SVG in HTML

For Icons, Maps, Graphs, Charts, etc.

A History of Markup Languages

- GML
  - Generalized Markup Language
  - Defined in 1960s at **IBM**
  - Syntax uses colons... :h1 id='intr'.Introduction
- SGML
  - Standardized Generalized Markup Language
  - Defined in 1986 at **ISO**
  - Syntax uses angle-brackets... <h1 id="intr">Introduction</h1>
- HTML 1.0 - 4.0
  - Uses SGML syntax but not "generalized" anymore -- comes with a specific set of tags
  - Created as a side project in 1991 by Tim Berners Lee who worked at CERN at this time
- XML
  - "eXtensible Markup Language"
  - A general replacement for SGML to avoid its perceived lax and overly-forgiving nature
  - Defined in 1996 by **W3C**

Battle for HTML: SGML or XML?

- XHTML
  - A **failed** attempt to migrate HTML from SGML syntax to XML syntax
  - Any syntax errors would break the entire page
  - Defined in 2000 by the **W3C**
  - Almost never used today (see below)
- HTML5
  - A **successful** attempt to migrate off of both SGML and XML
  - Slight revision that made HTML its own language
  - Kept the forgiving nature of SGML but standardized error handling across browsers
  - Defined in 2008 by **WHATWG** (the Web browser vendors)
  - Authors can embed only certain kinds of XML in HTML5

XML-Based Languages

- RSS
  - Really Simple Syndication
  - Used in Feed Reader software
- DOCX
  - Microsoft's document format
  - Used in Microsoft Word
  - Updated from .doc (binary format)
- XSLT
  - Transform an XML document to a different type of XML document
- XML-FO
  - "Formatting Objects" for generating PDF from XML
- SOAP
  - Messaging protocol for communication between client and server
  - Superceded by JSON over HTTP according to REST principles

Two XML languages were integrated into HTML5

- SVG
  - 2D vector graphics format
  - Used for icons, maps, graphs, anything that's not a picture or 3D model
  - The <svg> element in HTML
- MathML
  - Mathematical expression format
  - Used in some e-textbooks
  - The <math> element in HTML

Two Types of Images

- Raster vs Vector
  - PNG/JPG/etc vs SVG/PDF/etc
- **Raster** is a large grid of tiny cells where each cell is populated by a color.
  - If you make the grid bigger, then each cell gets bigger and more noticable.
  - This results in **pixelation**
- **Vector** uses **lines** and mathematical **curves**, instead of pixels
  - Can be stretched (scaled) infinitely without pixelation
- When zooming the browser window...
  - Raster images get pixelated, so the browser will step in and attempt to reduce pixelation using various algorithms
  - SVG graphics never appear pixelated, always appear crisp and sharp without help from the browser

Uses for SVG

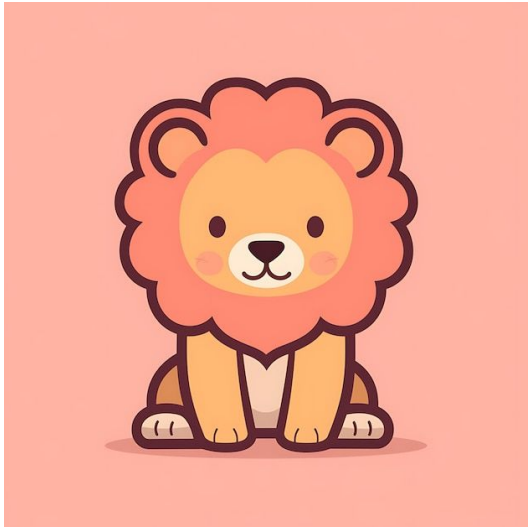
- Icons
- Icon Sets
- Logos
- Simple cartoons and other flat-color imagery
- Graphs
- Charts
- Maps

SVG Basics

- <svg> container
- <line />
- <circle />
- <rect />
- <polygon />
- <path d />
  - d = path commands
- <text>
  - Also <textPath>
- <g> for grouping
  - Useful for accessible purposes
- <symbol /> + <use />
  - Display the same SVG multiple times

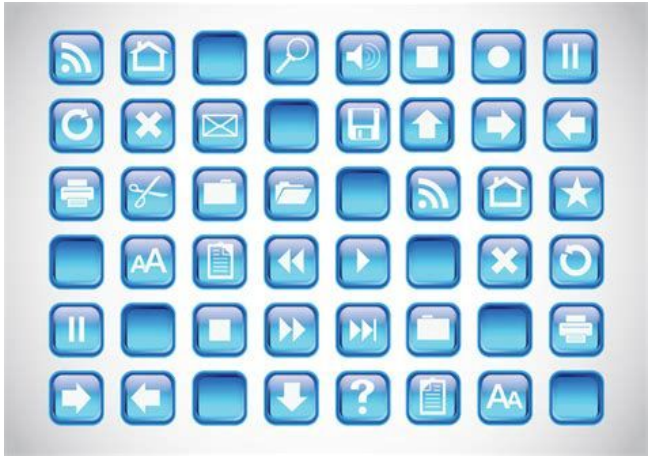
Accessible SVG Cartoons

- Cartoons and flat graphics
  - role="img" + aria-label
  - Consistent with <img />



Accessible SVG Icons

- Icons in <button />s
  - Label the button another way, ignore the SVG
  - .visually-hidden text + aria-hidden="true"



Accessible SVG Graphs

- The screen reader alternative should almost always be a <table>
  - Lists (<ol>/<ul>) may make sense
- You can either...
  - Embed a .visually-hidden <table> and hide the SVG
  - Add table ARIA roles to SVG elements
    - <g> is equivalent to
- Demo
  - https://demos.tink.uk/svg-line-graph/