CP1406 – Week 3
Design Principles
Enhancing a Website with Links and Images

JAMES COOK UNIVERSITY
AUSTRALIA

Design Principles - Design Process

- Somewhere between art, science, and problem-solving
- The process of creating a **design comp** ("**comprehensive dummy**")
  can be boiled down to:
  - discovery
  - exploration
  - implementation

Discovery

- Meeting and learning about the client(s)
- Gathering information, desires, goals…

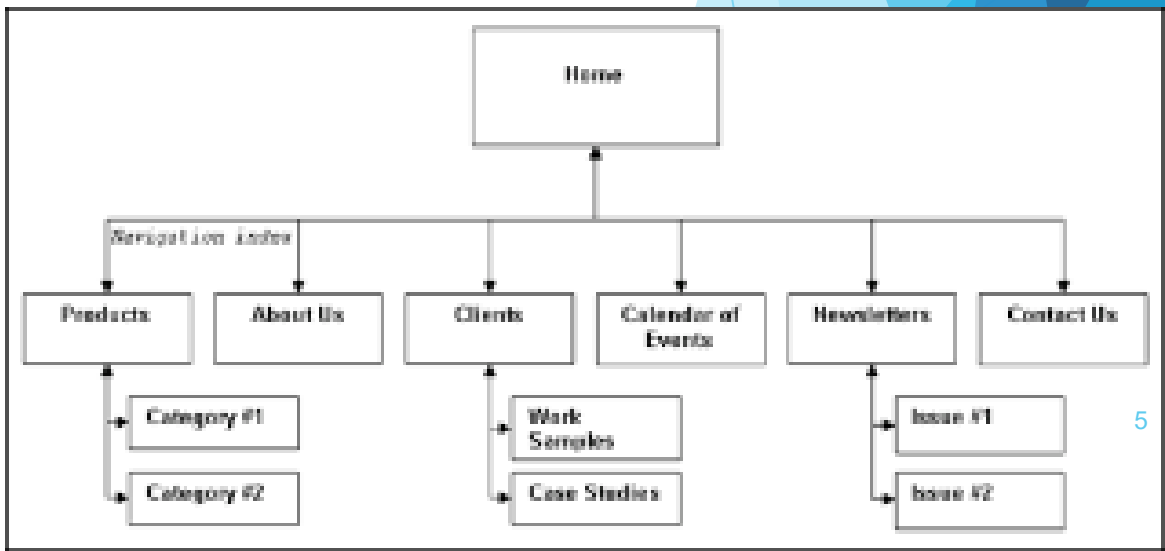
- What questions should you ask a client?

Exploration (using the information from the client)

- Put yourself in the shoes of the website visitors and ask yourself what they are looking for
  - Thinking about buying a product…
    - what do you need to know before you buy?
  - Signing up for a service…
    - where would you learn about the different offerings and which option you need?
  - What is the clearest title possible for page x?
  - How many steps does it take to reach page y?

Information Architecture (IA)

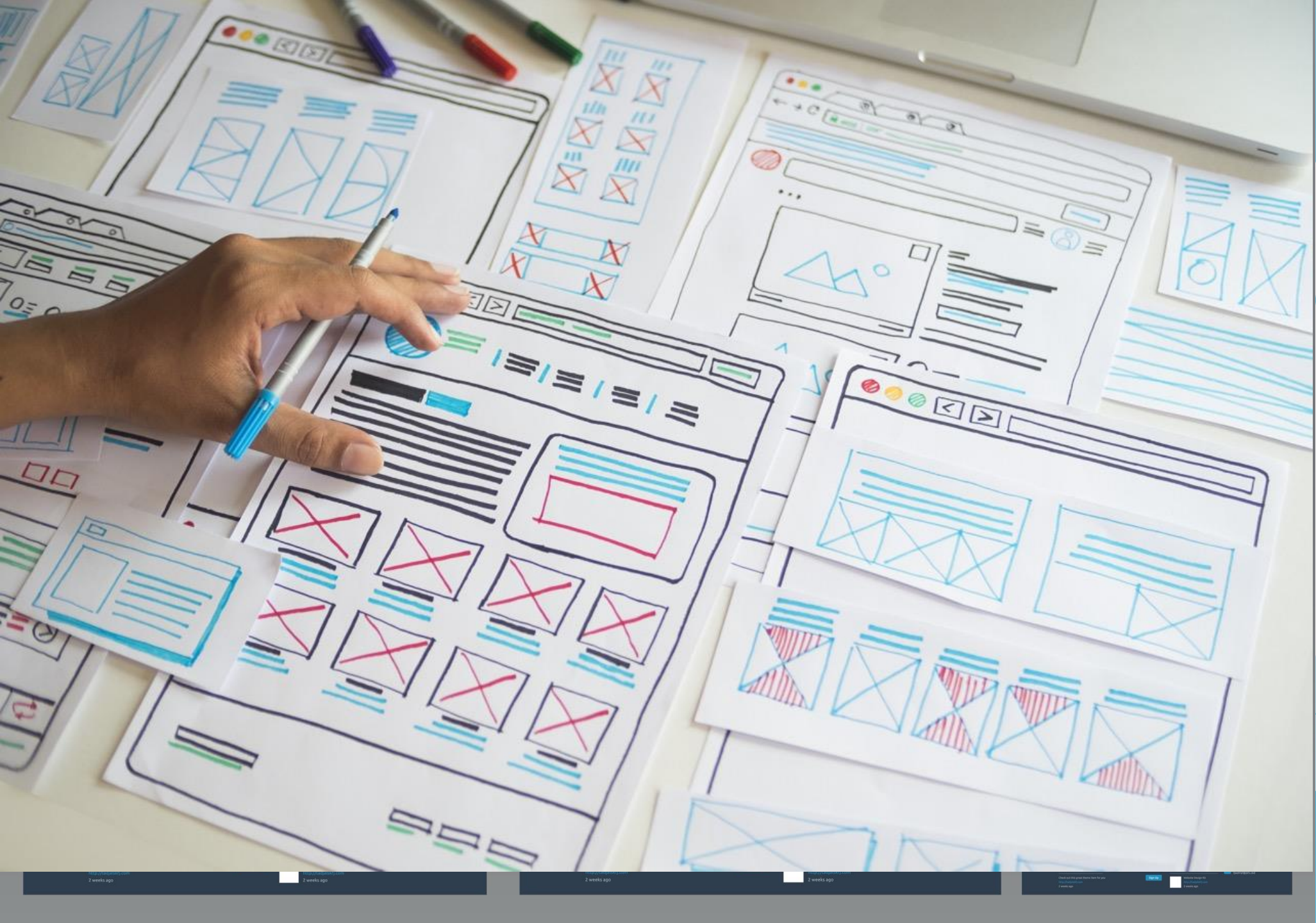
- Focus on organising the content and flow of the website into a logical structure
- Make a list of all the bits and pieces of the site and start arranging them into groups
  - Use paper, sticky notes or a whiteboard – or a digital tool that lets you move things easily
- Turn this into a flowchart
  - Every box is a page
  - Every line (arrow) is a link
  - The order matches the site



Planning should be useful

Implementation - Creating a layout

- Use… paper!
  - Too easy to lose focus when using a computer
- Sketch a few possible layouts
- Use (something like) Photoshop to block out the planned areas
- Experiment with foreground and background colours
- Keep tweaking until you have a comp you can show the client



Defining Good (& Bad) Design

- Two ways of looking at it:
  - Strict **usability** angle
    - functionality, the effective presentation of information, and efficiency
  - Purely **aesthetic** perspective
    - artistic value and visual appeal of the design

- Goal: **maximise both**

Design is about communication

- The elements and functionality of a finished website design should work together, so that:
  - Users are pleased by the design but drawn to the content
  - Users can move about easily via intuitive navigation
  - Users recognise each page as belonging to the site

Cohesive Design

- Have a unified/cohesive theme or style
- Helps hold the design together across whole site
- Users should never think they've left the site

How can we make site designs **cohesive**?


UNIVERSITY OF SOUTH CAROLINA
Darla Moore School of Business
University Home
Alumni
Student Life
News
Events
Visit
Search
SUPPORT
Academic Programs
Faculty & Research
Corporate Solutions
Career Management
About
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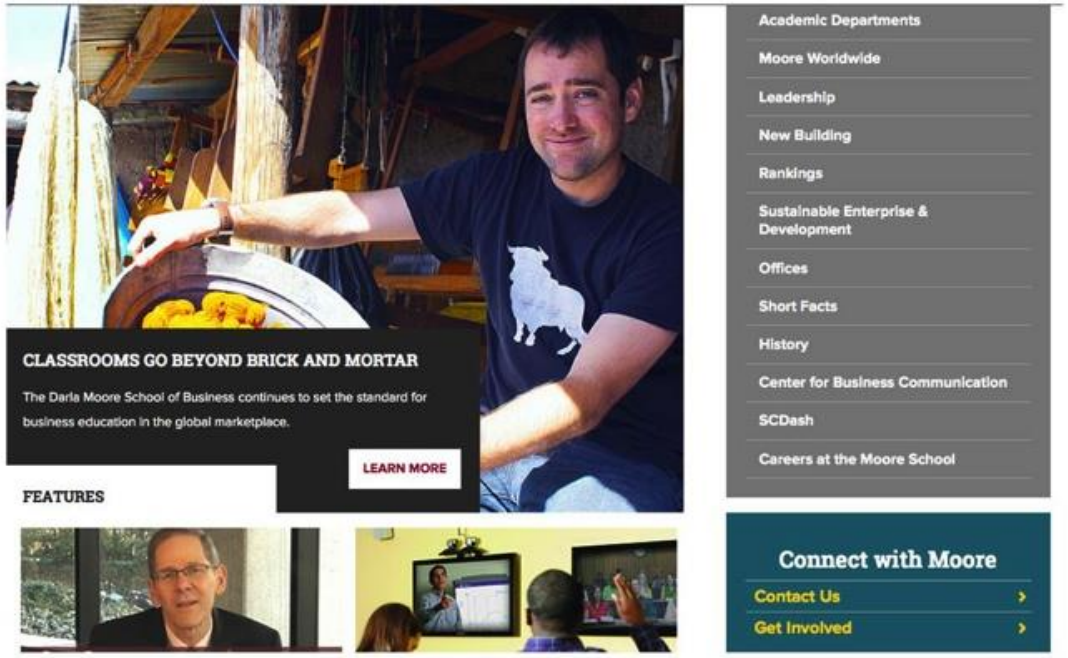
Academic Programs
Faculty & Research
Corporate Solutions
Career Manag
Faculty & Research
MEET DEAN PETER BREWS
An interview and video with Dr. Peter Brews, the new Moore School dean.
Faculty & R
Faculty
Knowledge At Moor
Research Centers
SC Economic Data
Research Support
EVENTS
Include all Categories
Rio de Janeiro Alum
MARCH 14, 2014
#1 Celebration
MARCH 19, 2014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How to create a cohesive design

- Consistency and repetition create smooth transitions (no "jumps" in layout)
- Reinforce identifying elements
  - e.g., logo in the same top-left spot on every page
- Place navigation elements in the same position on each page
- Use the same navigation graphics throughout the site
- Use a consistent colour scheme

Proximity

Unity - Proximity

- Placing elements closer together (compared to other elements) makes them appear related

augue duis dolore te feugait nulla.Ea commodo consequat. Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volut. Ut wisi enim ad minim veniam, quis nosrud exerci tation ullamcorper.Ullamcorper ut aliquip ex ea commodo consequat.

Unkgnome

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Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugait nulla.Ea commodo consequat. Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper.Ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat.

Gnomenclature

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Unity - Proximity

- What's wrong with this form?

Please choose your age:

< 10 11-16 17-25 26-37 38-50 > 50

- This is much better:

Please choose your age:

< 10 11-16 17-25 26-37 38-50 > 50

```
.proximityDemo input { margin-left: 1em; }
```


Images - Introduction

- Images (photos, drawings, diagrams, charts…) are used to enhance visual appeal and provide visitors with additional information about a product or service (content)
- Images can also help establish a “feel”
  - Break up text and contribute to the design and aesthetics of a website
  - Support the purpose of the webpage

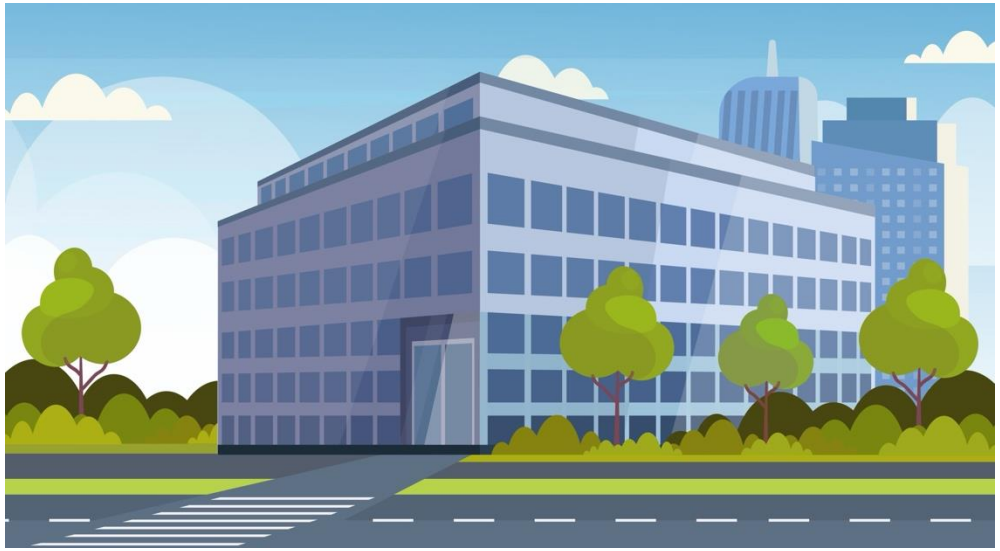


Image File Formats

- Several file formats exist for storing images
- These formats all compress images to create smaller files
- Knowing which file format to use for which type of image is important

Format	Pros	Cons	Use for
GIF	Small file size; supports transparency and animation	Limited to 256 colours	Line drawings and animations
PNG	Small file size; supports transparency and millions of colours	Does not support animation	Images that are not digital photos
JPG	Supports millions of colours	~~Larger file size~~	Digital photos
SVG	Flexible; scalable; no files needed because graphics are created with code	Not supported by older browsers and not all modern browsers support all SVG features	Shapes, lines, text, and gradients

GIF - Graphics Interchange Format

- GIF uses **lossless** compression technique, meaning that no colour information is discarded when the image is compressed
- 8-bit colour depth = no more than 256 colors
- GIF excels at compressing and displaying flat color areas, making it good for line art and simple color graphics
- GIF uses a kind of Run Length Encoding (RLE)
- It compresses horizontal runs of the same colour well
- Vertical lines, smooth changes (gradients), etc. do not compress well

JPG – Joint Photographic Experts Group

- JPG is usually best for photographs or continuous tone images
- JPGs are 24-bit RGB images that allow millions of colors
- JPGs use **lossy** compression routine especially designed for photographic images
  - When the image is compressed, some color information is discarded, resulting in a loss of quality from the original image
  - This is OK. Many photos can sustain quite a bit of compression while still maintaining image integrity

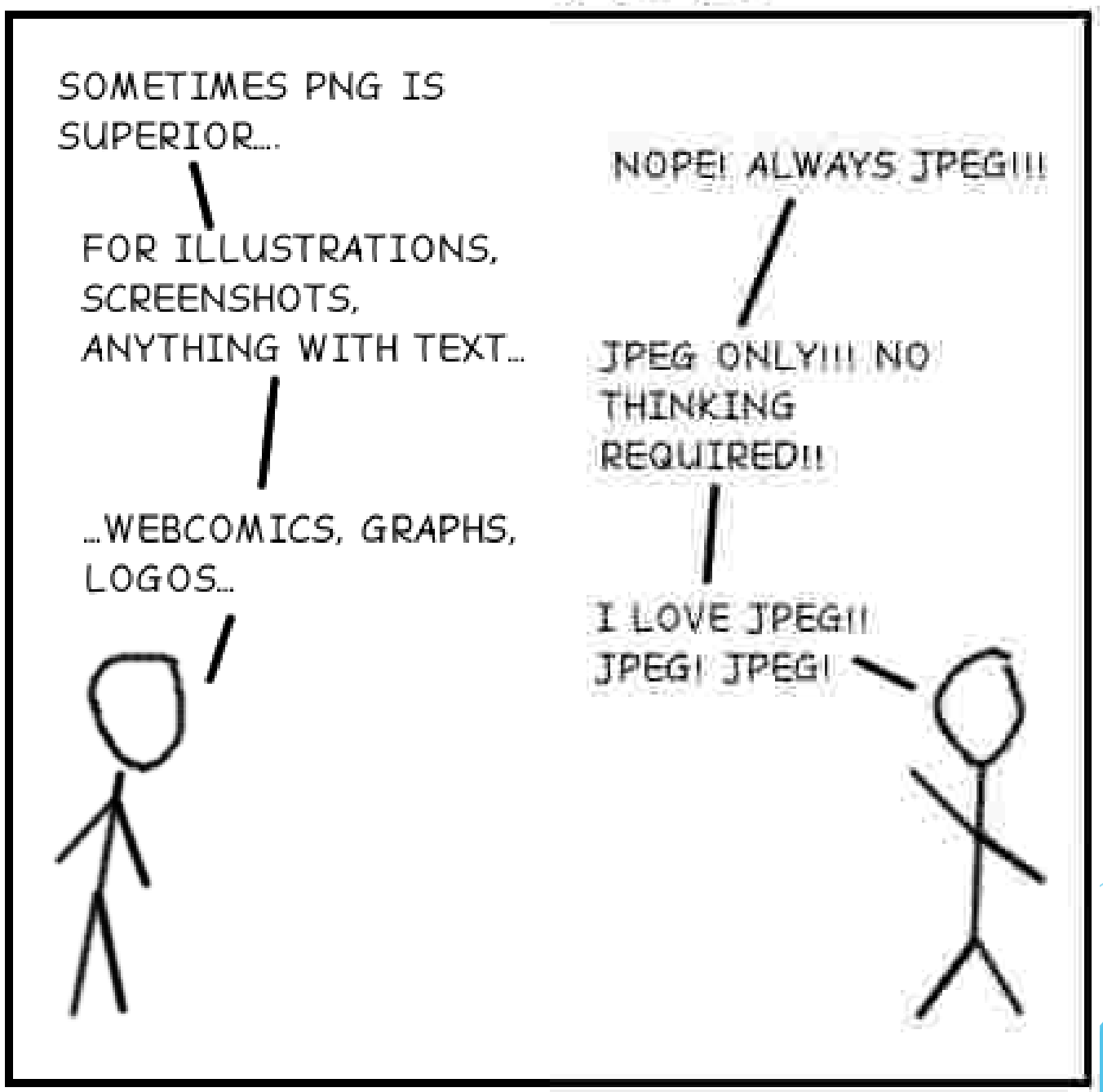
JPEG Compression

- JPEG uses an interesting technique involving:
  - segmenting the image into 8*8 pixel sections
  - converting each section to the frequency domain using the Discrete Cosine Transformation (DCT) – because this can be compressed well
  - compressing the section based on the quality factor, reduces the "high frequency" information, losing quality but saving considerable space
- Displaying the image involves the reverse – converting from the data from the frequency to the spatial domain
- In short, JPEG compression works best for images that have gradual changes in colour (low frequency data), such as… photographs but NOT text or hard-edged things, etc.

PNG - Portable Network Graphic

- A royalty-free file format intended to replace GIF
  - GIF uses proprietary (not free) LZW compression
- PNG supports transparency and interlacing but not animation
- Compresses 8-bit images to smaller file sizes than GIF
- PNG uses the lossless DEFLATE compression technique used in ZIP files
  - Duplicate string elimination - replaces repeated strings with a back-references linking to it (shorter than the repeated string)
  - Bit reduction using Huffman coding - replaces more commonly used symbols with shorter representations and uses longer representations for less common symbols

PNG vs JPEG


SOMETIMES PNG IS SUPERIOR....
FOR ILLUSTRATIONS, SCREENSHOTS, ANYTHING WITH TEXT...
...WEBCOMICS, GRAPHS, LOGOS...
NOPE! ALWAYS JPEG!!!
JPEG ONLY!!! NO THINKING REQUIRED!!
I LOVE JPEG!! JPEG! JPEG!

SVG – Scalable Vector Graphic

- **Vector** image format (the others are **bitmap**)
- A language for describing 2D graphics using XML
- SVG graphics are scalable to different display resolutions and are printable
- Most browsers now support SVG

- Example: http://en.wikipedia.org/wiki/File:Flag_of_Australia.svg

Choosing the Right Format

- JPG: use JPG for all 24-bit full color photographic images, as well as more complicated graphics that contain color gradients, shadows, and feathering

- GIF: the everyday file format for all types of simple colored graphics and line art
  - GIF's transparency feature lets you seamlessly integrate graphics into your Web site
  - … but PNG is mostly preferred

Choosing the Right Format

- PNG: you can use PNG as a substitute for GIF; many screenshots, high-color (more than 256) with gradients - but not photographs
  - Only really need GIF instead of PNG when you want animation

- SVG: offers many advantages, excellent for vector images

Image Dimensions and File Size

- Pixel: smallest element of light or colour on a device displaying images
- Common resolution for laptops is 1366 x 768 pixels
- The disadvantage of an image with a high resolution is that it also has a large file size
- Use graphic or photo editors to optimise an image with a large file size to reduce its file size and load time

Use Meaningful Image File Names

- Many digital cameras use a default file-naming convention, such as IMG001.jpg, which does not describe the image in the photo

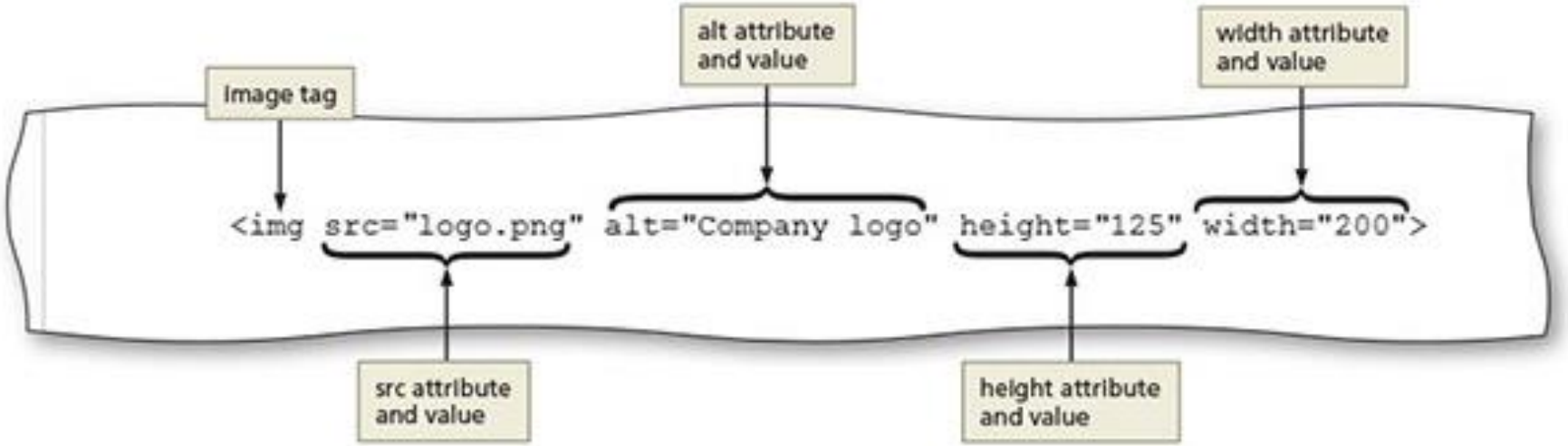
HTML Image Tag and its Attributes

- The image tag is an empty HTML tag used to add an image to a webpage
  - <img>
- The image tag includes several attributes
  - src
  - alt
  - height
  - width

HTML Image Tag and its Attributes

Attribute	Function
src	Identifies the file name of the image to display
alt	Specifies alternate text to display when an image is being loaded Especially useful for screen readers, which translate information on a computer screen into audio output Should briefly describe the purpose of the image in 125 characters or less
height	Defines the height of the image in pixels, which improves loading time
width	Defines the width of the image in pixels, which improves loading time

- Table 3-2 Image Element Attributes
- Figure 3-12



Exploring Div Elements

- Div element defines an area or a division in a webpage
  - Uses the and tags
  - Used to structure block-level sections of a webpage
  - Can be used within the main element to further divide the primary content area into separate sections

Div Attributes

- The div element id attribute identifies a unique area on a webpage and distinguishes it from other page divisions
- This will be “targeted” with CSS

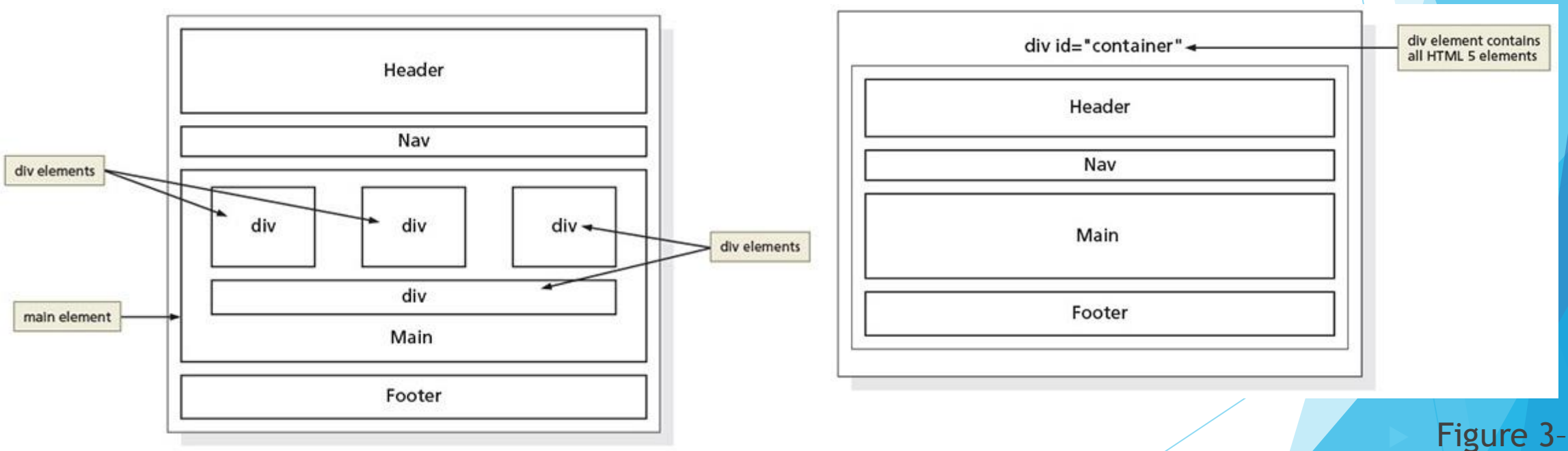
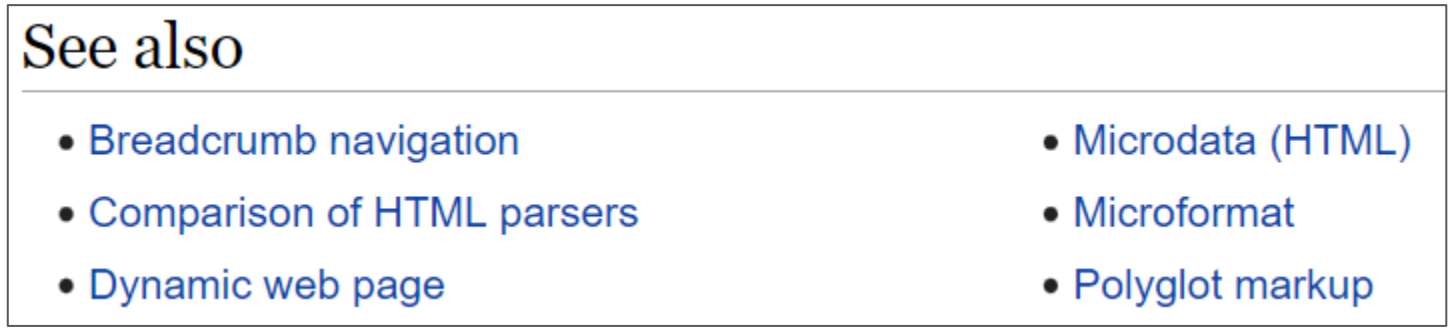


Figure 3-21, 22

Adding Links to a Webpage

- Hyperlink: link on a webpage that allows users to navigate a website and move to another location

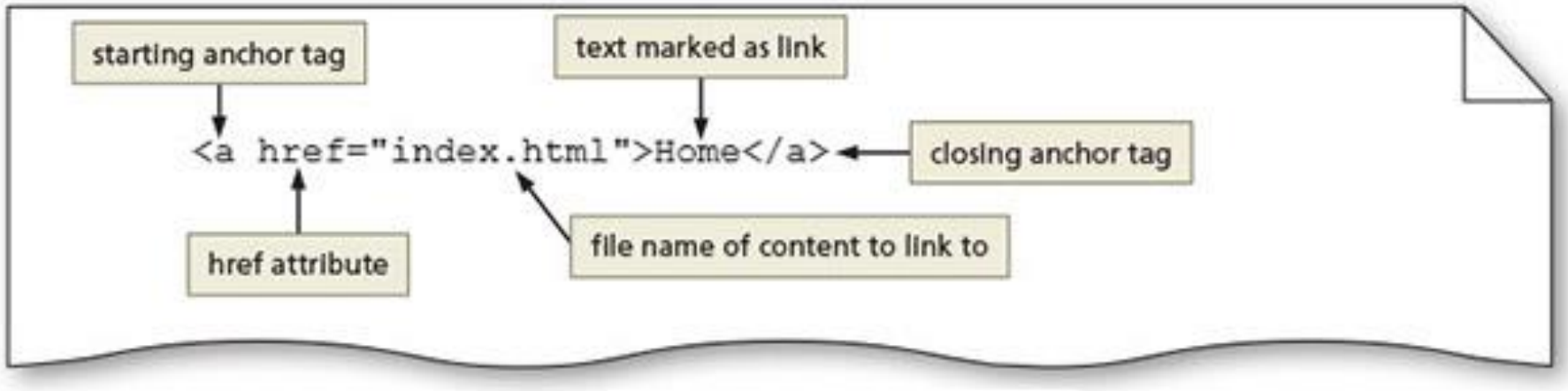


Adding Links to a Webpage

- Text link: when text is coded as a hyperlink, it appears as underlined text in a color different from the rest of the webpage text
- Image link: an image used as a link; some websites display a border around the image

Anchor Element

- Used to create a hyperlink on a webpage
- The <a> and are the start and the end tags
- Include the href attribute to identify the destination webpage, email address, file, telephone number, or other content



Relative Links

- Hyperlink that links to other webpages within the same website
- Created using an anchor element with an href attribute that designates a path to the webpage/destination
- Does not start with http:// (or similar protocol)

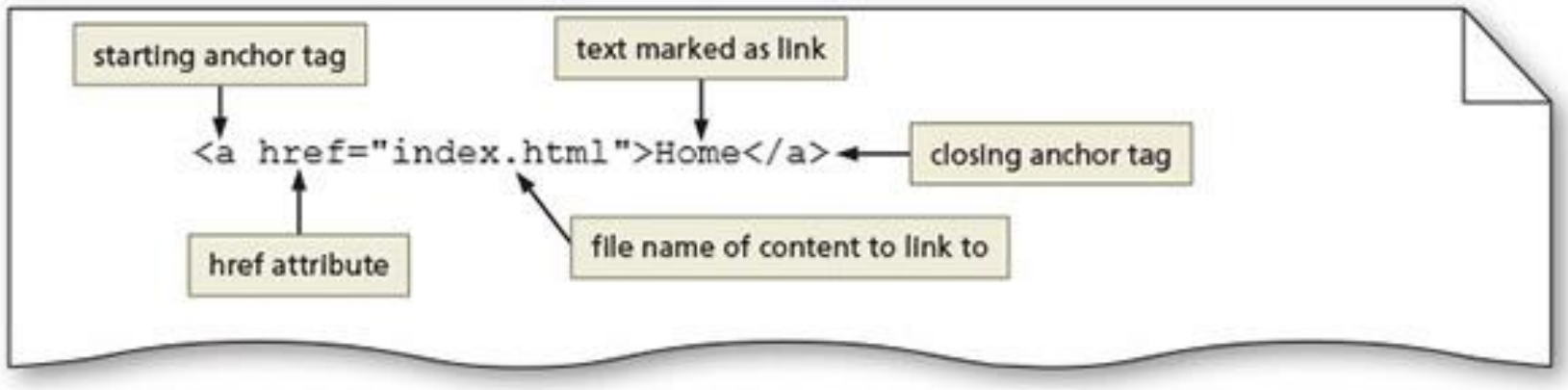


Figure 3-30

Absolute Links

- Hyperlink that links to other webpages outside of a website
- Created using an anchor element with an href attribute that designates a website URL
- Does start with http:// (or similar protocol)

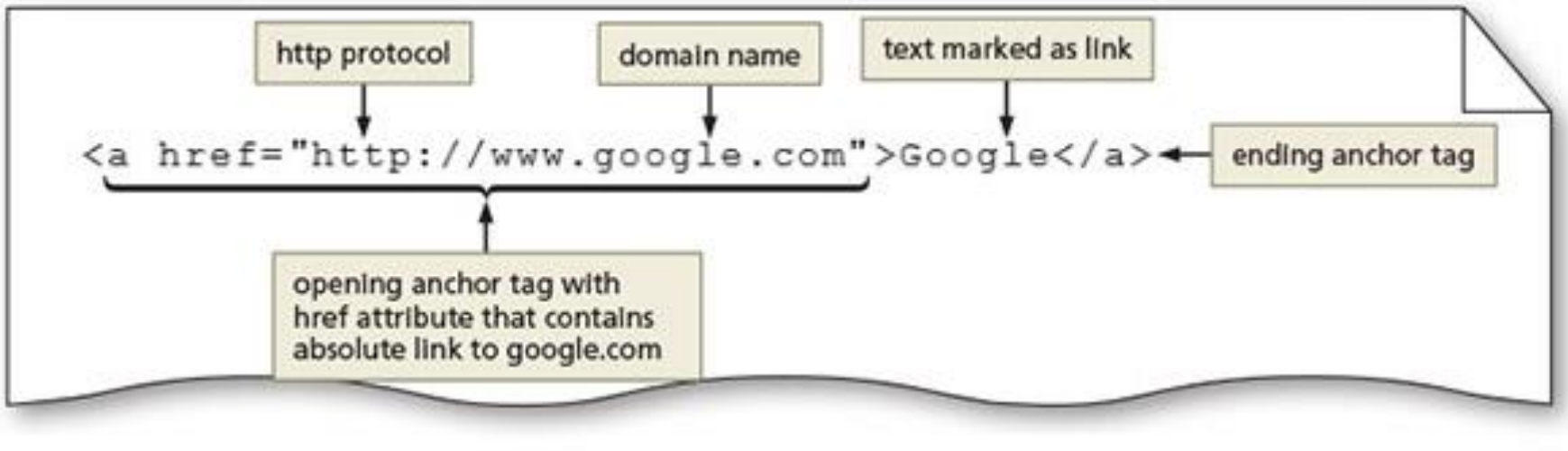


Figure 3-31

Bookmarks

- Some webpages contain a lot of content, making them quite long
  - Requires excessive scrolling to see all the page content
- Bookmarks let website visitors jump to specific areas on the page
  - To create a bookmark, insert an id attribute and value in the element where you want to include a bookmark
  -

    The following code creates a link to the bookmark (note the #):
    <a href="#lesson1">

Image Links

- Images can be used to link to another page within the site, another website, an email address, or a telephone number

Figure 3-32

Email Links

- Hyperlink that links to an email address
- Use anchor elements to link to an email address by including the href attribute followed by "mailto:" and then the email address

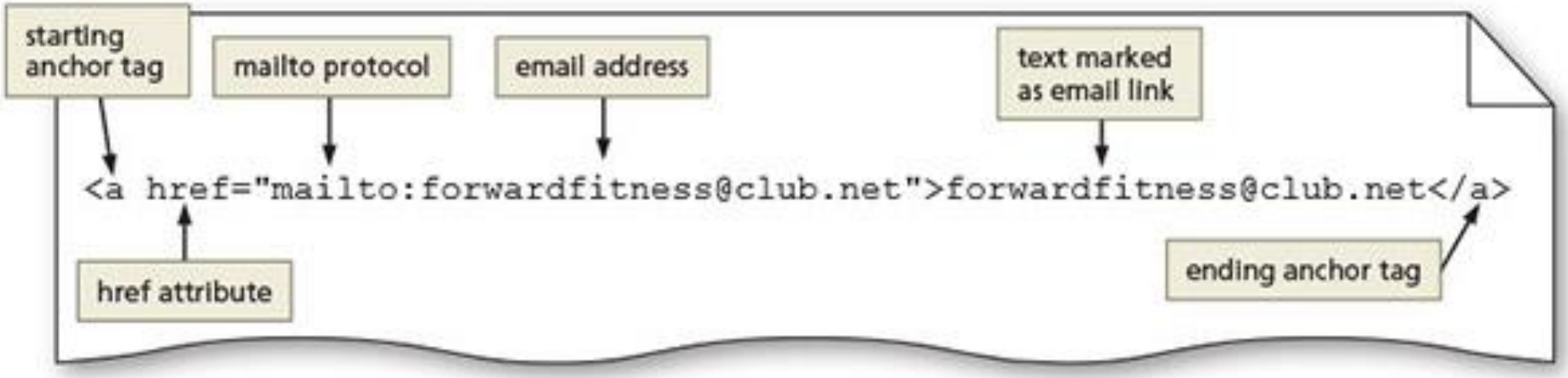


Figure 3-33

Telephone Links

- Hyperlink that links to a telephone number
- Use an anchor element to link to a telephone number by including the href attribute, followed by "tel:+1number" where +1 is the international dialing prefix and number is the phone number

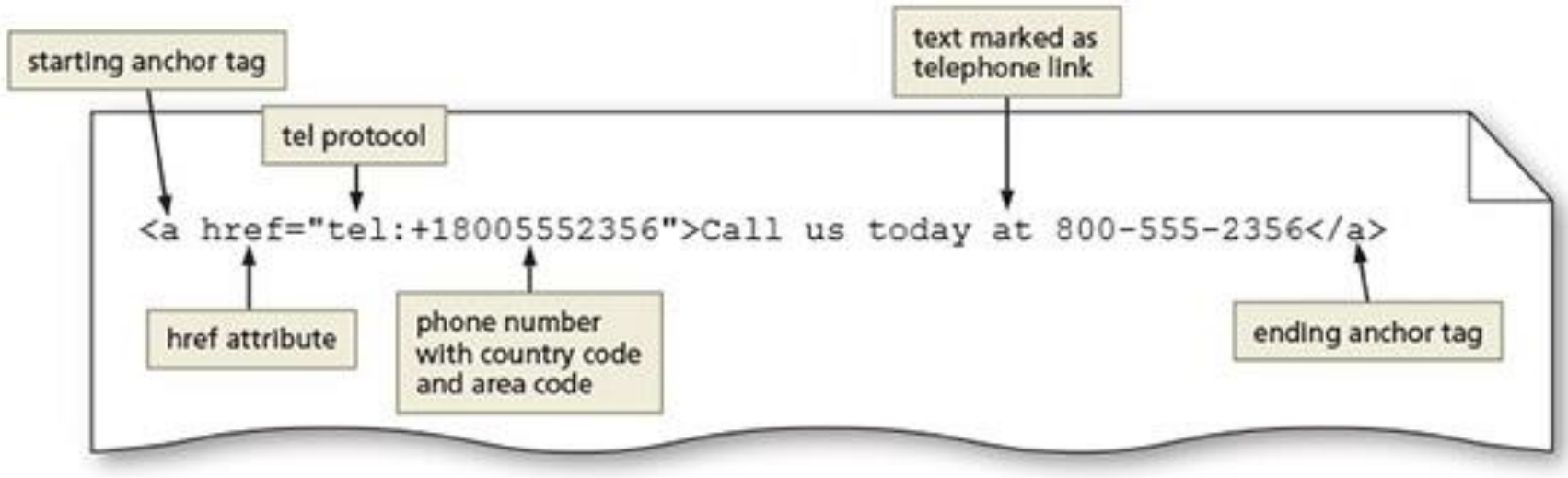


Figure 3-35

Adding Lists

- Lists structure text into an itemised format
  - **Unordered** lists display bulleted items in any sequence
  - The <ul> and are the start and end tags for an unordered list
  - and are the start and end list item tags

- The following code creates a bulleted list of two items:

```
<ul>
    <li>First item</li>
    <li>Second item</li>
</ul>
```

Adding Lists

- Ordered lists display information in a series using numbers or letters
  - The <ol> and are the start and end tags for an ordered list
  - and are the start and end list item tags
- The following code creates a numbered list of two items:

```
<ol>
    <li>First item</li>
    <li>Second item</li>
</ol>
```

Adding Lists

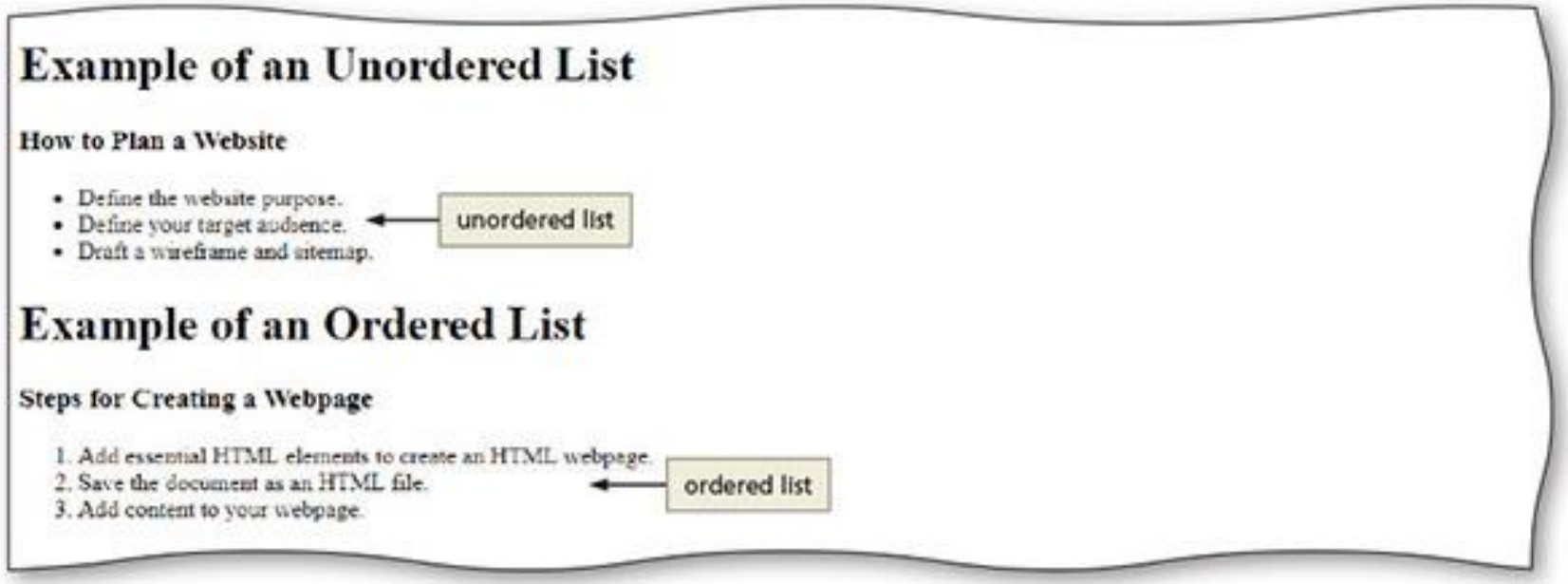


Figure 3-51

Adding Lists

- A description list contains terms and descriptions
- The <dl> and </dl> are the start and end tags for a description list
- Each term is marked within a pair of <dt> and </dt> tags
- Each description or definition is marked between a pair of <dd> and </dd> tags

Adding Lists

- The following code creates a description list of two terms and definitions:

```
<dl>
    <dt>First term</dt>
    <dd>First definition</dd>

    <dt>Second term</dt>
    <dd>Second definition – part 1</dd>
    <dd>Second definition – part 2</dd>
</dl>
```

Adding Lists

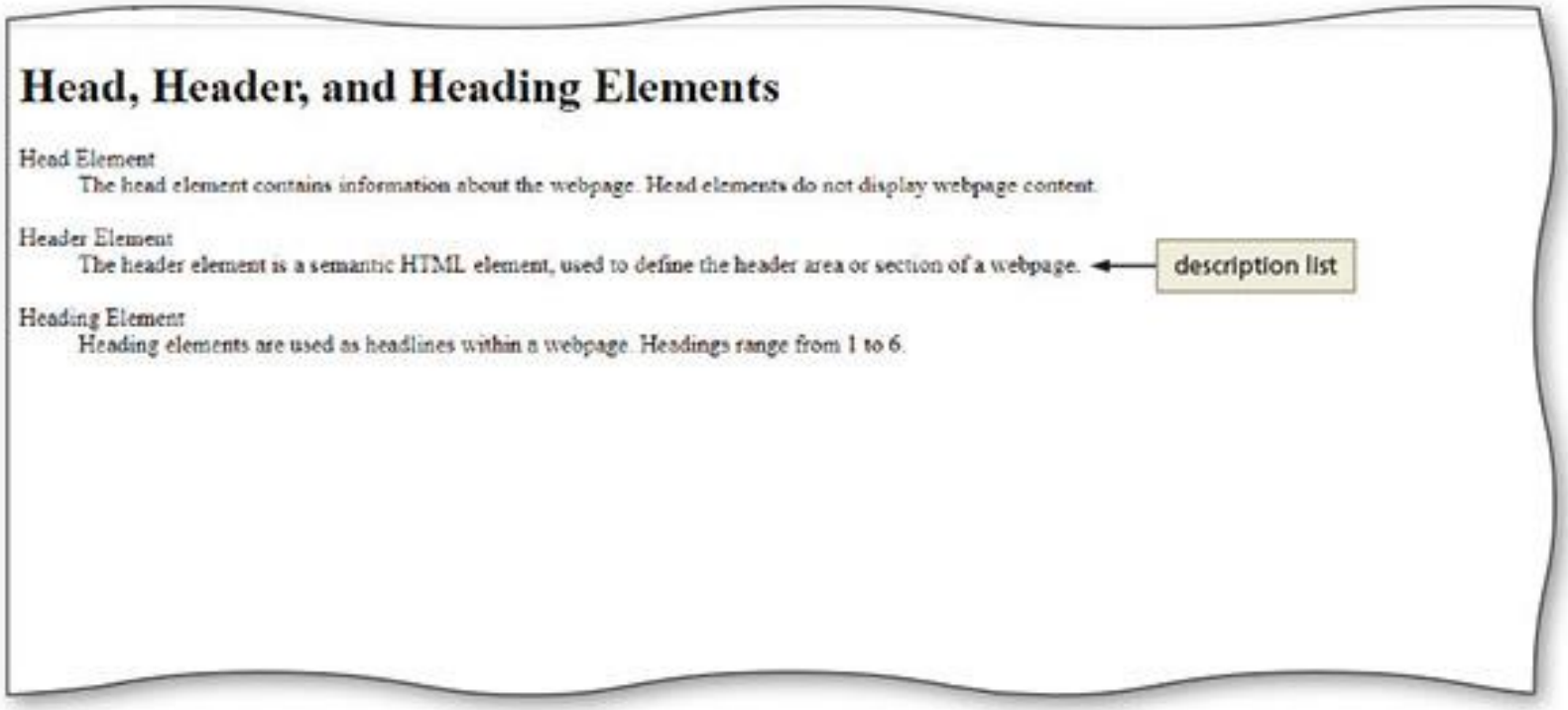
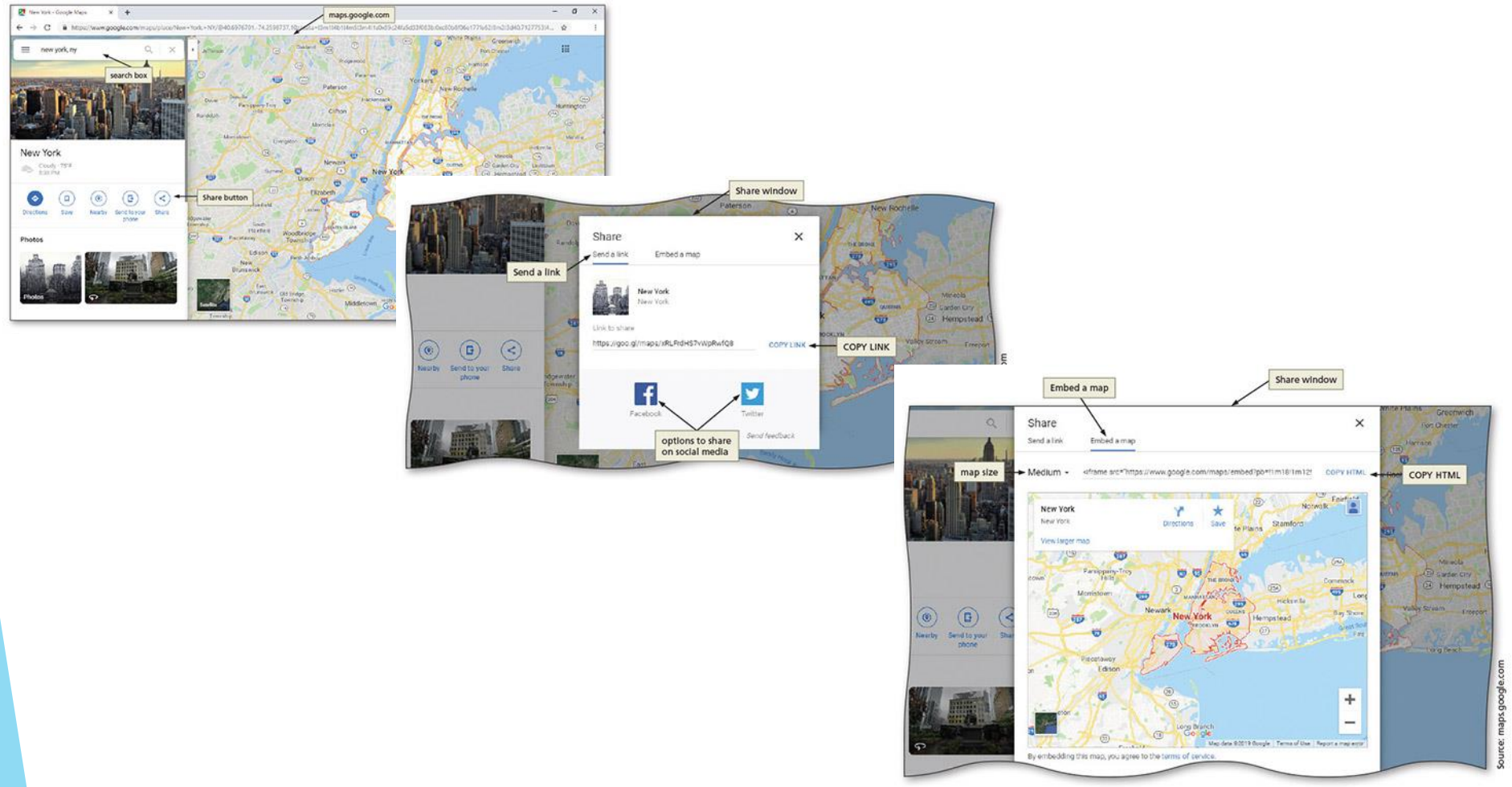


Figure 3-52

Embedding a Map

- Many businesses include a location map embedded within their website
  - Gives visitors a clear view of the business location
- Websites such as maps.google.com and mapquest.com provide online maps
  - Web developers can visit an online map, enter an address, and then obtain the required code to embed the online map directly within a webpage
  - https://google-map-generator.com/

Embedding a Map



- Figure 3-67, 68, 69

Chapter Summary

- In this chapter, you learned about:
  - Creating many types of hyperlinks
  - Inserting new HTML elements, including div elements, image elements, headings, and lists