ScreenType

Typography for the screen.

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Lets Get Started ➔

Table of Contents

Everything you need to know about screen fonts.

Legend

How to use this book.

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Interaction

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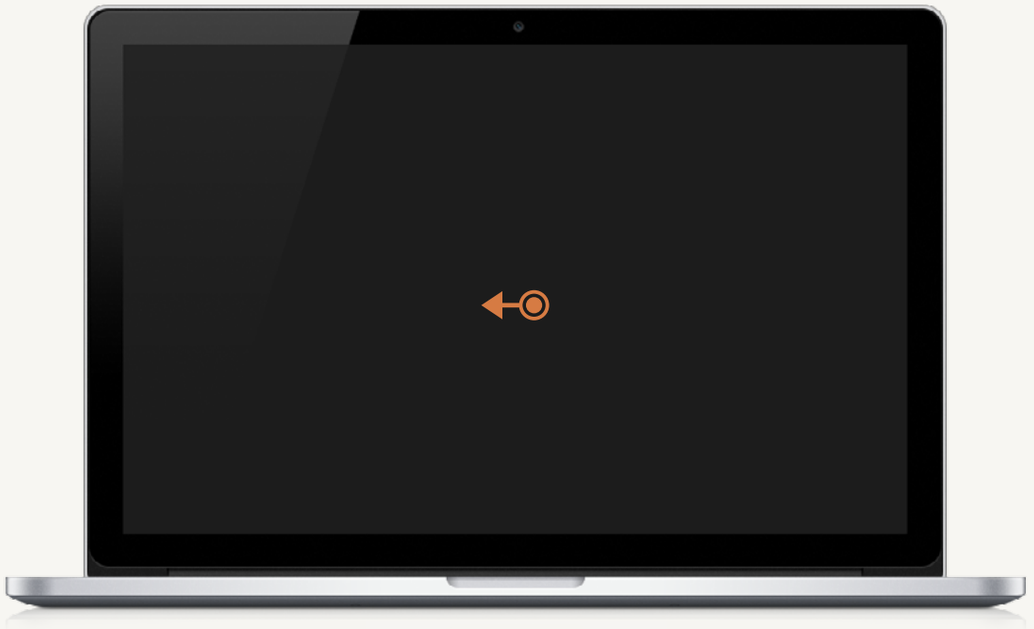

Interactive Elements

Swipe over screens to turn them on.

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Tap Me!	Button

With every font now available online, understanding how typography translates to the screen is becoming an increasingly valuable skill-set.

Introduction

Before we get started.

At heart this book is an overview of screen typography from a typographers point of view. In other words, this will not be another “how to use type online” books. We won’t discuss the well known principles of web design like using short headings, how to code, or why you should use rems. Rather this book will talk about the letters and fonts themselves.

As you will come to learn in the following pages, on-screen typography has exploded over the past year. Resources however are difficult to find and there are few if any up-to-date standards. We will dive head first into the medium, the screen. By understanding its limitations, we can illustrate the problems screen fonts solve and why many print fonts don’t perform well on-screen. We will examine fonts that do perform well and in doing so illustrate how to select and identify them in the sea of fonts we all drowned in this year.

BUCKLE UP!

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The Screen

History of Screen Fonts

From <font> to @font-face.

When HTML was released in 1990, fonts were controlled by the browser. There was no way to control web type until Netscape (remember that one?) introduced the <font> tag in 1995 that quickly became standardized into HTML2.

With it, designers could specify a font, but there was a catch, that font had to be on the user's computer system, if the user didn't have that font installed, the design would fall-back to the browser's default and often monospace font. This limitation carried over to Cascading Style Sheets (CSS), in 1996.

In 1998, CSS2 further simplified types process by separating content from style, but still relied on installed system fonts. A list of "*web-safe*" fonts, fonts likely to be present on most computer systems, was defined and CSS2 gave designers the ability to define a font stack, a string of defined fallback fonts. This allowed designers to define a font style, serif, sans-serif, monospace, or cursive and stack the closest matches to their intended font choice.

With the web growing overnight and designers choosing their own fonts, Microsoft started the *Core Fonts for the Web Initiative*. They released a series of freely distributable screen friendly fonts. In that list was Georgia and Verdana, which both became staple screen fonts and models for every web font to follow.

Hidden inside CSS2 was a hint at the future. Web designers have a complicated relationship with Internet Explorer (IE), for many it is a thorn in our designs side. To ease that pain, we have IE to thank for modern web typography. In 1997 IE 4.0 added support for downloading remote fonts. This ability was introduced into CSS2 as the font-face rule.

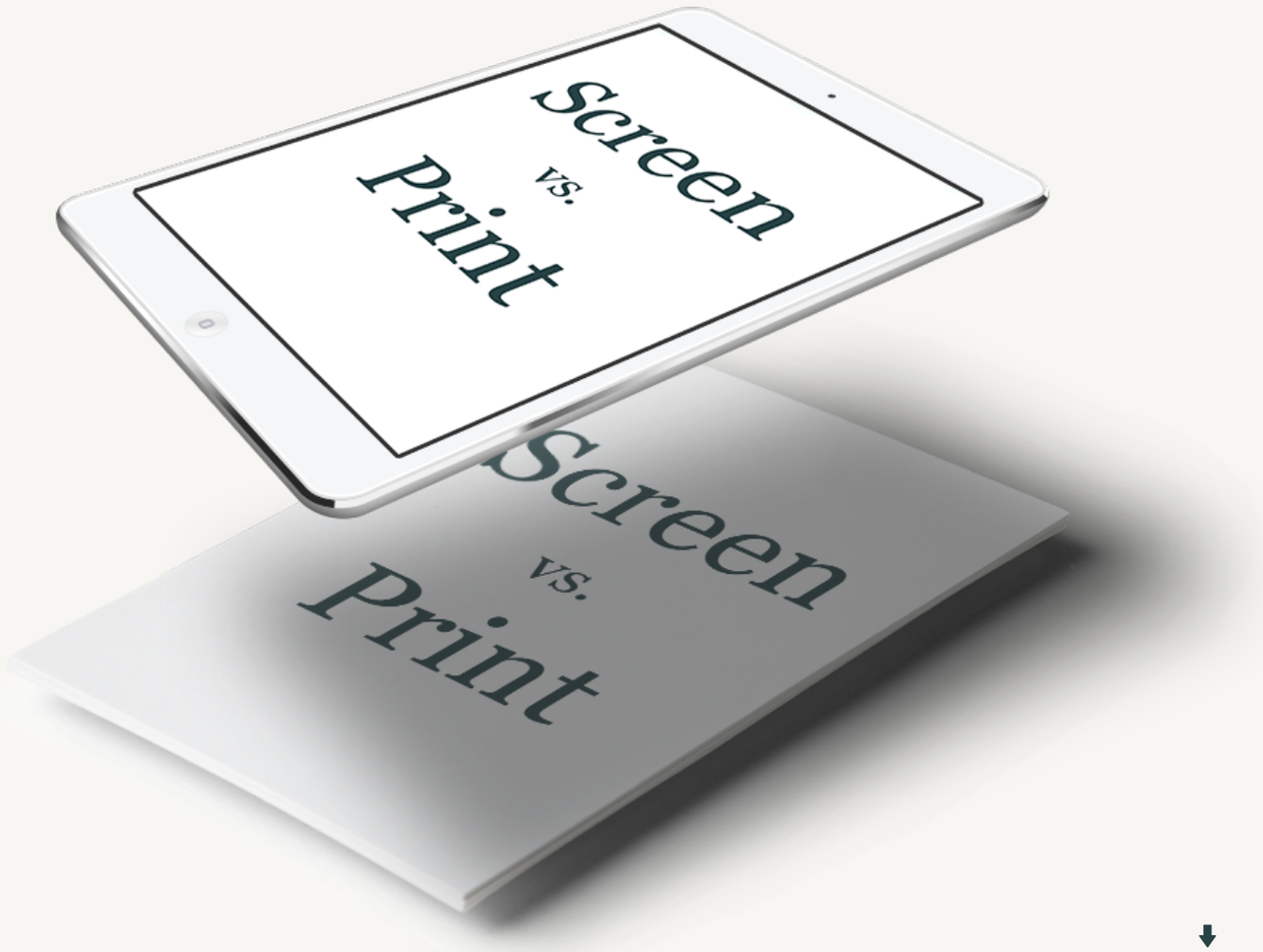
However, type foundries sided against the font-face rule. The delivery method made their fonts available to be downloaded and used by anyone. Font-face in CSS2 was used for grayscale anti-aliasing. It worked well for system fonts that were optimized for screen, like Georgia and Verdana, but other screen fonts did not exist at the time and print fonts made the web look even worse. IE's font-face rule was short lived and ahead of its time and by the time CSS2.1 was released in 1999, font downloading was abandoned. Font-face would not see again for twelve years when CSS3 was released in 2011 as the @font-face rule.

Screen Technology

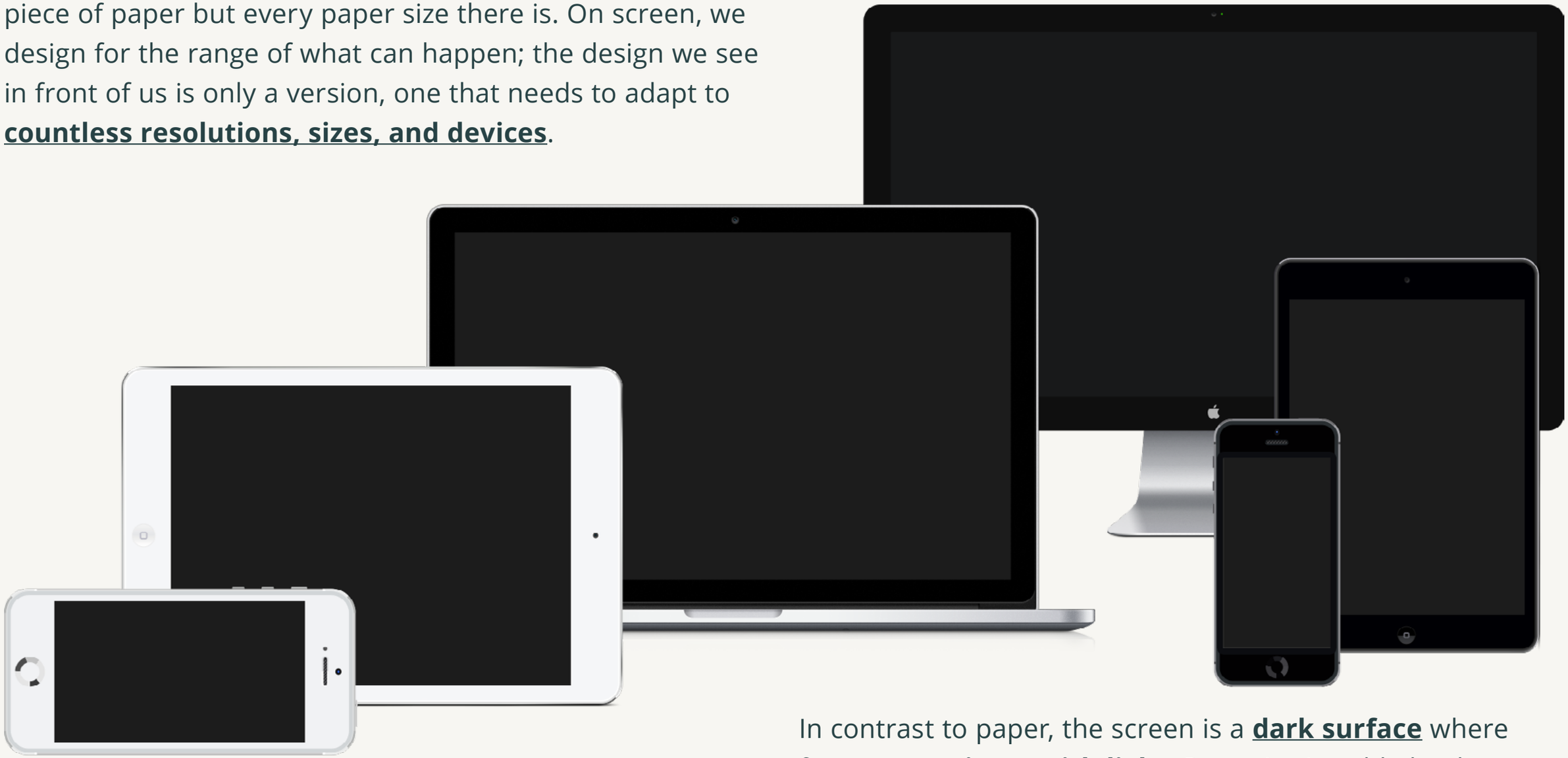
The medium.

Our understanding of how typography works in print does not translate directly to digital space. The ‘web page’ rode in on the metaphor of the printed page, and our tendency is to think of it that way. The truth is, there are very significant differences that directly affect type on screen. The foremost is that print is physical while the web is a digital medium; the difference is tangible.

In print we carefully and accurately set static content whereas on screen, that content is dynamic, it is always changing. On top of that, content is presented at variable resolutions on screen. Print can have up to 2400 dots per inch (DPI) on a laser printer making it as clear as can be. The screen's 72 pixels per inch (PPI) makes it clear your not going to get the same clarity on screen. This PPI gap has lead typographic standards on the web from day one. However, with 72 PPI monitors, 132 PPI iPads, and 326 PPI retina displays, PPI is allowing for more and more typographic details and continues to blur the line between the printed page and web page.



The screen is an adaptive medium; it is not a letter sized piece of paper but every paper size there is. On screen, we design for the range of what can happen; the design we see in front of us is only a version, one that needs to adapt to **countless resolutions, sizes, and devices**.



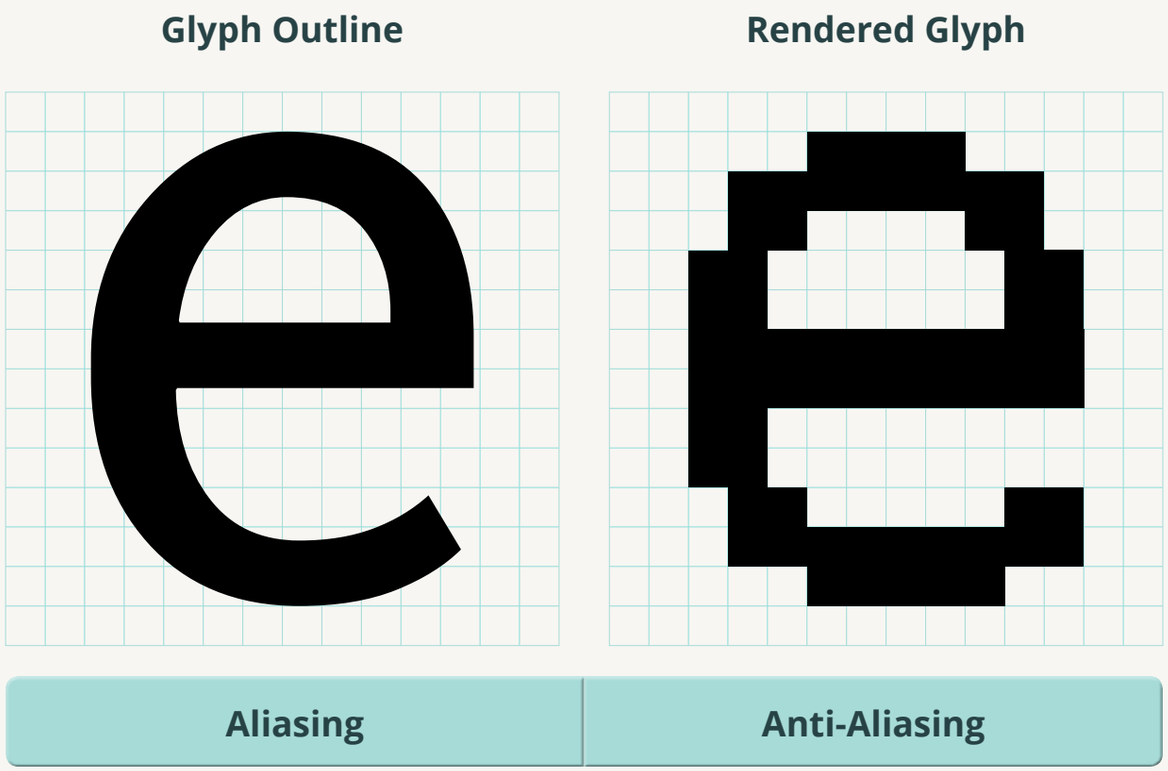
In contrast to paper, the screen is a **dark surface** where forms are **written with light**. Paper is viewable by the reflection of light whereas the screen projects images through the emission of light. This back-lite surface calls for a new way of thinking and changes in deep-rooted typographic standards.

Writing With Light

Rendering text on screen.

A big difference between type displayed on screen versus paper is the way the text is rendered. Glyph outlines get converted into pixels, the medium. That conversion process varies across operating systems, devices, and various PPI screens and often results in a lack of consistency. This conversion happens through rendering engines. Each operating system and browser controls which rendering engines are used. Therefore, even two browsers on the same system can produce different results.

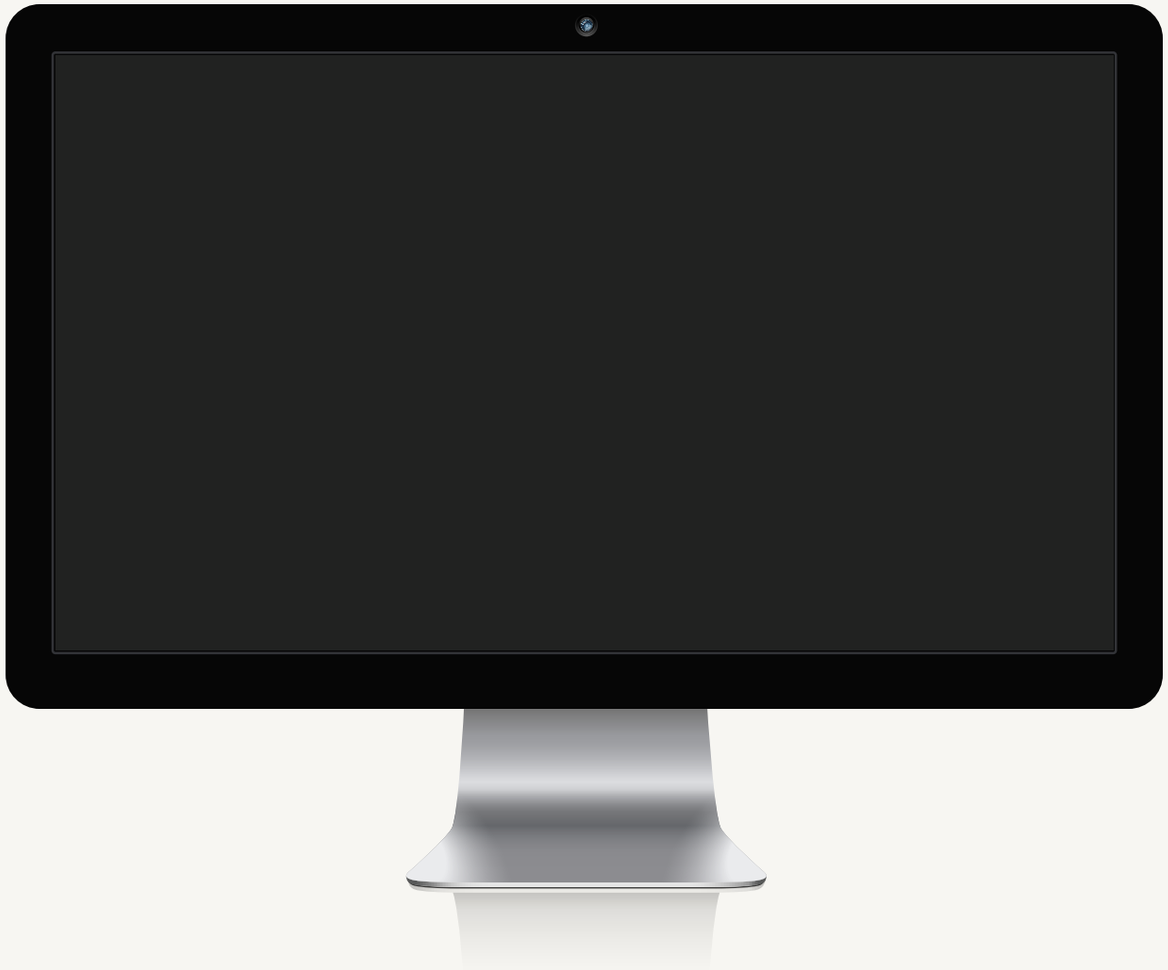
Aliasing displays diagonals and curves as horizontal zigzags and vertical lines on screen. **Anti-Aliasing** is the method systems use to reduce aliasing by shading the edges of glyphs. This is known as grayscale rendering. The edge pixels of each glyph are not black but shades of gray, this makes the contours appear smoother, and lets a typeface's details and personality shine through the pixels. This was a big step for type on screen, it was now more than just a legible glyph; a typeface could now have character.



Screens Today

We have come a long way.

Safari 3.1 re-sparked web fonts and brought the forgotten @font-face rule back into the lime light. It wasn't because of an influx of screen fonts, but big advancements in the medium, the screen. LCD displays had become the norm; we all stared in awe at high resolution flat-panels that performed anti-aliasing via subpixel rendering.

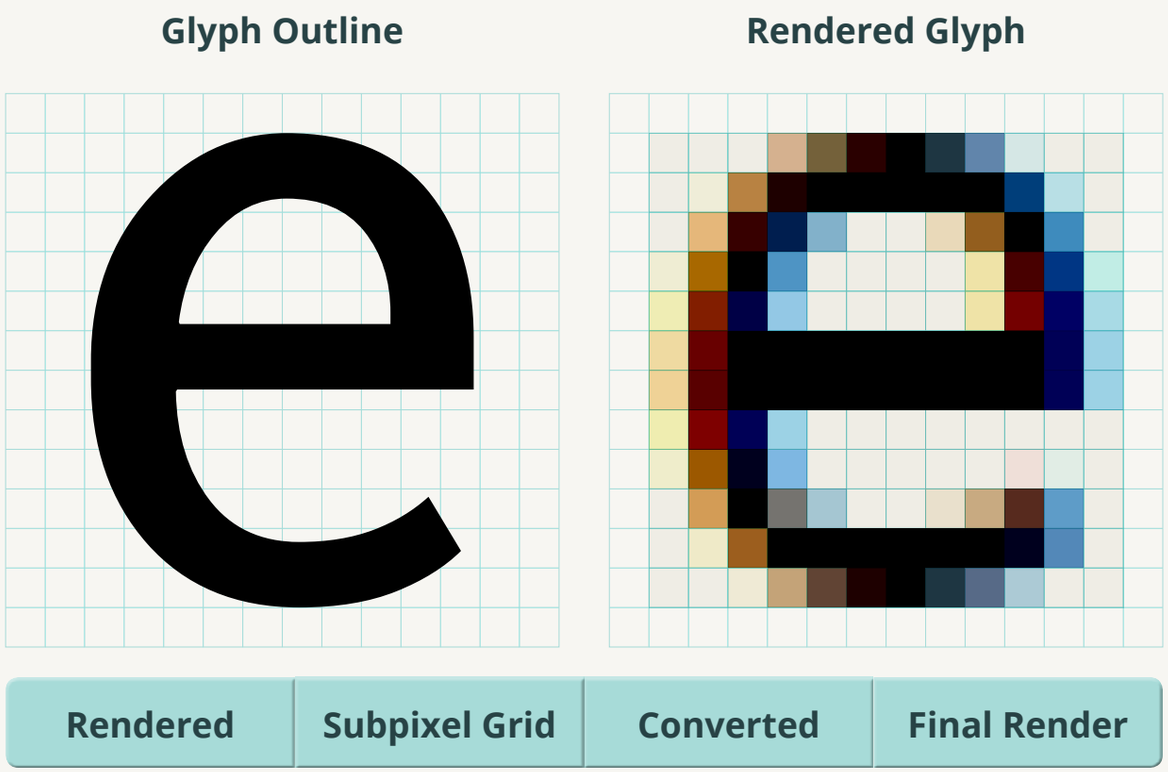


Most displays today have pixels made up of subpixels. Type is displayed by combining red, green, and blue subpixels. This is known as the **additive color system**. On paper, colors are perceived by the absorption and reflection of light off the pigments of ink on a surface. This is known as the **subtractive color system**.

In a subtractive color system like print, the contrast of black on white is very legible. However, in an additive color system, the color white is produced with each red, green, and blue subpixel at full intensity. This is why black on white is **harsh on the eyes** on screen. The light radiating from pure white can also bleed into the fine details of glyphs.

The side-by-side red, green, and blue **subpixels** control the color and brightness of a whole pixel. Because pixels are so tiny, we don't perceive them as being made up of red, green and blue bars but as a solid color. Subpixel rendering allows each pixel to carry the **visual weight** of its neighboring pixels. Subpixels produce subtle color shifts along the edges of glyphs that significantly improve the rendering of text, especially at small or text sizes. This is clearly seen if we desaturate a subpixel rendered glyph and **compare** it to a grayscale render. The horizontal resolution is tripled, resulting is a much crisper detailed character.

Due to the way type is rendered on screen, a lot depends on how letterforms are drawn, the rendering engine being used, and the amount of effort the typeface designer puts into hinting and instructing each glyph to fit within the pixel grid at key point sizes.



Playfair

ABCDEFGHIJKLMNOPQsRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890&@.,?!'“”()

Tomorrow

Surviving the growing pains of screen type.

With countless fonts and advanced rendering that allows a typeface to show its personality on screen, web designers are now able to design pages that fit their client's voice.

With every font at our fingertips, we are excited to 'set' type on-screen but are still in the growing pains of new technology. Browsers and operating systems do not yet offer consistent rendering and CSS rules such as line-height do not render equally cross-browser. The screen calls for more advanced fonts packed with information that eliminates the need for advanced typesetting. Luckily, there are already countless open source fonts available that were designed to perform on screen. There are no two fonts better to look up to than Georgia and Verdana.

Verdana

& Georgia

Verdana

A Role Model Screen Sans Serif.

When thinking of screen fonts, two faces by one designer comes to mind; Matthew Carter's traditional serif Georgia and humanistic sans-serif Verdana. Dissecting these fonts and examining their success tells us a lot about what makes a font perform well on screen.

Verdana's tall **x-height**, **open counters**, **bold bolds**, extra spacing, exaggerated features, distinct characters, and countless screen optimizations makes it a role model sans-serif for screen. Its main features are a significantly larger x-height, more generous counters, and much wider spacing then we see in print. This is because Verdana was designed to perform well on low resolution displays.

Verdana is a text font, it was also designed to work well at very small point sizes. Therefore, when set large, one may think Verdana is ugly. Vedana was designed for function; its '*ugliness*' comes from its many subtle adjustments and exaggerated features that help distinguish between similarities in letterforms.

Verdana

Verdana does everything right on screen.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890&@.,?!'"()

Verdana is Optimized for small text.

Verdana 12pt

Who would pack five dozen old quart jugs in my box?
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS!

Verdana 10pt

Who would pack five dozen old quart jugs in my box?
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS!

Verdana 8pt

Who would pack five dozen old quart jugs in my box?
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS!

Helvetica Neue 8pt

Who would pack five dozen old quart jugs in my box?
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS!

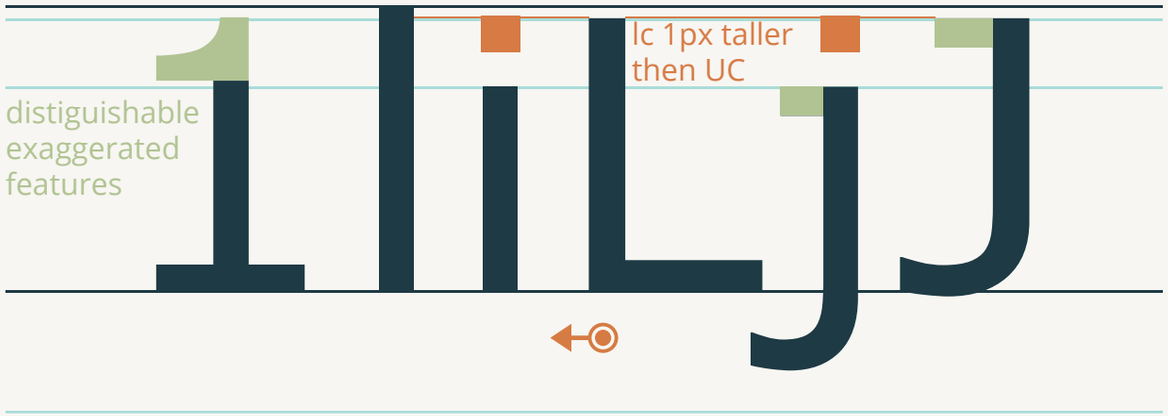
For example, the lowercase characters are a pixel taller than the uppercase at key point sizes. Notice how the lowercase ‘**i**’ is also slightly shorter than the lowercase ‘**l**’. This aids in the distinguishing of particular characters like ‘**1**’, ‘**I**’, ‘**l**’ (L), ‘**i**’ and ‘**J**’. Verdana’s curves were also reduced to a minimum in the counters to keep text crisp down to 8 points.

Verdana at first appears extended, but this is the effect of a tall x-height and extra spacing. In an interview with Matthew Carter he said,

> *“In Verdana, it’s the regularity of the spacing that’s just as important as the positive parts of the letterform. Wider spacing wasn’t enough, it also had to be more regular, this was the thing that gave it an advantage in readability. Verdana really isn’t wide, the sensation of width comes from the spacing.”*

This extra spacing ensures that letters never touch. We can see the care that was taken when looking at letter **combinations** such as ‘**fi**’, ‘**fl**’, and ‘**ff**’, as those letters tend to blur together creating hard-to-read blobs on-screen.

Verdana is packed with screen optimizations.



Spacing Comparison

Times New Roman 16pt
Pack my box with five dozen liquor jugs.

Arial 16pt
Pack my box with five dozen liquor jugs.

Georgia 16pt
Pack my box with five dozen liquor jugs.

Verdana 16pt
Pack my box with five dozen liquor jugs.

Times New Roman 8pt
Verdana’s wider letters and extra spacing makes it appear extended increasing readability at small text sizes.

Arial 8pt
Verdana’s wider letters and extra spacing makes it appear extended increasing readability at small text sizes.

Georgia 8pt
Verdana’s wider letters and extra spacing makes it appear extended increasing readability at small text sizes.

Verdana 8pt
Verdana’s wider letters and extra spacing makes it appear extended increasing readability at small text sizes.

Georgia

A Role Model Screen Serif.

Georgia is a king among screen fonts. Carter took the same strategy behind Verdana and applied it to the complexity of serifed characters. This is so remarkable because serifs typically blur on screen, details like curves don't fit within the pixel grid requiring tedious hinting to perform well.

However, Georgia looks sexy on screen. At large sizes, it could be **mistaken** for Times New Roman. On-screen in body-text sizes, it takes on its true purpose and remains clear at 8-12 points. Its x-height is larger than Times, but not as large as Verdana's, and the result is a face with more traditional proportions that renders exceptionally well.

Georgia and Verdana both have bolds that could be called ultra-bolds; just **compare** it to Times New Roman's bold. This ensures that you can always tell the difference between bold and regular, while their taller x-heights, open counters and extra spacing ensures that characters never fill-in, even at small sizes. Georgia and Verdana are role model screen fonts that help refine typeface anatomy for screen.

Georgia

Georgia is a king among screen fonts.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890&@.,?!'""()

Georgia is a screen serif that performs well at small font sizes.

Georgia 12pt

Who would pack five dozen old quart jugs in my box?
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS!

Georgia 10pt

Who would pack five dozen old quart jugs in my box?
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS!

Georgia 8pt

Who would pack five dozen old quart jugs in my box?
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS!

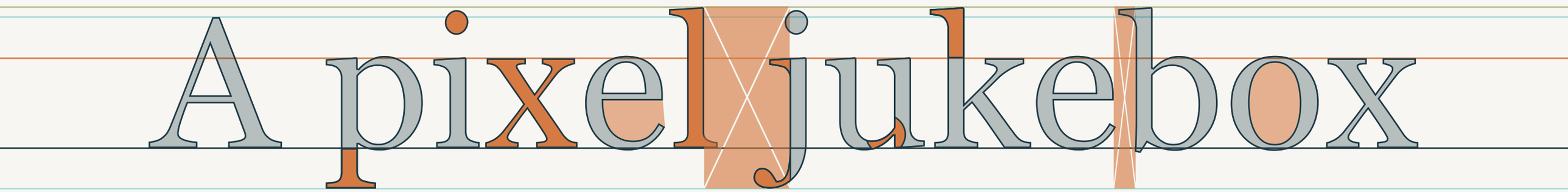
Times New Roman 8pt

Who would pack five dozen old quart jugs in my box?
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS!

Anatomy

ScreenType Anatomy

Tap to explore the anatomy of a screen serif.



cap-height ascent midline baseline descent

Georgia | Verdana

x-height

Use a taller x-height on screen.

x-height is the distance between the baseline and mid-line; it is the same height as the lowercase letter '**x**'. An increased x-height has one of the most noticeable effects on legibility and readability on screen. However, the reason we want a taller x-height is not so obvious. The short answer is that a taller x-height helps forms appear bigger at text sizes and therefore increases readability.

Lowercase letters are enclosed within the x-height. On the right, the letters '**a**', '**e**', and '**s**' were chosen as they each have three horizontal strokes occurring within the x-height; that is a busy space. On screen when pixels are in close proximity they **blur together** decreasing character distinguishability. A taller x-height like Frutiger's, forces the counters and apertures in this tight space open, and therefore we get more legible rasterized letters on screen.

Frutiger LT Std 55 Roman

"Geometry can produce legible letters but art alone makes them beautiful. Art begins where geometry ends, and imparts to letters a character transcending mere measurement." - Paul Standard.

Futura Std Book

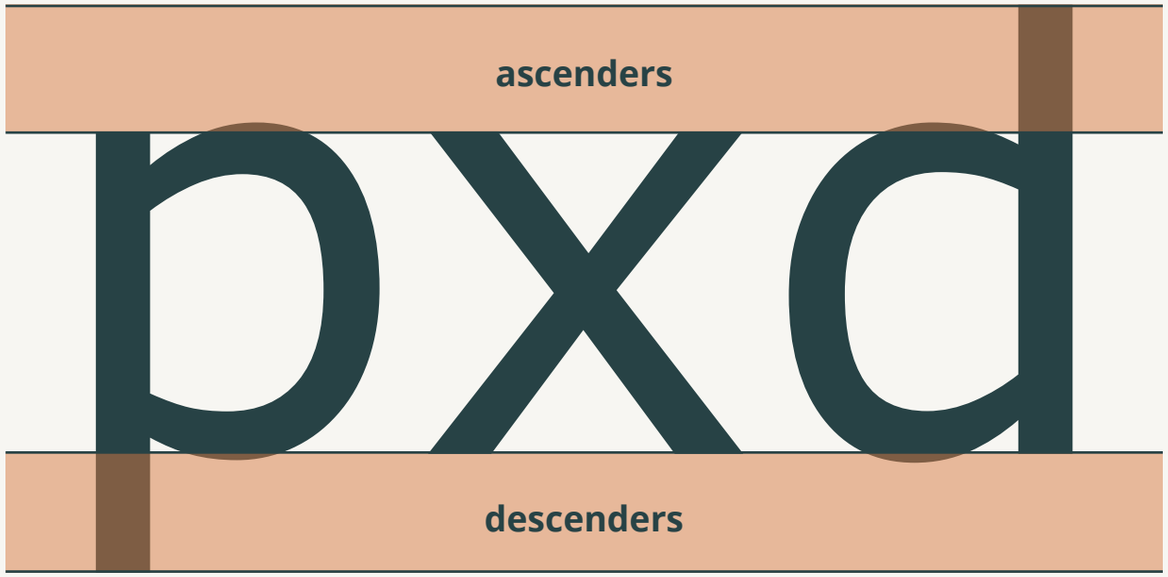
"Geometry can produce legible letters but art alone makes them beautiful. Art begins where geometry ends, and imparts to letters a character transcending mere measurement." - Paul Standard.

Ascenders & Descenders

Use a shorter ascent and descent on screen.

A taller x-height increases the space within glyphs making each character, especially the lowercase, more distinguishable. But where did that space come from? The more you **increase the x-height**, the shorter the ascenders and descenders become. This is because a fonts metric system is proportional. However, this is not a consequence but another advantage of a taller x-height.

On the bottom right we see a typographic nightmare, a paragraph with a slew of ascenders and descenders. Notice how the taller x-height and shorter ascenders and descenders in **Georgia** and **Verdana** creates a more legible paragraph then a font with a shorter x-height and taller ascenders and descenders like Caslon and Futura. The shorter ascenders and descenders give the main features of letterforms as much space as possible while ensuring lines of type never touch. Short ascenders and descenders prevent lines from intersecting when set close together, making them very effective for text on screen.



short x-height	tall x-height
Futura (bad)	Verdana (good)
Subgraph fight tidy bit kilt plight tip filthy flip lift light bid tight flighty pit guilt fly jig bedquilt jilt fill gift lillypilly glyph kit bight lid kip blip dip flit pity fig hit pitch big hid fit lip ribgrass pig dig till blight hip light glide headlight.	Subgraph fight tidy bit kilt plight tip filthy flip lift light bid tight flighty pit guilt fly jig bedquilt jilt fill gift lillypilly glyph kit bight lid kip blip dip flit pity fig hit pitch big hid fit lip ribgrass pig dig till blight hip light glide headlight.

Distinguishability

Glyphs should be distinguishable from each other.

One of the single most important legibility features of a text font is character distinguishability. Distinguishability is the characteristic of a letter that makes it easily told apart from every other letter. This is why it is important that a typeface follows a familiar skeleton. The letters ‘**R**’, ‘**a**’, ‘**n**’, ‘**g**’ and ‘**Q**’ were chosen for this example on the right because they carry the personality traits and characteristics of a font.

Distinguishability is rooted in a fonts design. The one-story ‘**a**’ in Futura is distinguishable, it follows a familiar skeleton that is distinct in headlines. But when viewing conditions are low and we have less pixels to fill, distinguishability becomes more and more difficult; that ‘**a**’ could become a ‘**o**’ or a ‘**c**’ at smaller font sizes. We will almost always make the decision that it is an ‘**a**’, we read words, but the time it took to come to that decision hindered reading speed.

R a n g Q

Familiar Skeleton

Frutiger LT Std 55 Roman

Intraocular
Intraocular
Intraocular
Intraocular
Intraocular
Intraocular

Futura Std Book

Intraocular
Intraocular
Intraocular
Intraocular
Intraocular
Intraocular

Exaggerated Features

Exaggerate the differences.

To make a font distinguishable at small screen and font sizes, you will often need to exaggerate features to help distinguish commonly confused letterforms like the number '**1**', lowercase '**l**' (L) and uppercase '**I**'. This is why many screen fonts feel awkward at large sizes, what you are noticing are its exaggerated letterforms. Typefaces like Georgia and Verdana that were designed specifically for legibility on screen; have exaggerated metric systems and letterforms. These features offer excellent legibility on screen but often look massive when printed on paper.

Letters like '**hn**' or '**1lil**', can often only be differentiated by their **contrasting ascent heights**. A font with a taller x-height leaves little room for ascent and decent features. The best solution is to **exaggerate the differences** rather then the similarities in these letterforms. In Verdana, the '**1**' was given a base and a hook to distinguish it from the lowercase '**l**' (L) and uppercase '**I**'. The lowercase '**j**' and uppercase '**I**' were given bars. The lowercase '**i**' and '**j**' are **a pixel taller** than the cap-height.

Curves

Use straighter curves.

The fewer details a letterform needs to convey its character, the more legible it will be on screen.

A glyphs Bézier curves get moved around the pixel grid at each font size. As we already learned, anti-aliasing smooths these curves. But, the smaller the font size the more compacted curves become. On screen, detailed curves can end up blurry from too much anti-aliasing. For this reason, curves should be reduced to a minimum in the counters. Straight lines and clear forms work better then subtle angles or curves. It is this reason a sans serif is often recommended for text on screen.

Georgia *The Good* Palatino *The Bad* Optima *The Ugly*

Spacing

Use wider more regular spacing.

Just like shorter ascenders and descenders, wider letter and word spacing prevents letters and lines of text from intersecting. It is very important that lines of text and pairs of letters, their pixels, never 'touch' on screen as they are quick to **blur together or fill in**. This is especially true when rasterized at small text sizes. For this reason, screen fonts typically have wider spacing then print fonts.

This wider spacing is also a product of the exaggerated metrics system; a glyphs left and right sidebearings should be proportional to the counters and form of each character. More generous counters and a taller x-height lead to wider sidebearings. However, wider sidebearings are not enough when we start talking about letter combinations. Fonts like Verdana seem wide because they are intended for small text on screen. The smaller the point size, the more space is needed between letters to keep them distinguishable.

See how letter spacing and word Spacing affects readability.

Do Not Touch! Tight spacing causes letters to blur together.

Gotham Condensed 14pt

"Give me a laundry list
and I`ll set it to music."

—Gioacchino Rossini

Gotham 14pt

"Give me a laundry list
and I`ll set it to music."

—Gioacchino Rossini

Bodoni 14pt

"It is a rarer gift to lay words out properly than to write them"

— Nicholas Barker

Georgia 14pt

"It is a rarer gift to lay words out properly than to write them"

— Nicholas Barker

Counters and Apertures

Use generous open counters and apertures.

A typeface with a small x-height can be difficult to read, it results in small counters and apertures in lowercase letters. **Counters** are the openings that allows white-space to move in and out of the counterforms of a glyph. Generous counters help forms remain open and aid readability when rasterized. **Apertures** are the openings at the end of an open counter. Large apertures result in larger counterforms and therefore more readable text on screen.

If you look at the ‘**a**’, ‘**c**’, ‘**e**’, and ‘**s**’ in **FF Meta Pro**, you can easily see how the letterforms feel open. Comparing fonts with similar sized counterforms, like Frutiger and Helvetica, shows the **effects** negative space has on screen. Helvetica’s apertures are more closed off than Frutiger’s. Because of this, white space inside and between Helvetica’s letters (its counterform) is more closed off. In consequence, the letters fill in on screen. This is very clear when **magnified 3200x**, notice how Helvetica’s ‘**e**’ has a one pixel aperture while Frutiger has two pixels to work with.

FF Meta Pro

aces

Frutiger LT Std 55 Roman

xasce

“Geometry can produce legible letters but art alone makes them beautiful. Art begins where geometry ends, and imparts to letters a character transcending mere measurement.”
- Paul Standard.

Helvetica LT Std

xasce

“Geometry can produce legible letters but art alone makes them beautiful. Art begins where geometry ends, and imparts to letters a character transcending mere measurement.”
- Paul Standard.

Contrast

Use lower contrasting strokes.

A less pronounced weight contrast is an important trait on screen. The thin strokes in a font like Bodoni are more difficult to distinguish then the thicker thins in Droid Serif on a back-lit background. Monolinear typefaces may seem idea but stroke contrast is needed for legibility at small text sizes. There is no clear answer on exactly how much contrast is idea. However, both no contrast and too much contrast can hinder legibility on screen.

To convert Minion Pro into a **web font** the x-height was slightly raised forcing the counters open and the thins and serifs were made thicker proportionately. Thicker thins help ensure that the stroke fills a pixel(s).

Bodoni 14pt High Contrast

"Bodoni would be an admirable letter for a death notice!"

— G. W. Ovink

Droid Serif 14pt Low Contrast

"Bodoni would be an admirable letter for a death notice!"

— G. W. Ovink

contrast

Minion Pro	Minion Web Pro

Minion Pro 14pt

"You cannot understand typography and typefaces without knowledge and you can't keep that knowledge for only yourself. Type design is a cultural act, not just a few lines of data in the corner of a hard disk."

—Jean-François Porchez (1964)

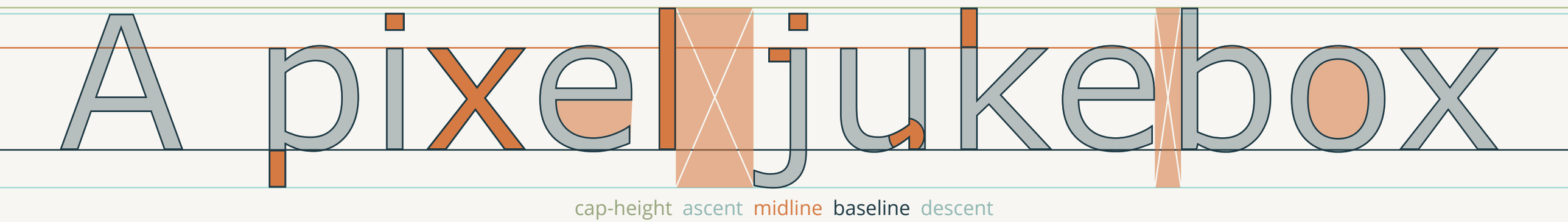
Minion Web Pro 14pt

"You cannot understand typography and typefaces without knowledge and you can't keep that knowledge for only yourself. Type design is a cultural act, not just a few lines of data in the corner of a hard disk."

—Jean-François Porchez (1964)

ScreenType Anatomy

Tap to explore the anatomy of a screen sans-serif.



Georgia | Verdana

Using Type on Screen

Sans vs. Serif

Does it really matter?

Every study has produced the same inconclusive result; in many ways it is a battle of preference. It depends on what an individual is more accustomed to reading and what fits the content and context. If you were to ask history, the serif wins the battle. This is because serifs aid the flow of reading across lines of text, increasing reading speed and aiding eye fatigue. This is great for long texts but the way we read and write content is different on screen; it is rare to come across long texts.

The screen, well screen users, favor a sans serif. This is because we are accustomed to reading a sans serif on screen. Technological limits resulted in blurry serifs for decades. Therefore, it is difficult to say with any certainty one is more readable then the other or if we just prefer what we are used to. However, there is still to this day solid logic behind our sans-serif favoritism. The screen renders simple forms and straight lines clearer and thus a sans serif fits more snuggly within the pixel grid.

Will these two ever stop this silly battle?

A serif that works as well on screen as it does in print is like finding Waldo. In print, serifs are small, but on screen a serif has to fill at the very least two pixels. In addition to this, they have to be proportional to an exaggerated metrics system. This leads screen fonts to have larger serifs that can hinder the legibility or recognition of individual letters.

It is true serif fonts don't perform well on screen, but that doesn't mean they can't. What makes Georgia so successful is its hinting. Hinting is the expensive and time consuming process of instructing a fonts individual pixels at certain pixel sizes. A well hinted design can be clearly readable on screen, but that same design can be unreadable if displayed unhinted.

Readability is in many ways another word for transparency. A typeface should never get in the way of the content it is communicating, it should be invisible. Readability is a measure of function, it depends on how a typeface is used and getting a viewer to read the content. Each and every typeface was designed for a context, some are display faces while some are for text or perhaps a face was designed for small print or cheap paper. The point is you need to select the right typeface for the job, one that fits your medium, intent, content, and audience.

Georgia 12pt Hinted & Rasterized

Hinting is an expensive time consuming process on instucting a fonts individual pixels at certain sizes. A well hinted design can be clearly readable or unreadable if unhinted on-screen.

Georgia 12pt Unhinted & Rasterized

Hinting is an expensive time consuming process on instucting a fonts individual pixels at certain sizes. A well hinted design can be clearly readable or unreadable if unhinted on-screen.

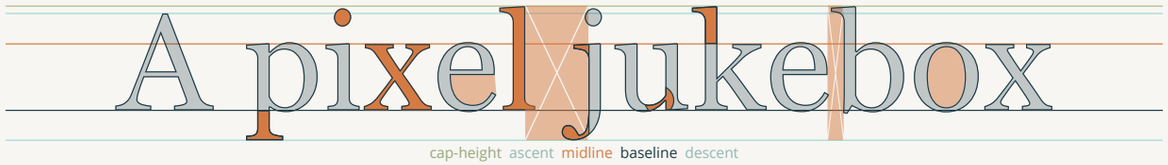
Selecting a Screen Font

Not every font is a screen font.

It seems like every font is now available as a webfont. But, just because you can use your favorite font ever on the web, should you? The reality is, it takes a rock star web font to justify using a web font at all. A web font needs to stand up to the tried and true fonts like Georgia or Verdana to be worthwhile in text.

So far this book has looked at typeface design for screen, which is different from the text treatment a graphic designer performs on a web page. However, the same principles, proportions, and metrics that drive a screen fonts construction, helps designers of all kinds select the right face for the job. Though, no matter the font, how well it performs depends on the designers decision to use and execute a typeface in a particular context.

When choosing a typeface for screen, look for the features discussed in the **Anatomy** section of this book: ample space between letters, words, and lines, lower stroke contrast, a taller x-height, and open counters. However, factors like the line length, leading, or the contrast between the foreground and background allow a well designed screen font to perform the task it was designed for.



A tall x-height does not always result in good screen performance. Here are two well known fonts, Helvetica and Frutiger, you have most likely worked with them before. Both have similar sized counterforms and metrics. However only one of these fonts performs well on screen. The larger apertures and looser spacing in Frutiger makes it a better screen choice. Helvetica's letters are more closed off and in consequence those letters **fill in**.

Frutiger LT Std 55 Roman

x-aces

"Geometry can produce legible letters but art alone makes them beautiful. Art begins where geometry ends, and imparts to letters a character transcending mere measurement."
- Paul Standard.

Helvetica LT Std

x-aces

"Geometry can produce legible letters but art alone makes them beautiful. Art begins where geometry ends, and imparts to letters a character transcending mere measurement."
- *Paul Standard.*

Just because a font has the right characteristics doesn't guarantee it will perform well on screen. There are however methods to test a fonts screen performance before you buy it.

Testing for Screen

It is all about performance.

1. One of the single most important legibility features of a text font is character distinguishability, make sure each character is easily distinguishable at your intended font size.

2. Make sure the family in question has high contrasting weights and that the bolds are not so bold they fill in.

3. Check that the counters don't close up, particularly look at the problematic letters, **a**, **g**, **e**, and **s** in regular and bold.

4. Make sure the ascenders and descenders have enough space, particularly look at the **f** and **g**.

5. Look at the rounds, **b**, **d**, **p**, **q**, and **o**, to see if they are open enough and have the same optical size and color as the square forms, **h**, **n**, **m**, and **u**.

6. Remember the golden rule, differentiation. To test, look at the **I**, **i**, **l** (L), and the numeral **1**. If you still are in question, look at the **3** and **8** or the **5** and **6**.

Roboto 16pt

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890&@.,?!'“”()

hamburgevons *hamburgevons*
Roboto Regular

ages **ages**

fg
gf

hnmu

lil1

Pairing Screen Fonts

Finding the right match.

Pairing fonts for screen use is not very different then how we pair fonts in print. As we have learned, a tall x-height is the main identifying feature of a screen font, what we want is to match that height as closely as possible between the text and heading fonts.

If we wanted to pair a serif with Open Sans, we would compare our contenders with the x-height of Open Sans, in this example we would pick **Georgia**, exactly like this book is set. So the way to pair screen fonts is by comparing their vertical proportions or x-heights, the height of the lowercase letter "**x**".

Another great way to pair fonts is to use a typeface that has both a **Sans and Serif** version, like Droid Sans and Droid Serif. This will be the closest match possible as they were built using the exact same metrics and proportions.

With so many fonts, it is hard to find the right pair.

Font Size & Line Length

It is all relative.

You can use any typeface on screen, as long as it is large enough. At larger sizes, all the rasterization issues we have been talking about disappear. This is one of the reasons this book concentrates on text fonts, the screen's weakness. The smaller the type size is on screen, the more careful one must be about their typeface choice.

On screen users struggle particularly with small text, especially users with visual impairments. Small text causes eye fatigue on screen. On a typical desktop display, a good rule of thumb is to set your text at 50-75 characters per line at a font size of 16px (pixels). On a smartphone that is about 30-40 characters per line.

Coming from print, 16px text seems huge compared to 10-12pts. A 40 year old retina only lets in half the light of a 20 year old retina and by the time one hits 60, only 20% of that light gets in. In a medium dependent on light this becomes a serious accessibility problem and is the most general reason we want bigger type on screen.

The other reason we use 16px is the distance we read from on screen. Legibility and reading speed is directly impacted by ones distance from the text. Think of the font size on a billboard or TV for example. The average distance from a desktop screen is 23 inches and 28 inches is the recommended distance for your eye health.

If you take distance, PPI, and the medium into account, 16px on screen is the same as 12pt on paper. Take a printed book and place it 28 inches away from your eyes and try and read it. Screen size, resolution, PPI, and distance all influence the idea font size. A tablet for example is different from a desktop screen, like a book, we hold it in our hands, it is closer. On top of that the PPI is often higher, there are more pixels per square inch. This is why you can get away with 14pt type on a HD or high PPI screen. But, when you take into account the sea of variable devices, resolutions, and pixel densities, 16px is much safer choice.

Color & Contrast

Use high contrast but avoid the extremes.

Text is easier to read when there is a sufficient contrast between the text and the background. Web Content Accessibility Guidelines (WCAG) 2.0 level AA compliance requires a contrast ratio of 4.5:1 for normal text and 3:1 for large text. Level AAA compliance requires a contrast ratio of 7:1 for normal text and 4.5:1 for large text.

However, high contrast such as black on white can cause eye strain on screen. Pure black is harsh. It is nearly impossible to find something physical that is pure black. Roads aren’t black. Coal isn’t black. Ink isn't black. This text isn't black. Is anything really black? On top of that the glaring white background of the screen is exhausting. White paper is not white, it is viewed by the reflection of light and takes on color from the surrounding environment. Therefore an off black text on an off white background (like this page) is idea, it basically simulates printed material.

Appendix

Your basic anatomy

Just tap an orange letterpart to learn more.

A very quick introduction to letterform anatomy. The typographical cheat sheet!

Reveal All | Line Terms | Reset

Final Thoughts

The end is just the begining.

At this point we learned all about the medium (screen), dissected the rock stars Georgia and Verdana, discussed the characteristics and anatomy of a screen typeface, and learned how to select, pair, and set type on screen. Although this marks the end of our time together, it is not the end of screen type development. Each and every day technology continues to lift the limits and blur the lines between the digital and printed page. We are no longer limited to a handful of fonts but afloat in a sea of them. The only limit left is the one the medium opposes on us. As we break away from the tried and true and push the boundaries of on screen typography, we must remember what and who we are designing for. Not every typeface is a screen face and not every screen face is right for the job.

Every word in this book aimed to help you through the growing pains of type in the digital age. However, a smart man who taught me almost everything I know about typeface design once told me after teaching typography for twenty years that you can't teach typography. All one can so is hope to instill a passion for type and help you see form in a new way. A typeface is only as good as its intentions. Whether you are designing the next typeface or selecting the right one for your job, I hope the content of this book makes your font or design the next rock star.

Sincerely,
Rhett A Forbes
designer

End.

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Give credit where credit is do.

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Special thanks to the students of GRDS764 Typeface Design, Professor Trudy, all my testers, and the many brains I picked along the way!

Continue Reading

Glossary

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

/1!'/

@font-face a CSS rule that allows you to define and load custom fonts in the browser.

A

Accessibility the degree to which an environment is available to as many people as possible. On screen it is the measure at which people with disabilities can use the Web.

Additive Color System color created by mixing red, green, and blue light.

Aliasing the jagged horizontal zigzags of curved or diagonal lines on a low-resolution monitor.

Anti-Aliasing techniques that combat aliasing.

Apertures the enclosed, somewhat rounded negative space in a glyph.

Ascender a part of a lowercase letter that extends above the x-height.

B

Baseline an invisible line where characters sit

Bold set of type characters that are darker and heavier than normal.

C

Cap-Height - the height of capital letters that don't overshoot—such as E, H or I

Cascading Style Sheets (CSS) a style sheet language used for describing the look and formatting of a markup document.

Character a single character in a font or a typeface

Contrast 1) a measure of visual weight differences between the thick and thin strokes of a glyph **2)** a measure of the color difference between the foreground and background.

Counter the open space in a fully or partly closed area within a letter.

Counterform negative spatial areas defined and shaped by letterforms, including counters, apertures, and the spaces between characters.

CSS - see Cascading Style Sheets

D

Descender The part of letters that extends below the baseline.

Distinguishability the characteristic of a letter that makes it easily told apart from every other letter. Also see legibility and readability.

Dots-Per-Inch a measure of the number of individual dots that can be placed in a line within the span of 1 inch in printed material.

DPI see Dots-Per-Inch

E

Em a unit equal to the value of the ‘font-size’ property.

F

Font-Stack fonts listed in order of preference in a CSS font-family declaration.

G

Glyph see character.

H

Hinting process of instructing a fonts individual pixels at certain sizes

HTML HyperText Markup Language, a set of standards to tag or markup a hypertext document (web page).

L

Legibility the quality of being clear enough to read.

Letter-Spacing (also known as tracking) is the adjustment of the horizontal white space between letters.

Line-Spacing the vertical distance between lines of text (also known as leading)

M

Metric(s) (font) typographic information (proportions, width, height, kerning, etc.) in a font.

O

Optical (Size) in relation to sight, the size it appears not its mathematical value.

P

Pixel one of many illuminated areas on a screen that compose an image.

Pixels-Per-Inch a measurement of the pixel density of a screen within the span of 1 inch.

PPI see Pixels-Per-Inch

R

Rasterize convert an outline into pixels that can be displayed on a screen.

Readability the ease with which text can be read and understood.

Resolution the number of pixels on an entire screen surface.

Retina screens with a resolution and pixel density of 300PPI or more.

S

Sans-Serif Typefaces without serifs.

Screen area on an electronic device such as a television, computer, or smartphone, on which images and data are displayed.

Serif Elements added to the ends of the main strokes of a letterform in serifed type styles.

Subpixels the red, blue, and green units that make up a pixel.

Subtractive Color System is the mixing of a limited set of dyes, inks, paint pigments or other colorants to create a wider range of colors, each the result of partially or completely subtracting (that is, absorbing) some wavelengths of light and not others.

T

Text in this book, it is referring to body text, what you are reading right now, text under 16pt.

W

Web Content Accessibility Guidelines (WCAG) a single shared standard for web content accessibility that meets the needs of individuals, organizations, and governments internationally.

Web Font - A web font is a typeface installed with a web browser. The term is also used to describe typefaces that can be used on screen.

Word-Spacing The negative space between words in a block of type. Word-spacing plays a key role in establishing the color, texture and readability to type.

X

X-Height - The height of the lowercase letter x in a font.