memory resources of mobile devices?**
 - a. Photos
 - b. Application Cache
 - c. Contact lists and calendars

HINT



When accessing any device information, it is important to get permission from the user to access the data.

Answers

1. What mobile device resource detects the force of gravity along with any forces resulting from the movement of the device?
b. Accelerometer
2. What operating system environment allows the developer to access new device technology such as a camera or microphone?
a. WinRT
3. What information is held in the memory resources of mobile devices?
c. Contact lists and calendars

Essential details

- GPS (Global Positioning System) hardware provides precise location information in longitude and latitude notation. This device is often used to support the **Geolocation API**.
- An **accelerometer** is a device that measures acceleration—a change in speed over time.
- A program, interface, or protocol that supports software operations that produce similar results on a wide variety of hardware is called **device independent**.
- Using the **Windows® Runtime**, a developer can request access to a user's device such as a webcam.

FAST TRACK HELP

- **The Windows Runtime**
<http://msdn.microsoft.com/en-us/library/windows/apps/hh464942.aspx>
- **Accelerometer Overview**
[http://msdn.microsoft.com/en-us/library/ff431810\(v=vs.92\).aspx](http://msdn.microsoft.com/en-us/library/ff431810(v=vs.92).aspx)
- **W3C DeviceOrientation Event Specification**
<http://dev.w3.org/geo/api/spec-source-orientation.html>

