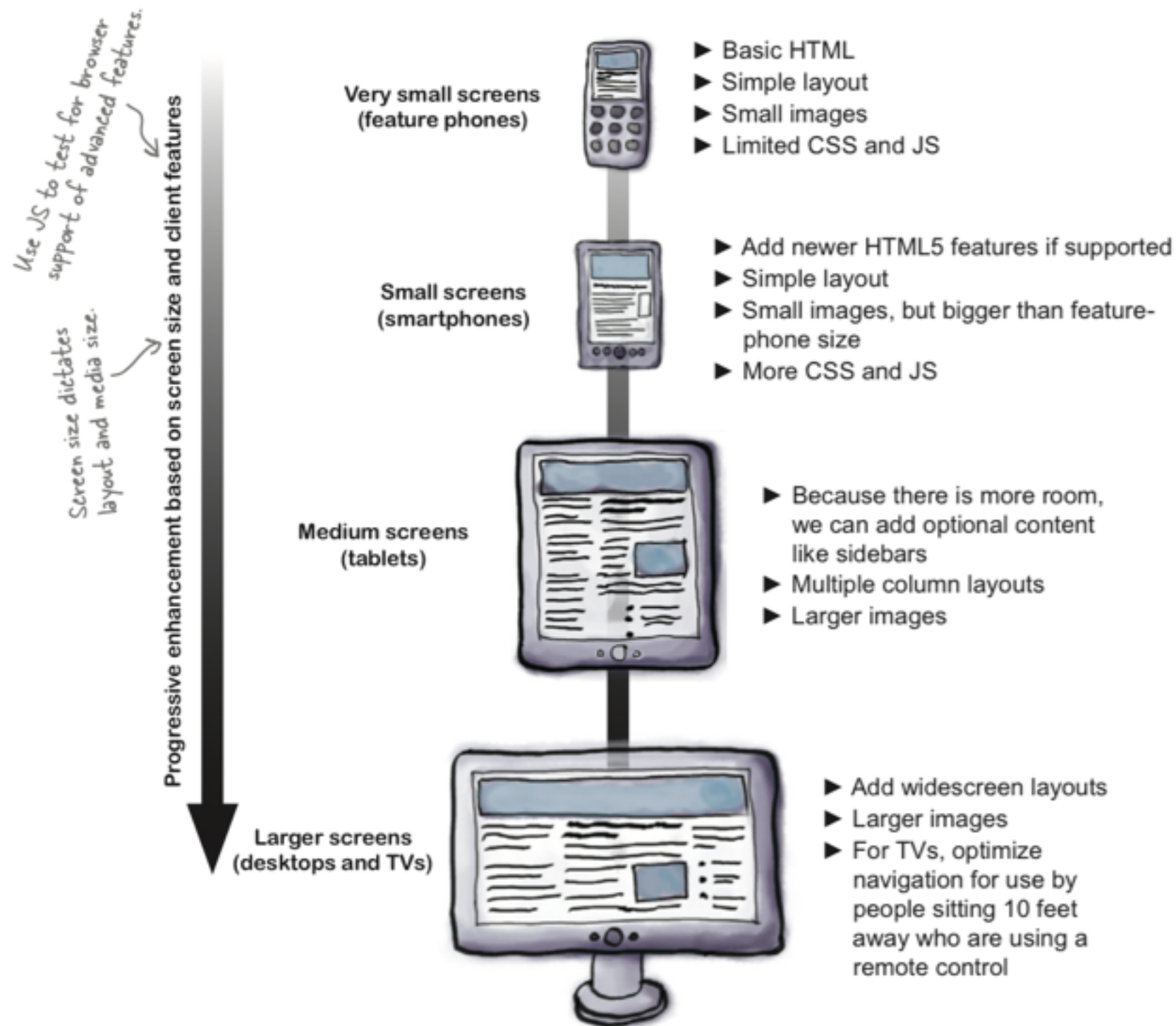


# Basic principles of responsive web design

- Mobile-first
- Progressive enhancement
- Fluid layouts
- Media Queries
- Images
- Typography



# Progressive Enhancement



\*These are just examples of enhancements. What you do depends on the project.

# Viewport

- Set the viewport

```
<meta name="viewport" content="width=device-width, initial-scale=1">
```

- This allows the page to reflow content to match different screen sizes
- Size content to the viewport
  - Do not use large fixed width elements.
  - Content should not rely on a particular viewport width to render well.

# Fluid Layouts

## Units of measure

- **%** - Percentage of parent container
- **em** - based on font size in *parent* element
- **rem** - based on font size of *root* element
- **vw/vh** - based on viewport size
  - vw**: hundredths of the viewport width.
  - vh**: hundredths of the viewport height.
  - vmin**: hundredths of whichever is smaller, the viewport width or height.
  - vmax**: hundredths of whichever is larger, the viewport width or height.

<http://viewportsizes.com/mine/>

# Media Queries

[https://developer.mozilla.org/en-US/docs/Web/Guide/CSS/Media\\_queries](https://developer.mozilla.org/en-US/docs/Web/Guide/CSS/Media_queries)

- CSS3 **media queries** let us apply CSS selectively to different user environments based on the current value of relevant media features.
- **Media types** (e.g., screen, print, projection) have **media features** (width, color, monochrome, orientation). It's these media features we evaluate in our media queries.
- A **CSS media query is a logical expression**. When it evaluates to TRUE, the enclosed CSS rules are applied.
- There are lots of media features: screen size, screen density, orientation and many others.

[http://pieroxy.net/blog/2012/10/18/media\\_features\\_of\\_the\\_most\\_common\\_devices.html](http://pieroxy.net/blog/2012/10/18/media_features_of_the_most_common_devices.html)

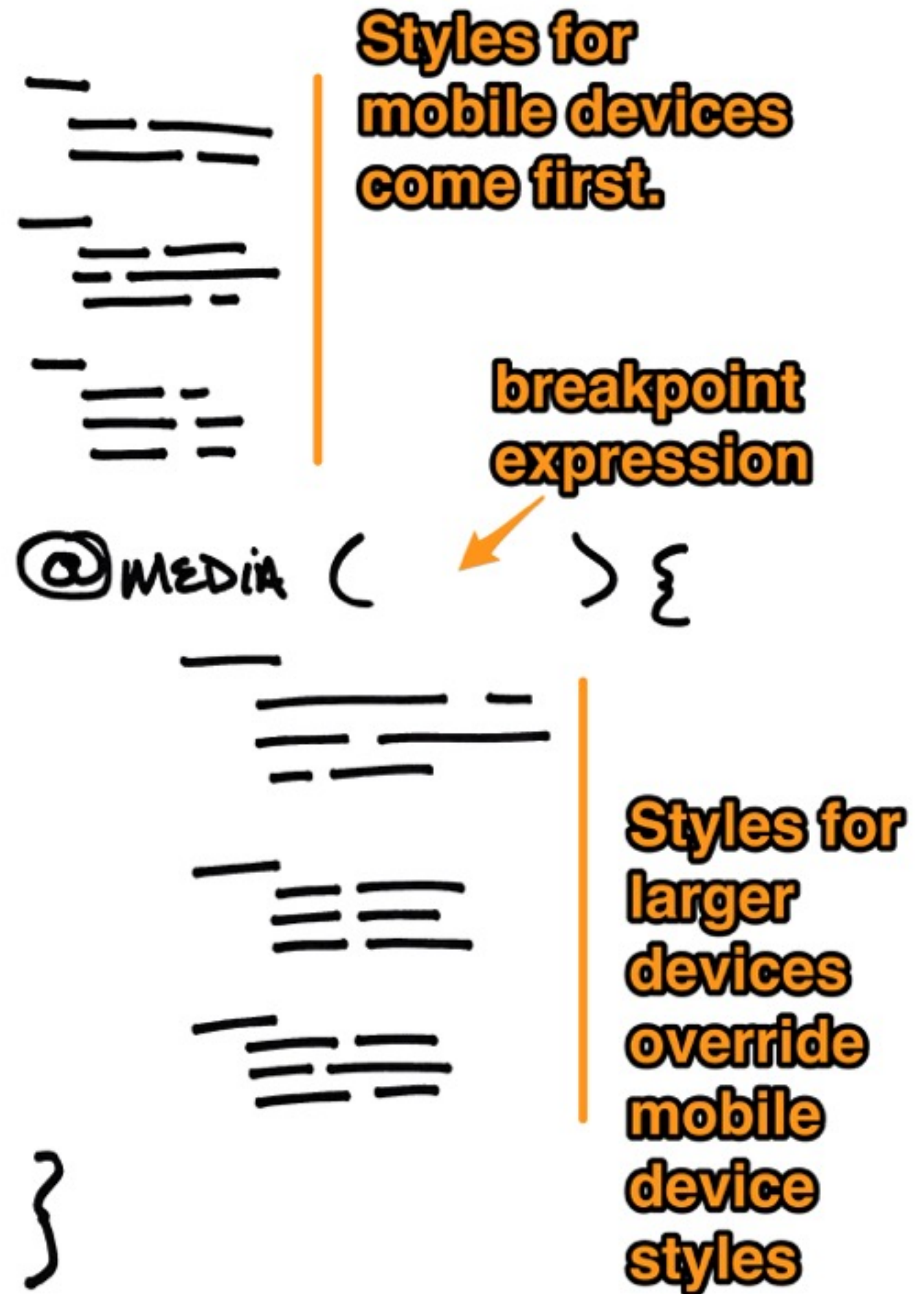
# Syntax

```
1 <!-- CSS media query on a link element -->
2 <link rel="stylesheet" media="(max-width: 800px)" href="example.css" />
3
4 <!-- CSS media query within a stylesheet -->
5 <style>
6 @media (max-width: 600px) {
7     .facet_sidebar {
8         display: none;
9     }
10 }
11 </style>
```

[https://developer.mozilla.org/en-US/docs/Web/Guide/CSS/Media\\_queries](https://developer.mozilla.org/en-US/docs/Web/Guide/CSS/Media_queries)

# Mobile-first:

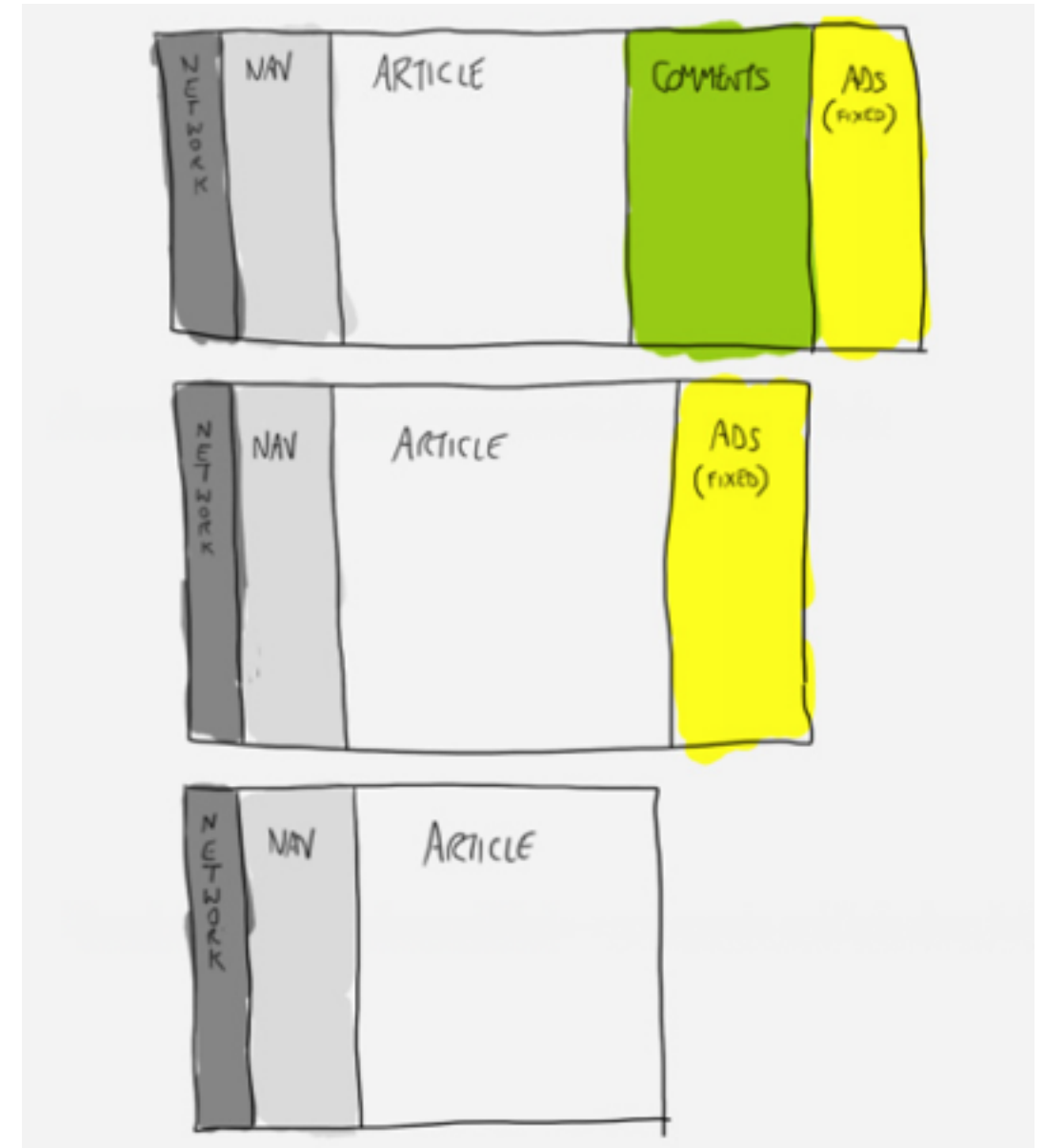
- Design mobile styles first.
- Add media query for larger devices.
- Override styles as needed.





# Breakpoints

- Create breakpoints based on content, never on specific devices, products or brands.
- Design for the smallest mobile device first, then progressively enhance the experience as more screen real estate becomes available.
- Keep lines of text to a maximum of around 70 or 80 characters.



<https://developers.google.com/web/fundamentals/layouts/rwd-fundamentals/how-to-choose-breakpoints>  
<http://www.smashingmagazine.com/2013/03/01/logical-breakpoints-responsive-design/>



# Responsive Images

- Choose image format based on content
- Manage images in HTML/CSS using fluid layout
- Load different image files based on device features



<https://smartaddons.s3.amazonaws.com/images/Released-Image/sj-lifemag/new/responsive.png>

# Start with the right format

- Use JPG for photographic images.
- Use SVG for vector art and solid color graphics such as logos and line art.
- Use PNG-8 rather than GIF as it allows for better transparency, more colors and offers better compression ratios.
- Use GIF for small animations but for longer animations, consider using <video> which provide better image quality and gives the user control over playback.
- Reduce file size



<https://developers.google.com/web/fundamentals/media/images/optimize-images-for-performance>  
<http://stackoverflow.com/questions/2336522/png-vs-gif-vs-jpeg-when-best-to-use>

# Manage images in HTML

Use relative sizes for images to prevent them from accidentally overflowing the container.

```
.picture {  
  content: url(elephant_1620217f.jpg);  
  width: 50%;  
}
```

<http://codepen.io/Auraelius/pen/zchlq>

# Manage images in CSS

- Set media to 100% width of parent container for fluid layout

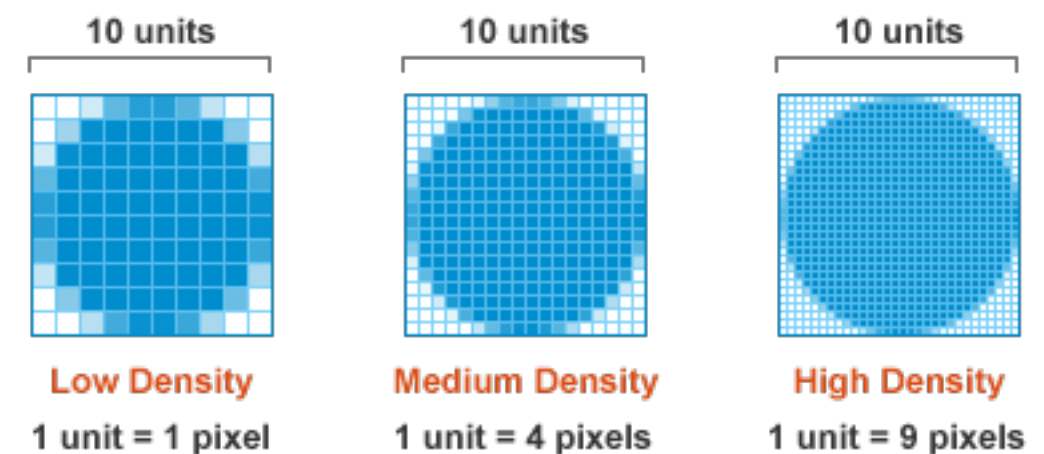
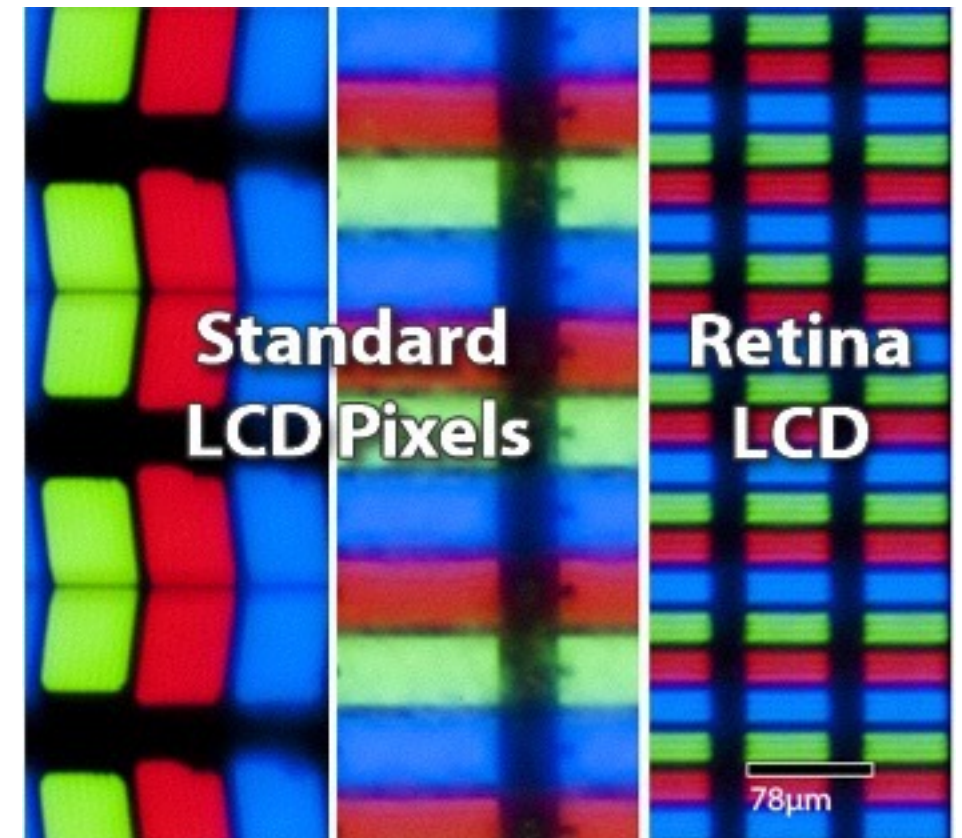
```
img, embed, object, video {  
    max-width: 100%;  
}
```

- Change the background-image property in CSS for using media queries
- Serve smaller/more compressed files to small devices

<http://codepen.io/Auraelius/pen/sClka>

# Pixel density

- Change the background-image property in CSS for high DPI displays using media queries with `min-resolution` and `-webkit-min-device-pixel-ratio`.
- Use the `picture` element when you want to specify different images depending on device characteristics.
- Use `srcset` to provide high resolution images in addition to the 1x image in markup.
- Use `srcset` and the `x` descriptor in the `img` element to give hints to the browser about the best image to use when choosing from different densities.

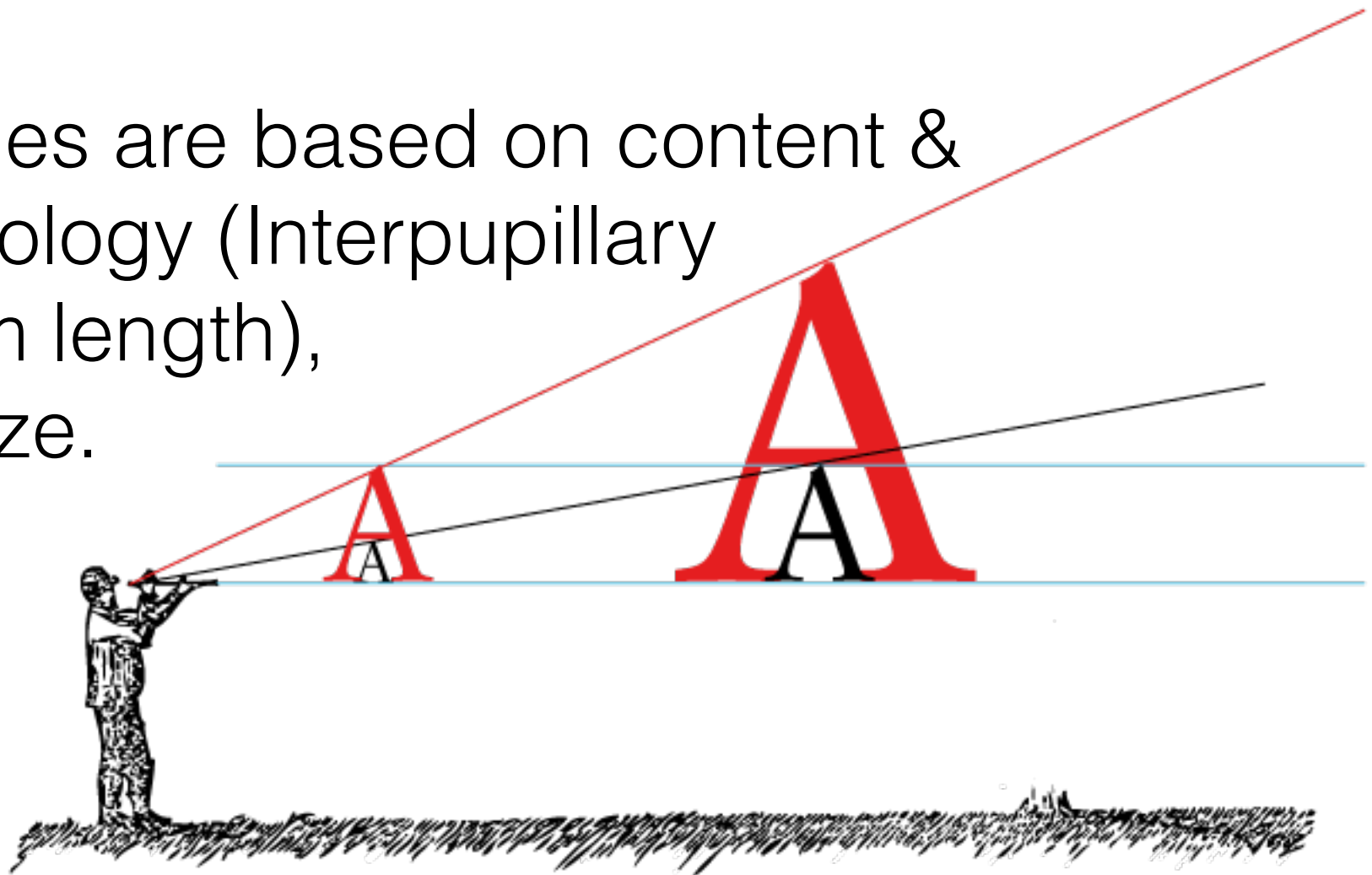


<https://developers.google.com/web/fundamentals/media/images/>  
<http://www.techspot.com/images/teaser/retina.jpg>  
<http://www.bbc.co.uk/gel/tablet/tablet-device-considerations/pixel-density>



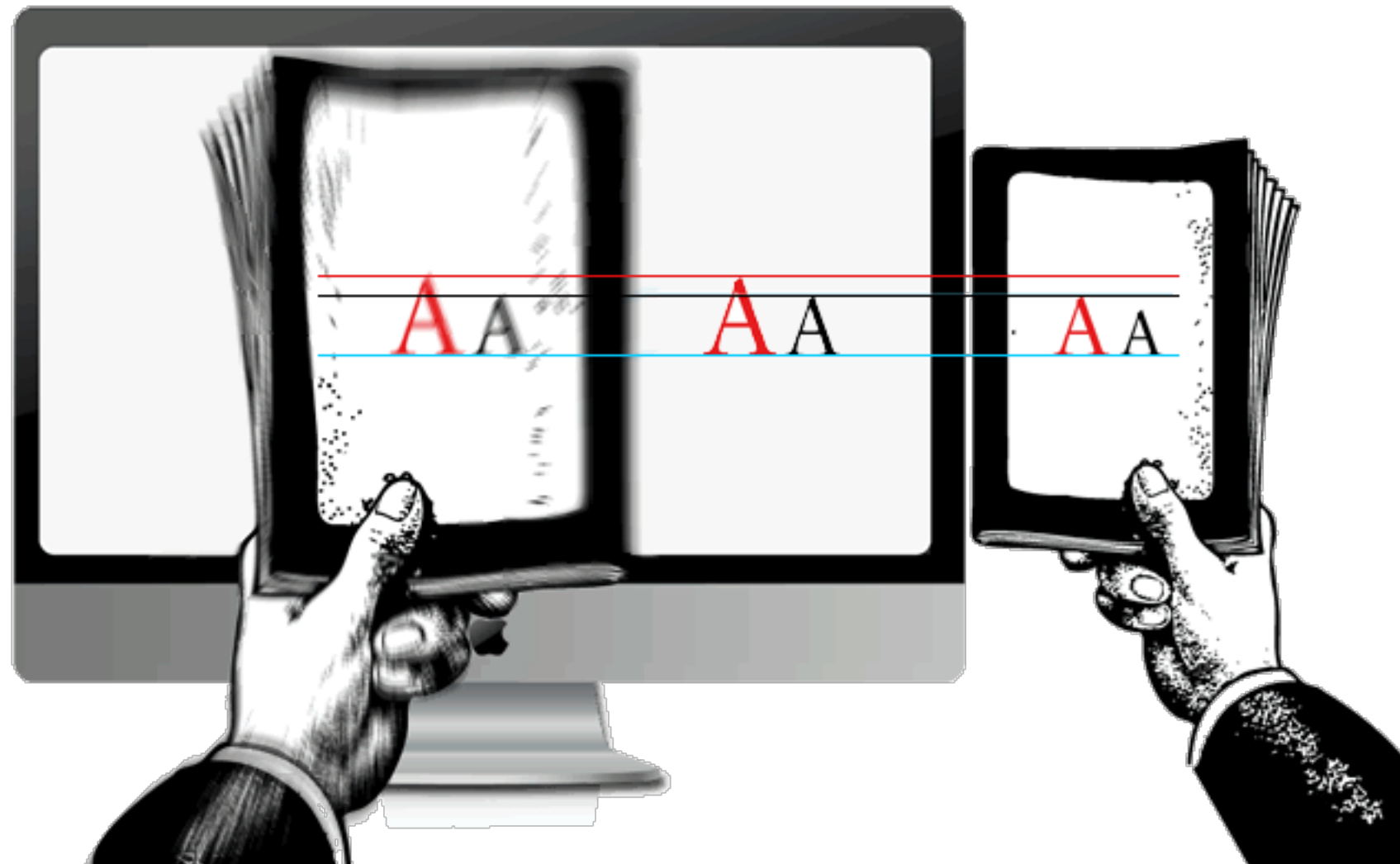
# Responsive Typography

- Text has been around for thousands of years.
- We know how to make text readable.
- Our techniques are based on content & human physiology (Interpupillary distance, arm length), not device size.



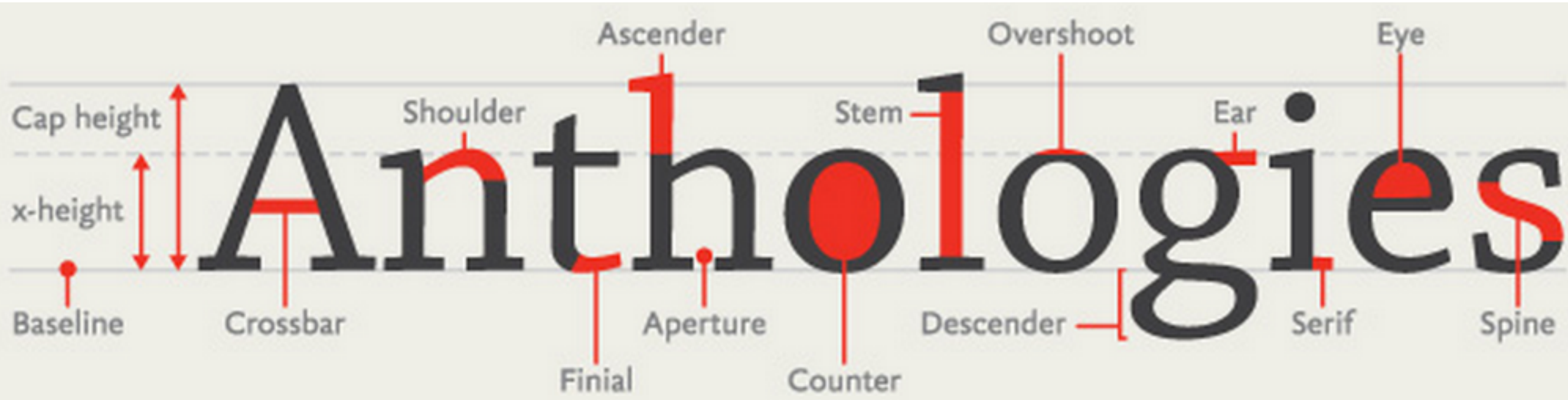
# Key Aspects

- Typeface
- Column width
- Line height





# Typeface



- Word shape
- Contrast



*On Web Typography,  
Jason Santa Maria,  
A Book Apart*

# Font face

- System fonts - always available
- Common fonts - frequently present
- Custom (downloadable) fonts - best typography but adds download time

```
<style type="text/css" media="screen, print">
  @font-face {
    font-family: "Bitstream Vera Serif Bold";
    src: url("https://mdn.mozillademos.org/files/2468/VeraSeBd.ttf");
  }

  body { font-family: "Bitstream Vera Serif Bold", serif }
</style>
```

# Readability

- Line length = 40 to 70 characters per line
  - set column width in rem units
- Leading - depends on content, font and line length but typically 150% of font height
  - set line-height property in rem units

<http://www.vanseodesign.com/web-design/legible-readable-typography/>

Caslon 10/12;  
column 10 pica;  
characters 25-30;  
**too narrow**

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Caslon 10/12;  
column 15 pica;  
characters 38-45;  
**optimal width**

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Caslon 10/12;  
column 25 pica;  
characters 70-80;  
**too wide**

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**Good**

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**Bad**

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# Root Em Units

- em - equal to the size of the font that applies to the *parent* of the element in question.
- rem - always equal to the font-size of the HTML root element
- Much easier to use
- Not available in IE8 (<http://caniuse.com/#feat=rem>)
- Example: <http://codepen.io/Auraelius/pen/yyjQJZ>