

**ustwo**

# PIXEL PERFECT PRECISION

Version 3

Produced by ustwo

@ppputwo

@gypsy

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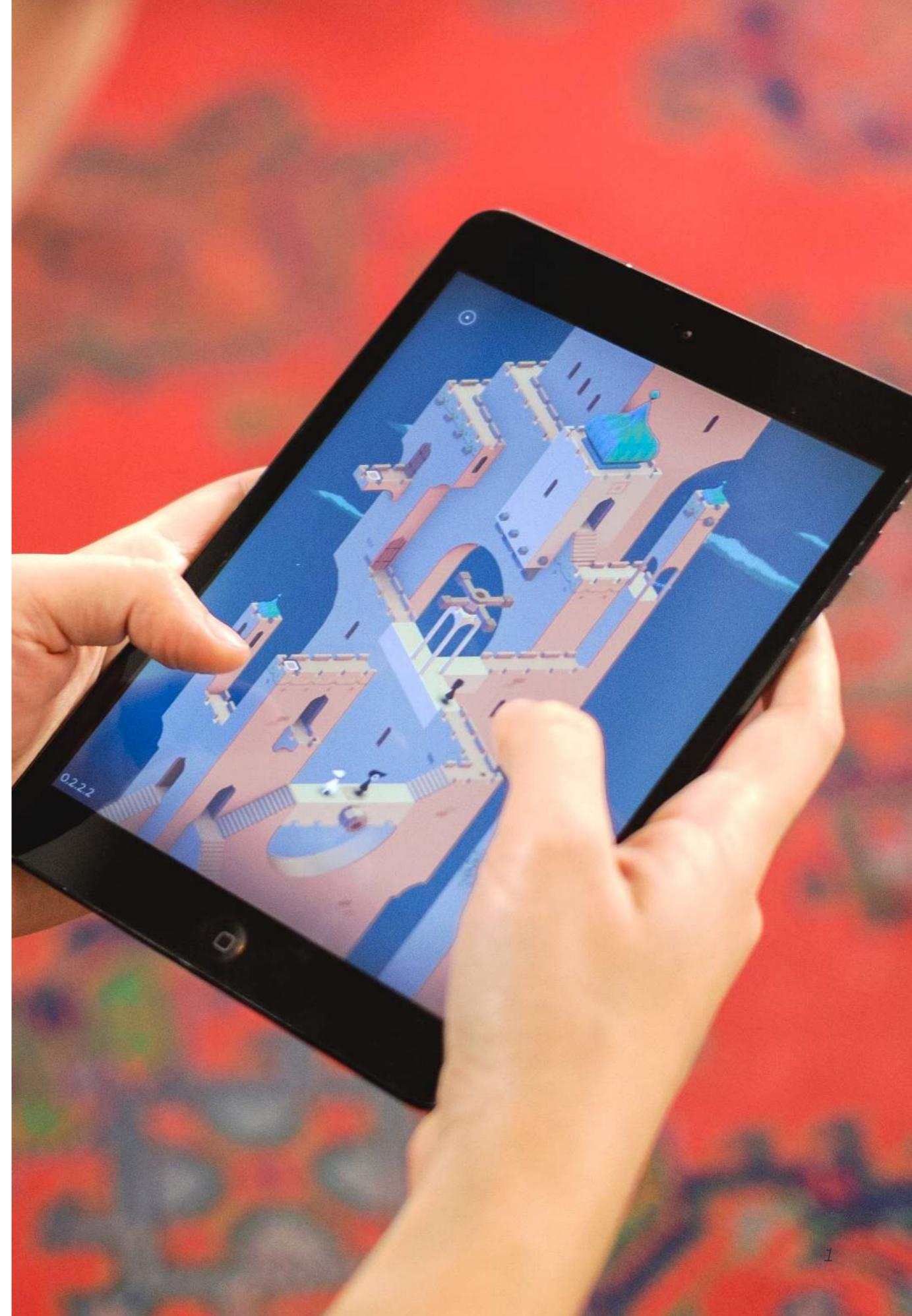
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# INTRO

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The Pixel Perfect Precision Handbook is now four years old. Over that time we've shifted the focus away from pure pixels and started to cover more about how we work as well — the new chapter on Design and Development is a perfect example of this. Even though our portfolio is incredibly diverse, from mobile banking apps to physics-defying puzzle games, we always apply the same design principles that we talk about in the following pages. Enjoy!

*Product photo: [Monument Valley](#)*



# THANKS

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There's a few people out there who deserve a shout out. First of all Shiro, for showing me the true meaning of pixel precision all those years ago. All the designers out there sharing their knowledge on a daily basis — you've been a great source of both inspiration and information. Most of all I'd like to thank all my friends at ustwo for their immense support in creating this handbook!

*Product photo: Rando*

*Pixel Perfect Precision*



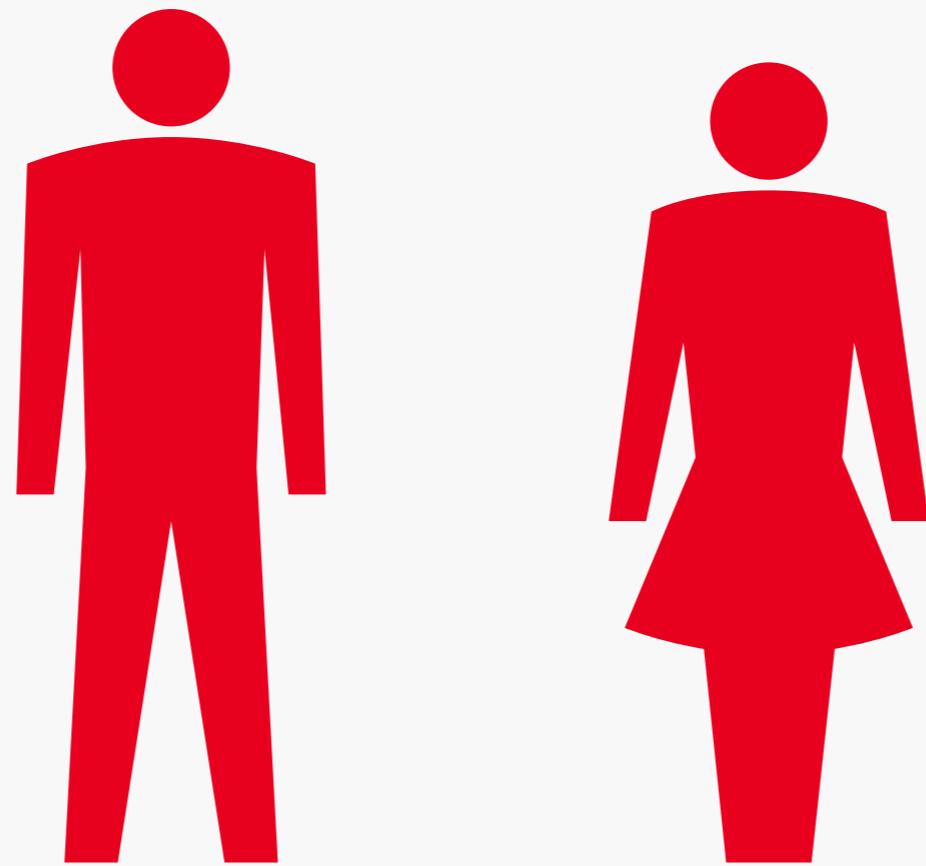
# THE CORE

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This first section covers core principles and topics that apply to digital design and its relevant tools. Applicable to both seasoned professionals and newcomers to the field, it offers a quick start guide to some of the processes and thinking that we apply to our projects here at ustwo.



# **PIXEL PERFECT PRINCIPLES**



# Users

Your primary consideration should always be your users. Guide design decisions by finding out what they want to do, and then structure your product so they can carry out that task as quickly as possible. Always bear in mind what is suitable for them as well; for example, a

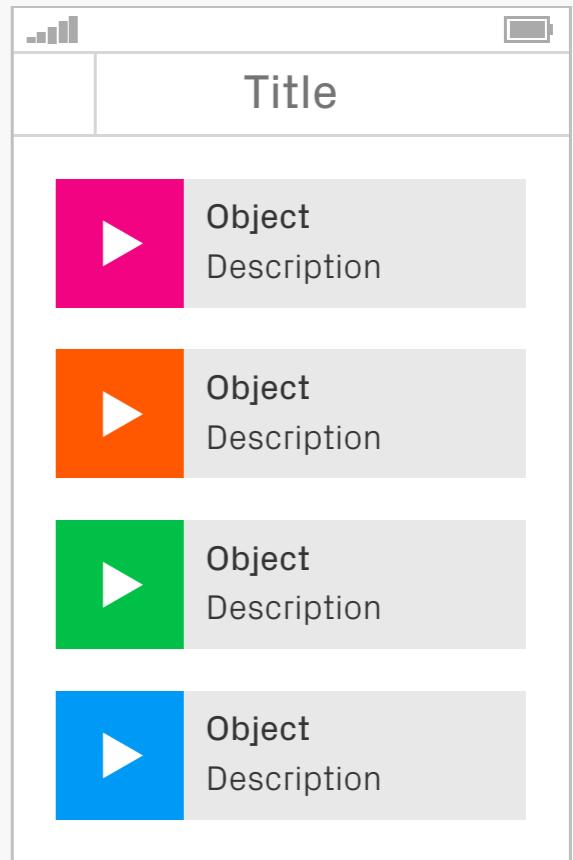
completely flat, cutting edge interface guided by grids and typography may work for a younger audience, but perhaps some friendlier skeuomorphic touches would be more appropriate for older users who aren't quite so tech-savvy.

# Environment



Environment refers not only to the platform you're designing for, but also how it will be operated and the physical space that it will be used in. For example, TVs have a completely different set of variables to mobile phones — they are viewed from a much greater distance,

almost always used indoors, and operated via remote. This in turn means different considerations for things like text size, colours, and contrast within the interface.



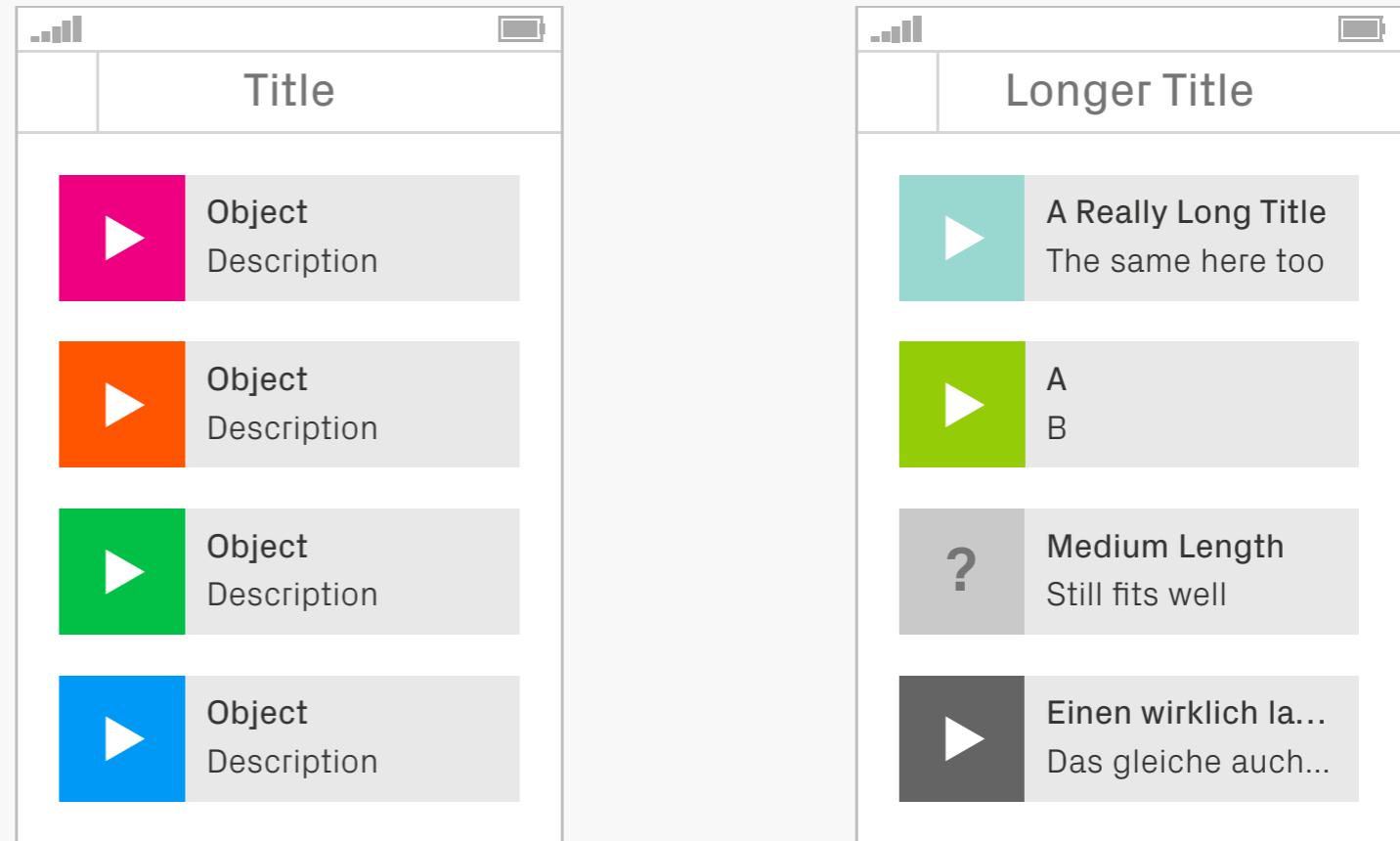
✗ Naughty

## Accessibility

Accessibility is relevant to every one of your users — not just those with some kind of disability. Good practice such as ease of use and clarity are a given, but there are also steps you can take to make your work more accessible for those with conditions such as

colour blindness and dyslexia. See the [Accessibility](#) chapter for more information.

✓ Nice



## Best-Case

# Worst-Case Scenarios

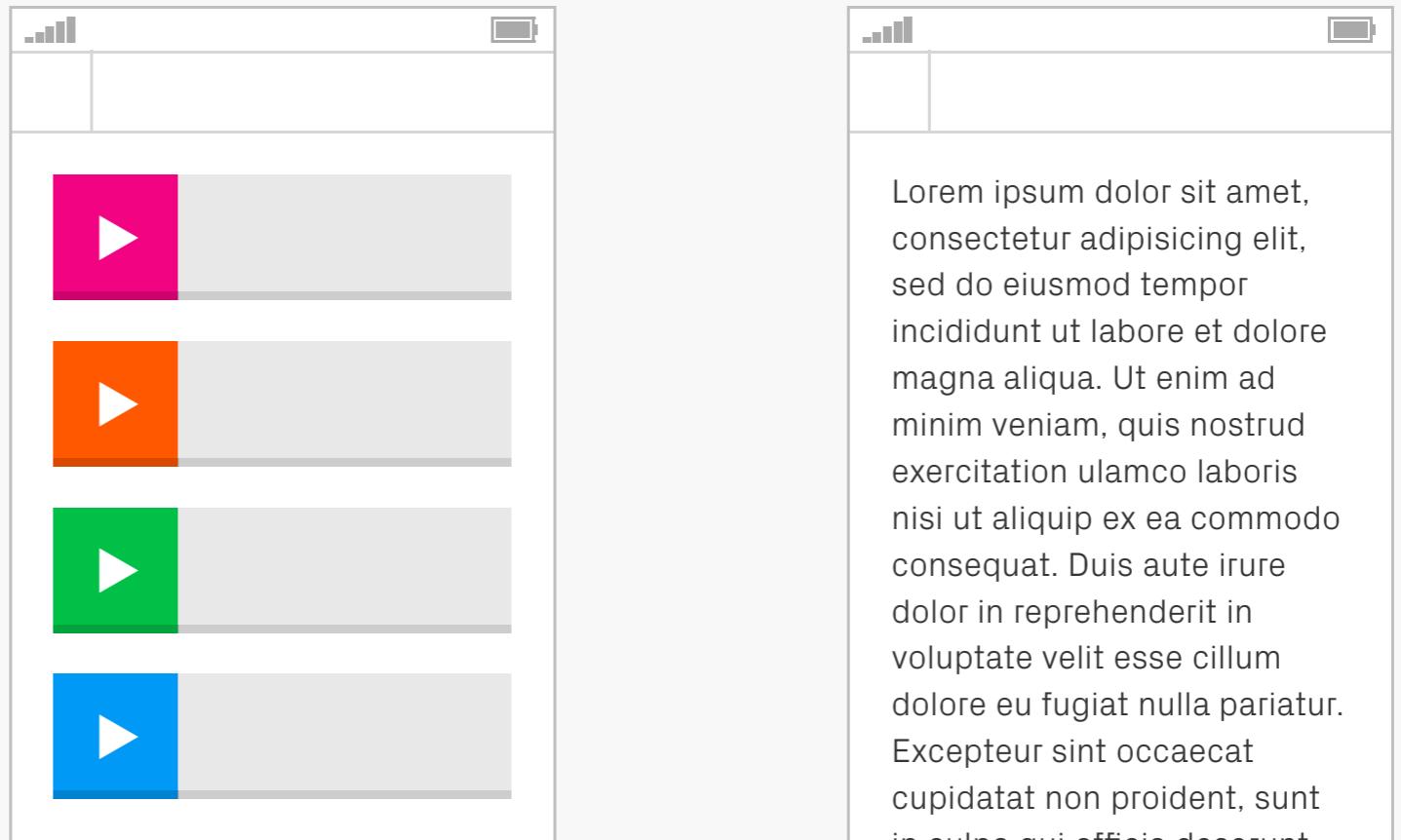
This principle has some ties to accessibility: make sure your product doesn't break in real situations with real users. We're all tempted to put in artwork and text that looks beautiful and impresses clients, but it's also necessary to check that your design works with longer

## Worst-Case

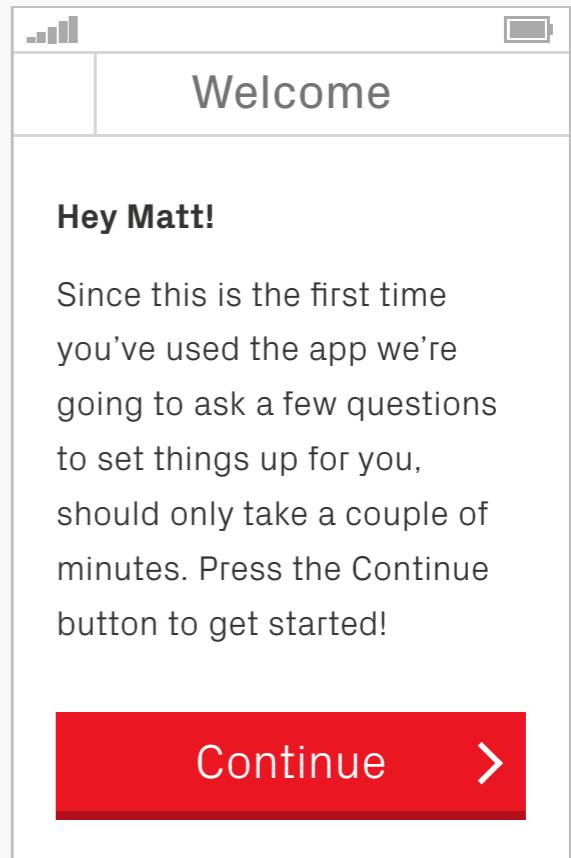
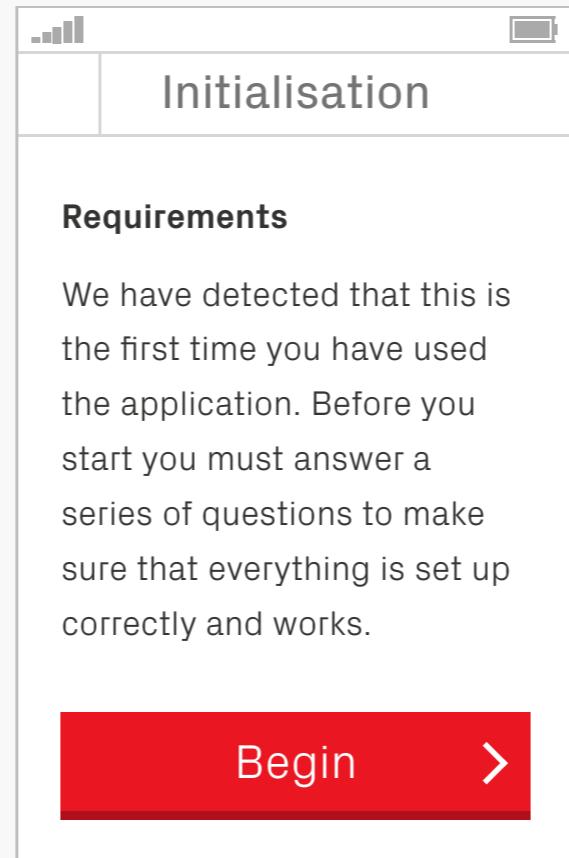
blocks of text, translations, missing or highly varied images etc. You can still show off the pretty version, but have some of these options available in your files to check now and then.

# Affordance

Affordance is an object's ability to convey its function through sensory means, for example a button suggests that you press it by being slightly raised; a door handle suggests that you pull it by being the right size and position for a hand. This technique can also be used in



digital design to lead users into interacting with objects. Commonly used affordances include buttons which are given depth to emulate the real world, and text which flows off the page to show that it scrolls.



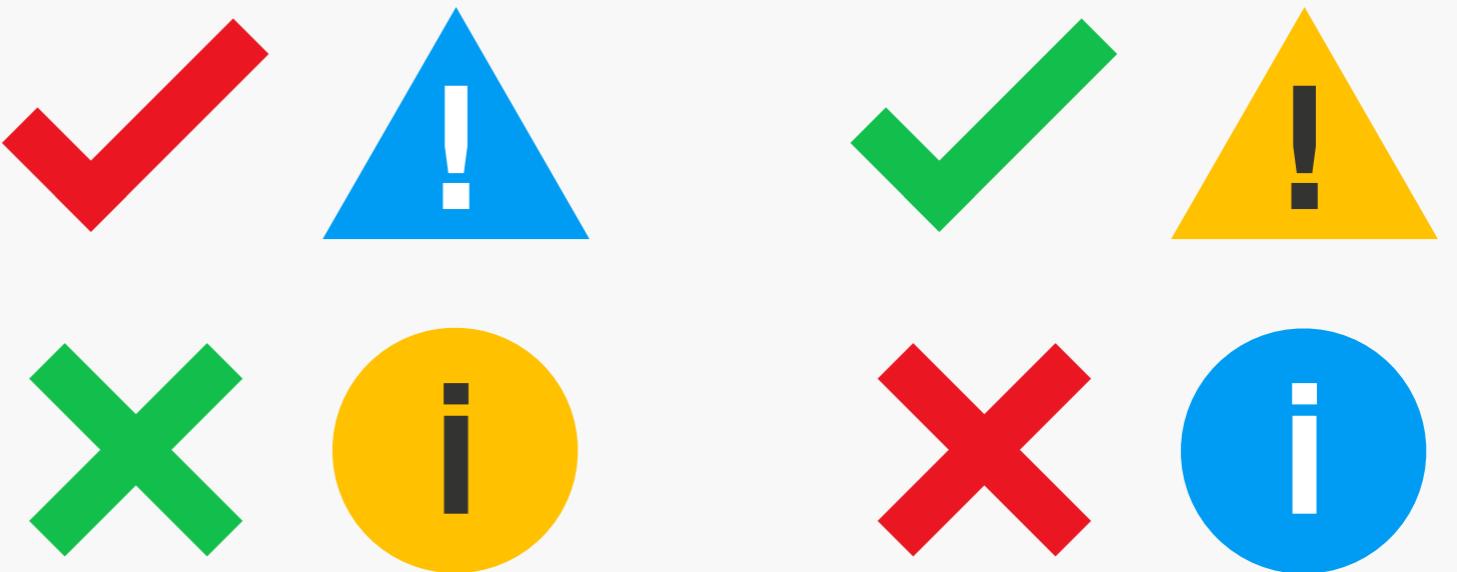
✗ Naughty

## Copy

What you say in your design is just as important as how it looks. Good copy can not only make an app easier to understand, but also gives it personality through the tone of voice used. Speaking to people like human beings, rather than machines, creates an

✓ Nice

emotional connection that results in a better experience with your product.



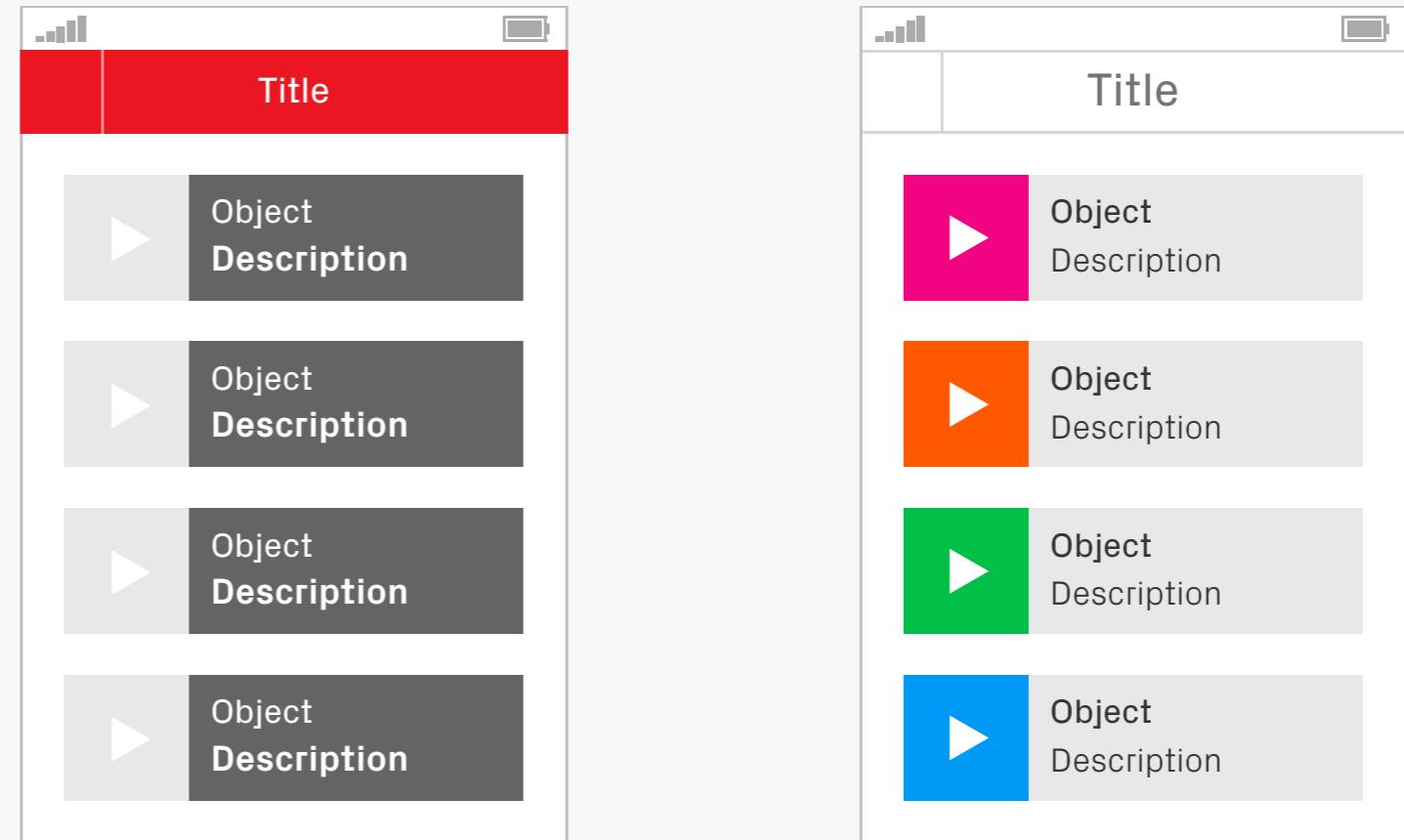
**✗** Naughty

**✓** Nice

## Colour and Shape

Certain colours and shapes have become synonymous with specific meanings in digital design. Be mindful of these norms, as mixing them up can cause confusion for the user. Green and ticks are commonly used to indicate good, likewise red and crosses bad,

but jumbling the two up creates a mixed message. Similarly, yellow and triangles are often associated with warnings, blue and circles with information.



**✗ Naughty**

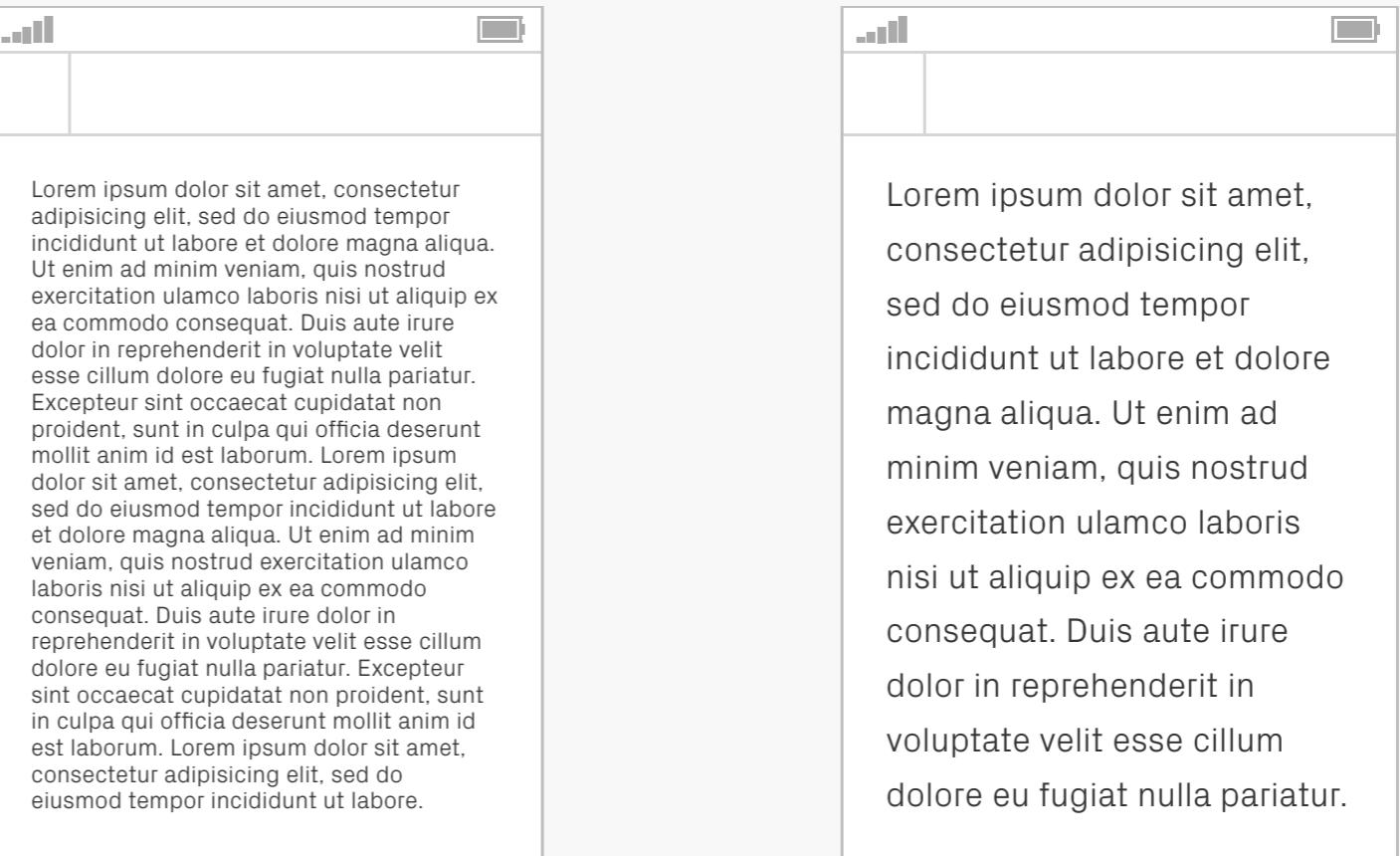
## Visual Hierarchy

Layout, colours and typography have a huge influence on what the eye is drawn to, and consequently how information is consumed. Think about what you want the user to look at on the page and in what order, then design around that hierarchy. Grab attention with high

contrast and large, bold type, or push items back with lower contrast and smaller, lighter type. Culture also plays a part: for example Westerners will naturally start near the top left of a screen as that's the way we read.

# Typography

Typography is often overlooked in digital products, but since most information is conveyed through text it should be high on your list of priorities. Apply the same basic principles as for other mediums: is it a comfortable size for reading without



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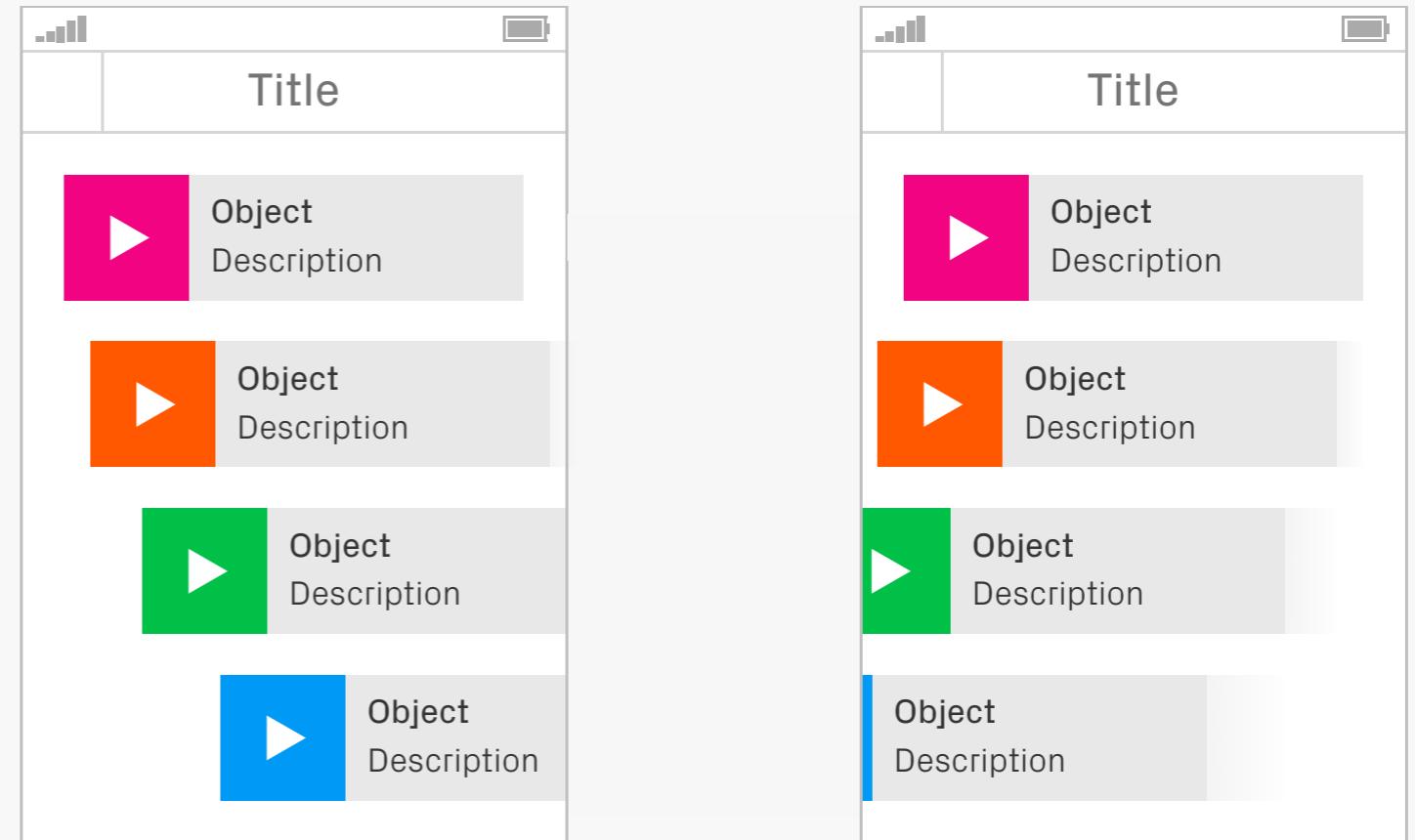
✓ Nice

squinting? Is there enough leading and are the line lengths short enough to make reading comfortable? Don't just accept the default font settings in your design environment — treat type with the respect it deserves!

# Motion

With the ever-increasing power of hardware it's now possible to make your designs not only look good, but also move elegantly. Subtle animations can enhance interfaces, giving them character and increasing their intuitiveness by hinting to functions and

features; for example, if you wanted to draw attention to a new button you could make it periodically bounce to catch a user's eye.



## Enter

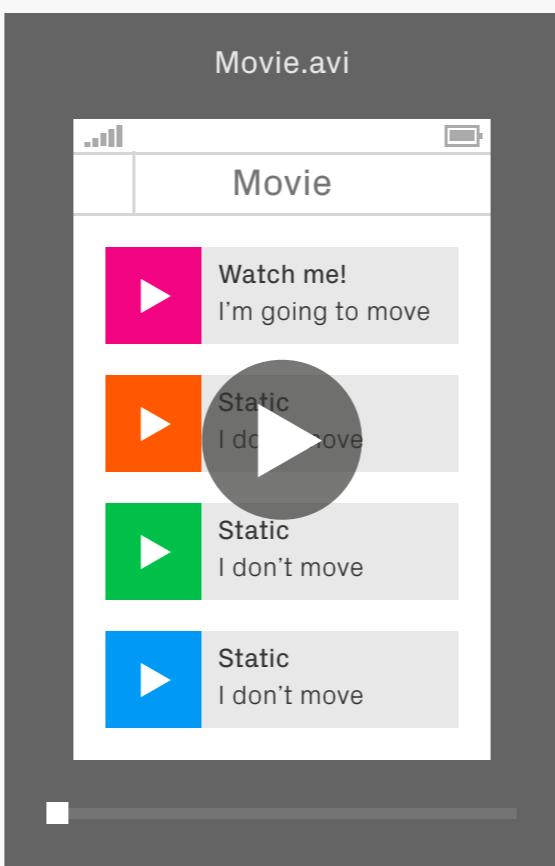
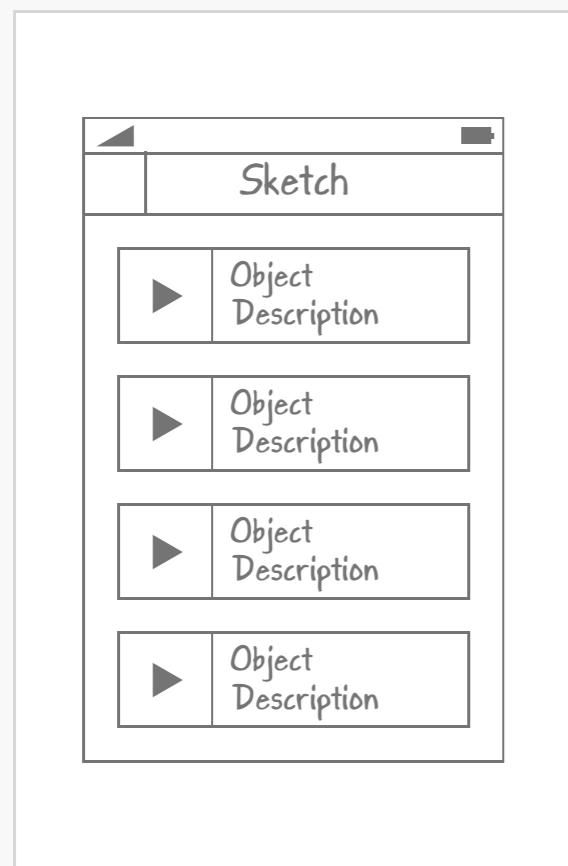
## Exit

# Testing



Nothing beats testing designs on their intended device. Screen resolution and technology can vary dramatically compared to your computer, as well as other variables like viewing angles and input methods. There are a wide range of live previewing tools available

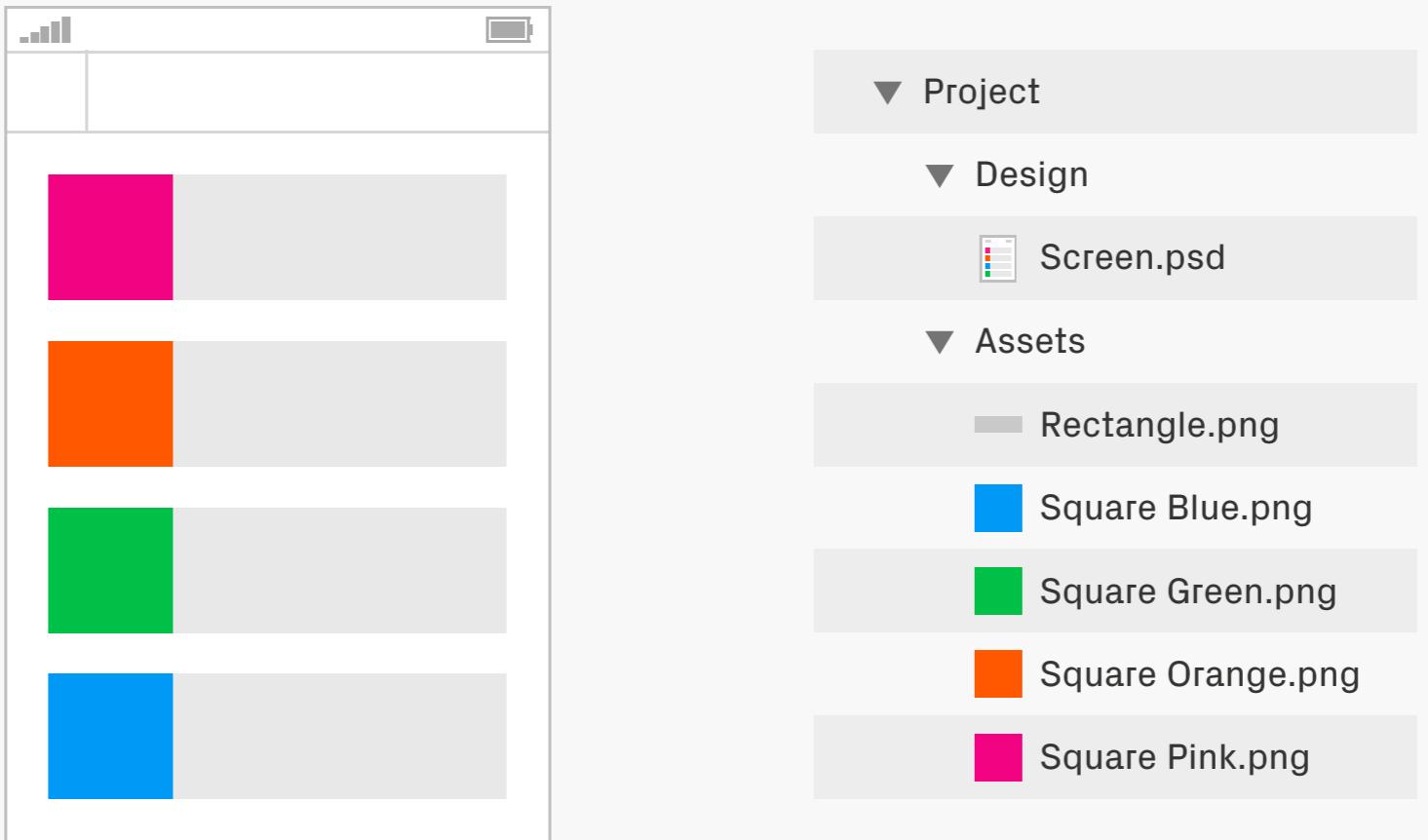
these days that will take a design from your computer and place it directly on your device, updating in real time as you apply changes. Make sure to use them!



# Prototyping

Closely linked to testing is prototyping, which is a quick way to try out ideas and designs without investing time and effort into polished versions. There are many forms this can take, from simple drawings on paper, right up to building limited apps in the platform's native

development environment. Pick whichever suits the feature you want to test; the basic structure of a screen can easily be tested on paper, whereas an animated transition may require something mocked up as a video or even coded.



# Organisation

No man is an island, and most of the time your files won't be either! Good organisation is essential as it saves a lot of time for other people on the project; well ordered files and layers mean other designers can jump straight into your work and find their way around, and a

logically named set of assets will make developers very happy.

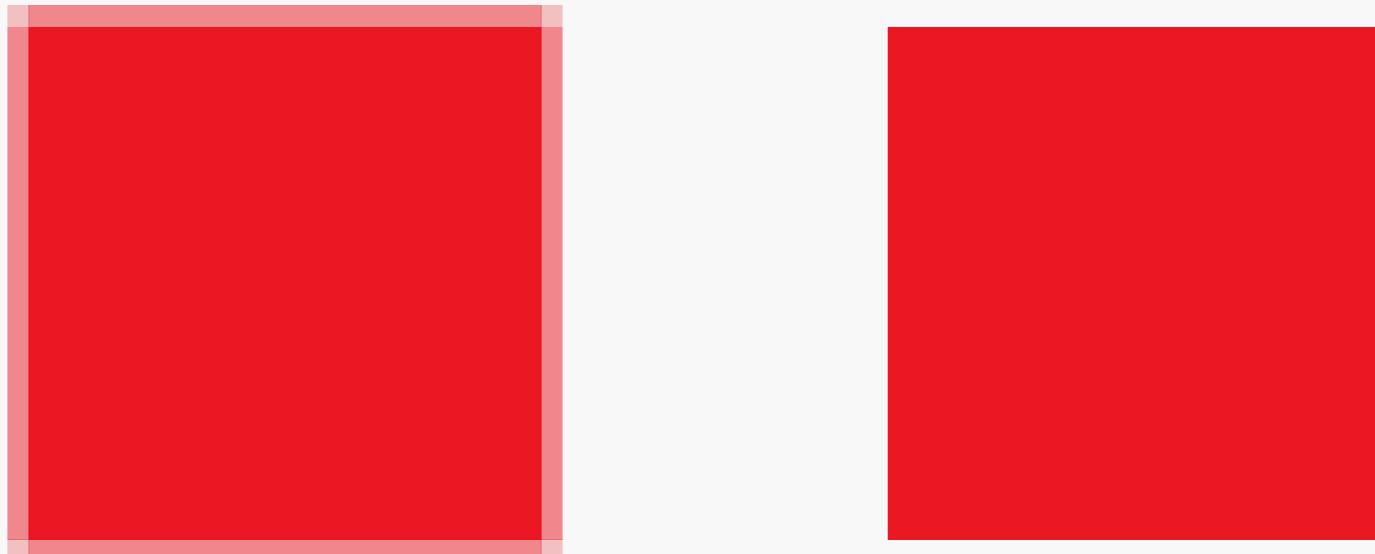
## Take a Break

It's very easy to get completely consumed in the design process, but sometimes it pays to take a break — not just for health reasons, but also the different perspective a refreshed set of eyes can bring. Go and make a brew, or wander somewhere else for a few minutes.

After coming back the solution to a design problem might be staring you right in the face, or you might spot a flaw that had previously gone unnoticed!



**PIXEL  
PERFECT  
DETAILS**

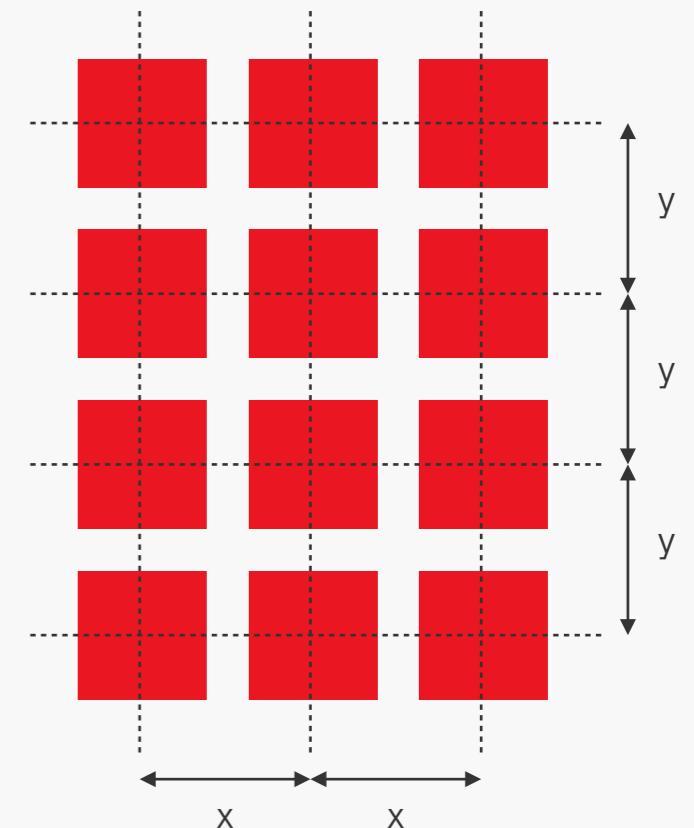
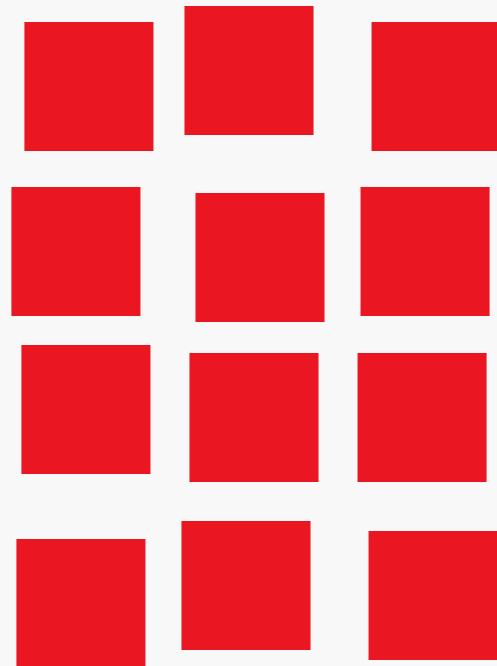


✗ Naughty

✓ Nice

## Sharp Edges

Straight edges should be on-pixel and sharp  
— blurred edges are a no-no!



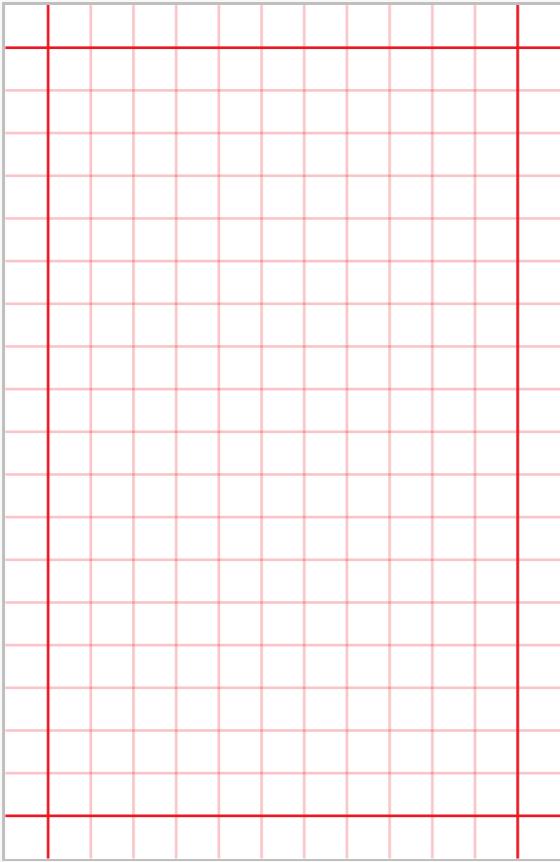
✗ Naughty

✓ Nice

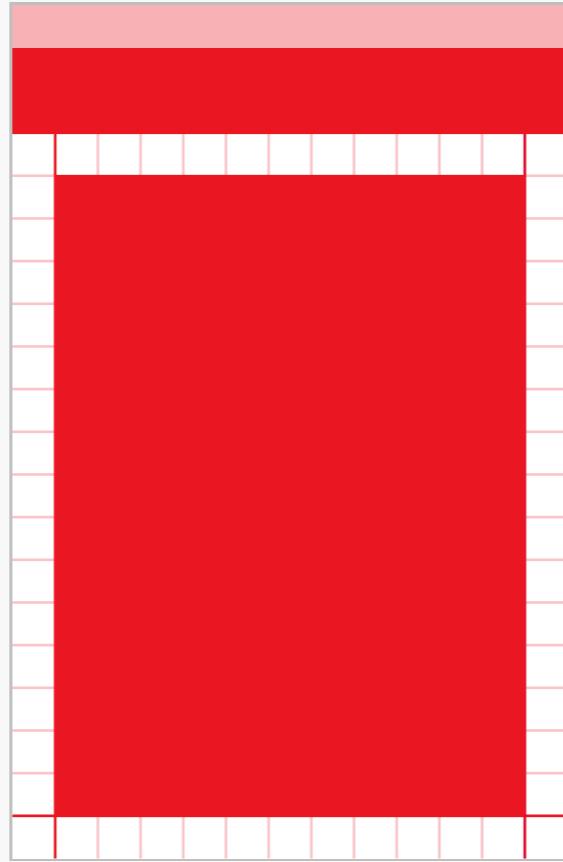
# Alignment and Spacing

Once you've mastered the art of getting everything sharp, the next step in your journey towards pixel perfection is making sure the alignment and spacing are right.

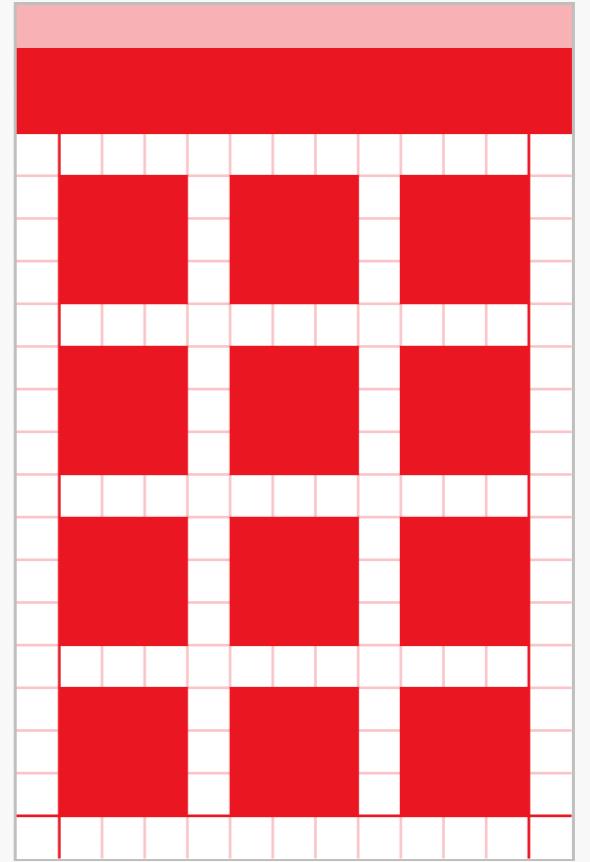
# Consistency

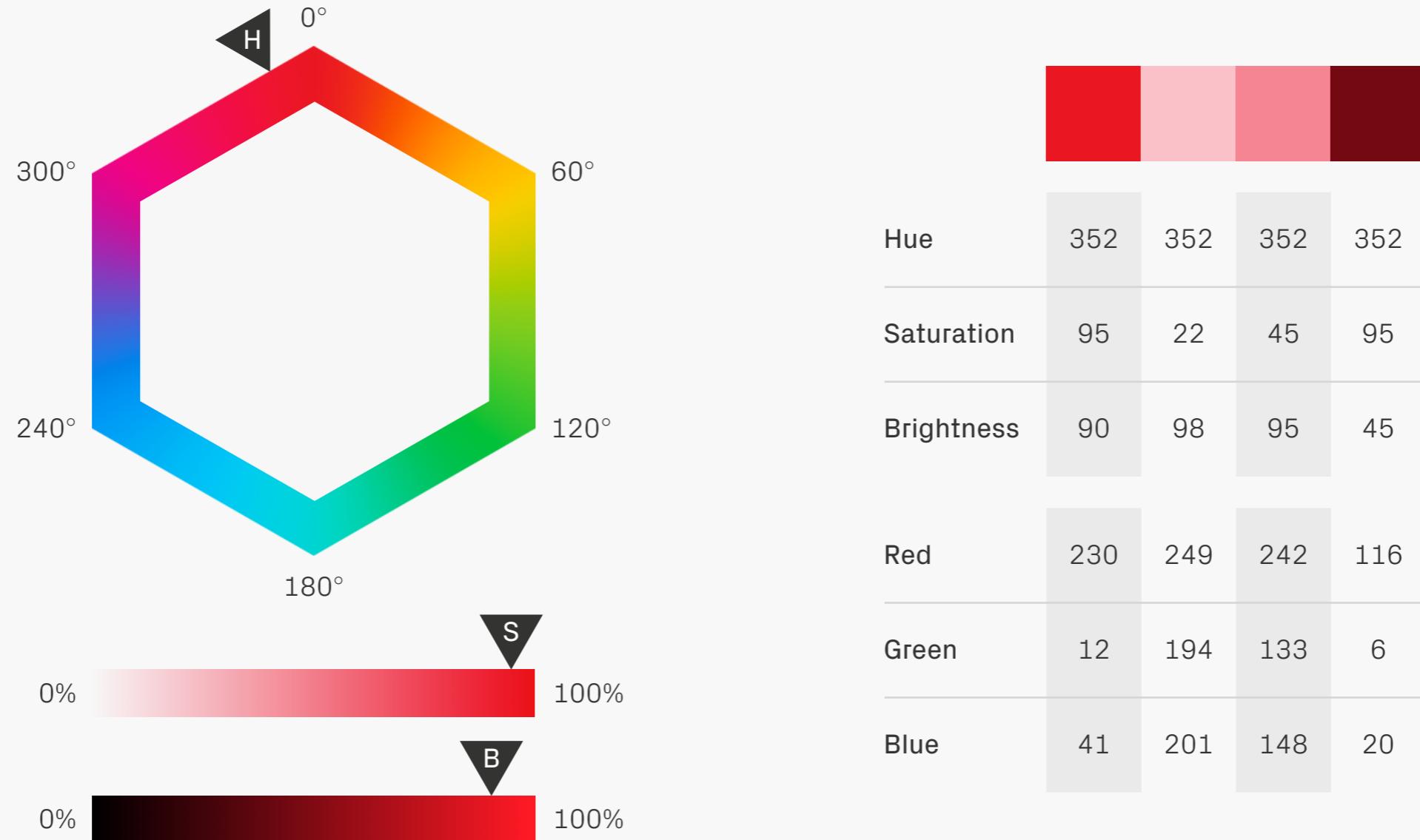


Alignment of objects across multiple screens is just as important. Margins and placement of common items such as title bars, back buttons, and footers should be the same throughout the interface to prevent objects jumping around. The best way of doing this is



to set up a grid, which will define a structure that can be followed throughout your screens.





## Colour Model

HSB FTW! Have a go at using HSB as a colour model when creating a palette — once it clicks you'll see it's a really efficient way to create different shades of a base colour. In the example above the Hue (*H*) value has been kept the same, then the Saturation (*S*) and

Brightness (*B*) adjusted to create the variations. See how much more sense the numbers make in HSB compared to RGB?

# Colour Management

Colour Profile

Code

Yes

No

✗ Naughty

✓ Nice

Colour management makes a lot of sense in print environments, but for digital often creates more problems than it solves. The main issue is a lack of availability throughout the development process — you can manage colours when creating assets, but when

they're mixed with unmanaged code (specifying the same original colours) there can be a mismatch. It's much better to ignore this procedure altogether, and instead test on the device — unlike print this takes a matter of seconds and costs nothing!

## Text Height and Width



Max. Height



Max. Width

These two tips are handy for creating designs based on dynamic text, such as translations or user-generated content. To find a line of text's maximum possible height use the Åy combo; similarly, if a text box needs to accommodate a minimum number of characters then fill that

limit with a series of capital Ws — if they fit then any other phrase will too.

# Settings

# Einstellungen

# Configurações

## Text Length

If you're working on a product that will be used internationally then consider how long the text content could be in other languages. The example above shows what happens with the German and Portuguese translations of *Settings* — an increase of up to 75% in length.



Cap Height and Descender

x-height

Cap Height and x-height

## Aligning Text on Buttons

Shown above are three ways to vertically align text on buttons. Which method is best depends on a few variables, such as the choice of typeface (for example the cap height to x-height ratio can vary) and whether you're using uppercase, lowercase, numbers, or a

mixture of all three. Make sure that once you pick a rule you stick to it throughout the interface — consistency is king!

# Aligning Text with Objects

■ Align Text



■ Align Text

✗ Naughty

Try to vertically centre text to an object using the x-height, rather than the cap height, as it gives a better optical alignment. In the Naughty example above you can see that the main visual weight of the typeface, located in the x-height area, sits lower than the square.

■ Align Text



■ Align Text

✓ Nice

The exception to this rule is text fixed to all caps or numbers — these can be aligned by cap height as they won't feature descenders.

# Object States

Active

Selected

Disabled

Remember that interactive elements will likely need some extra states in addition to the default one you provide in a mockup. These can vary depending on the platform and input method, but in any case try mocking them up while creating your design rather than leaving

them as an afterthought — that way you can make sure their styling fits in with the rest of the design and works on an interaction level.



Outer = Inner

Inner Scaled

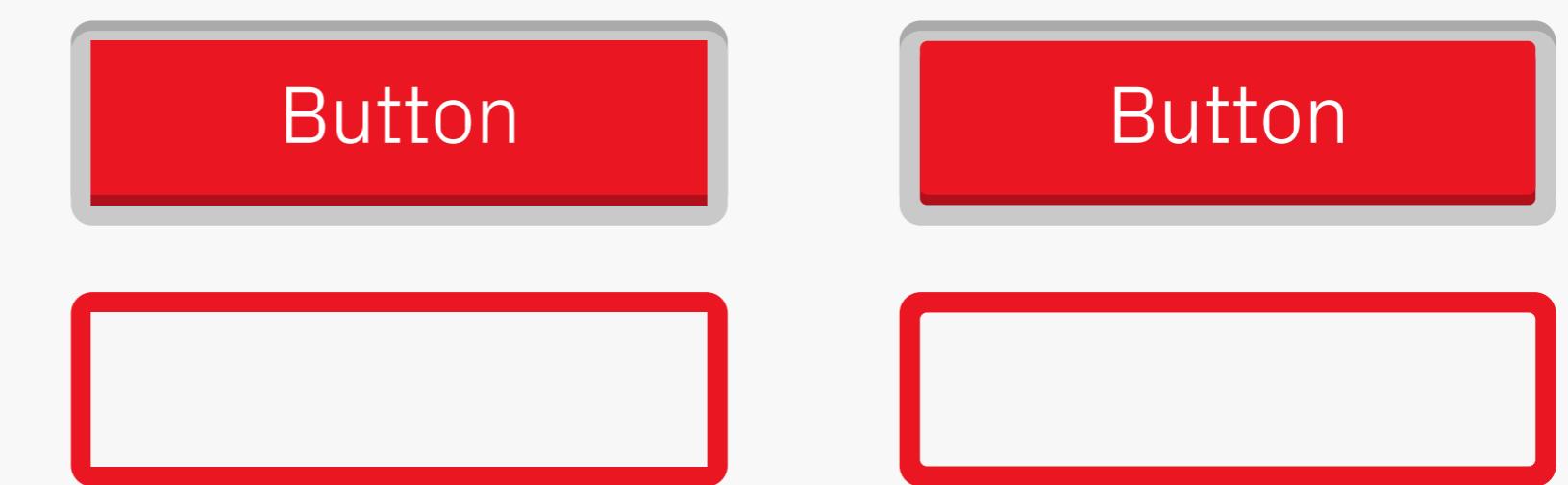
Outer = Inner + Border Width

## Borders and Corner Radii

Interface components often need some kind of border, the straight edges are easy enough to do, but what's the best way to work out the outer corner radii based on the inner? There are a few methods available, the most common being shown above — matching the

inner and the outer radii, scaling the original shape in size, and adding the border and original inner radius together. The latter is by far the best method, resulting in consistent outlines that don't thicken at the corners like the other two.

# Borders and Corner Radii Filletting

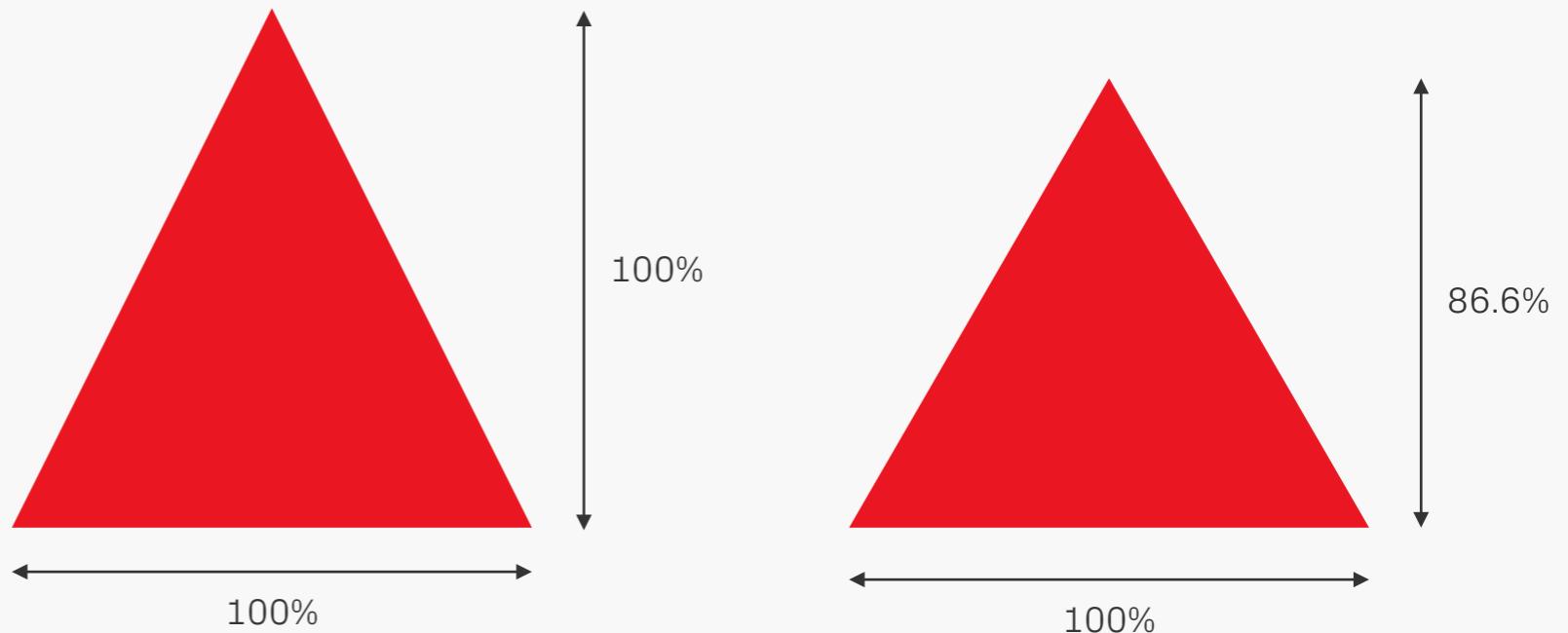


Inner = Outer – Border Width

Filletted

If you use the preferred method from the previous page, but reverse the process by starting from the outer radii, you could end up with corners on the inner shape that are completely square. In these situations consider adding a small radius back in, though

mathematically “incorrect” it may look better from a visual perspective. In the engineering world this process is known as filleting, with each individual corner called a fillet. Check out Ra Design’s [in-depth article on borders and corner radii](#) to learn more about this subject.

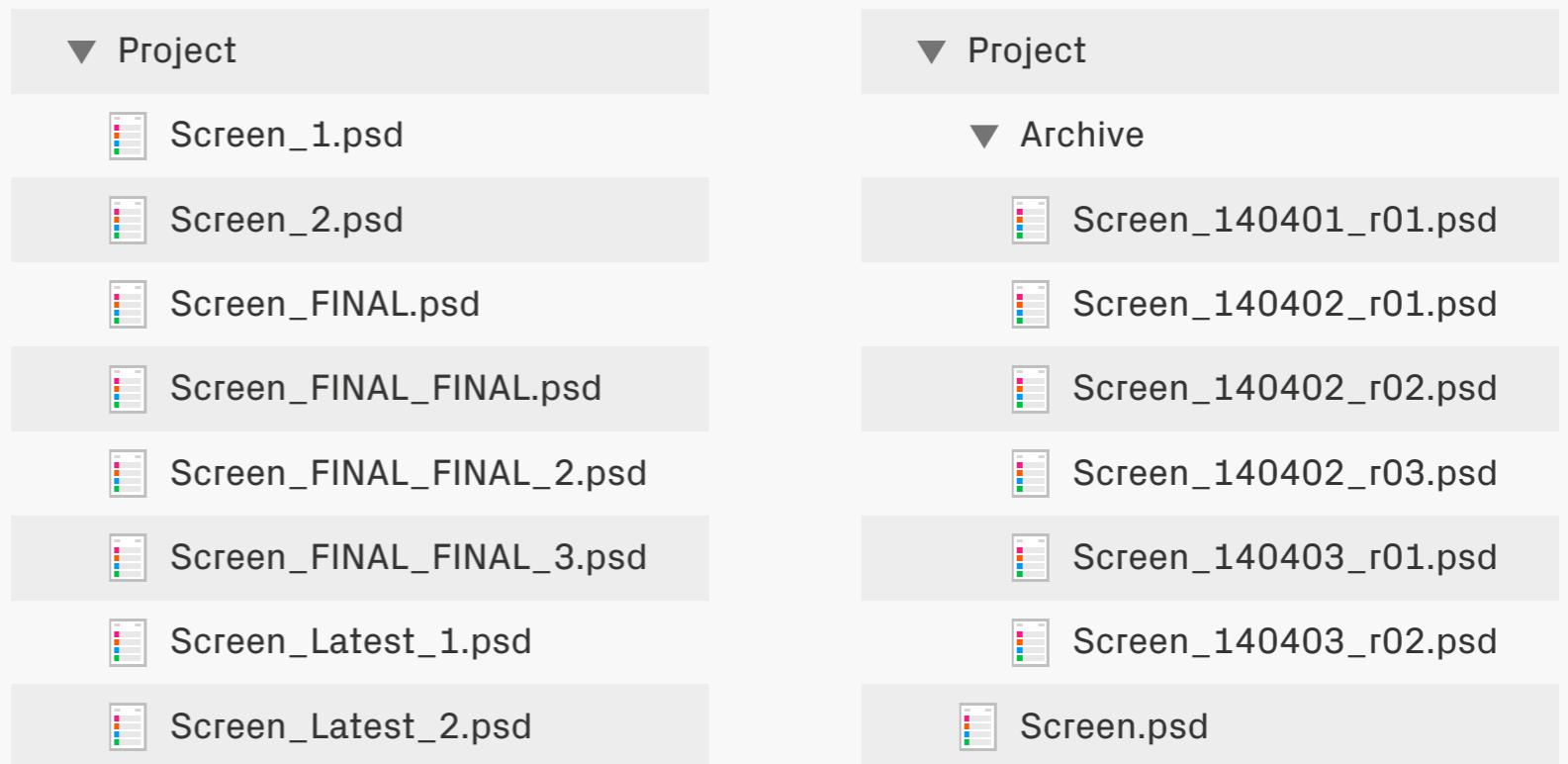


✗ Naughty

✓ Nice

# Equilateral Triangles

Some graphics applications draw triangle shapes that aren't equilateral by default, but instead use the same measurements for both x and y dimensions. To quickly convert to an equilateral scale the height (with the shortest edge at the bottom) by 86.6%.



**✗ Naughty**

## Version Control

Although there are now a multitude of version control applications available for designers, more often than not we still end up managing files and revisions ourselves. Doing this manually is more time consuming, but using a system like the one shown above will help. The

most recent file, *Screen.psd*, is kept at the top level of the working folder. At the start of the day and other key moments, that file will be duplicated, placed in the *Archive* folder, and given a filename based on the date (YYMMDD works best) and revision number. Tidy!

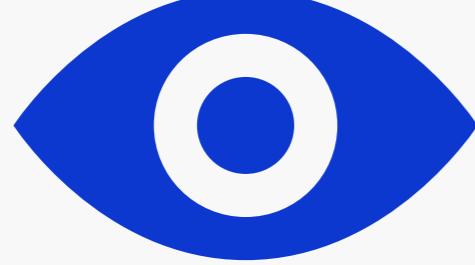
# **ACCESSIBILITY**

# *“If I make my design accessible, won’t it look rubbish?*

## Accessibility

Accessibility doesn't mean compromise for those with disabilities, but instead good, inclusive design for everyone. There's no need for huge sacrifices in terms of visual appeal, or dramatic amounts of extra time and money to make everything comply to standards. Like

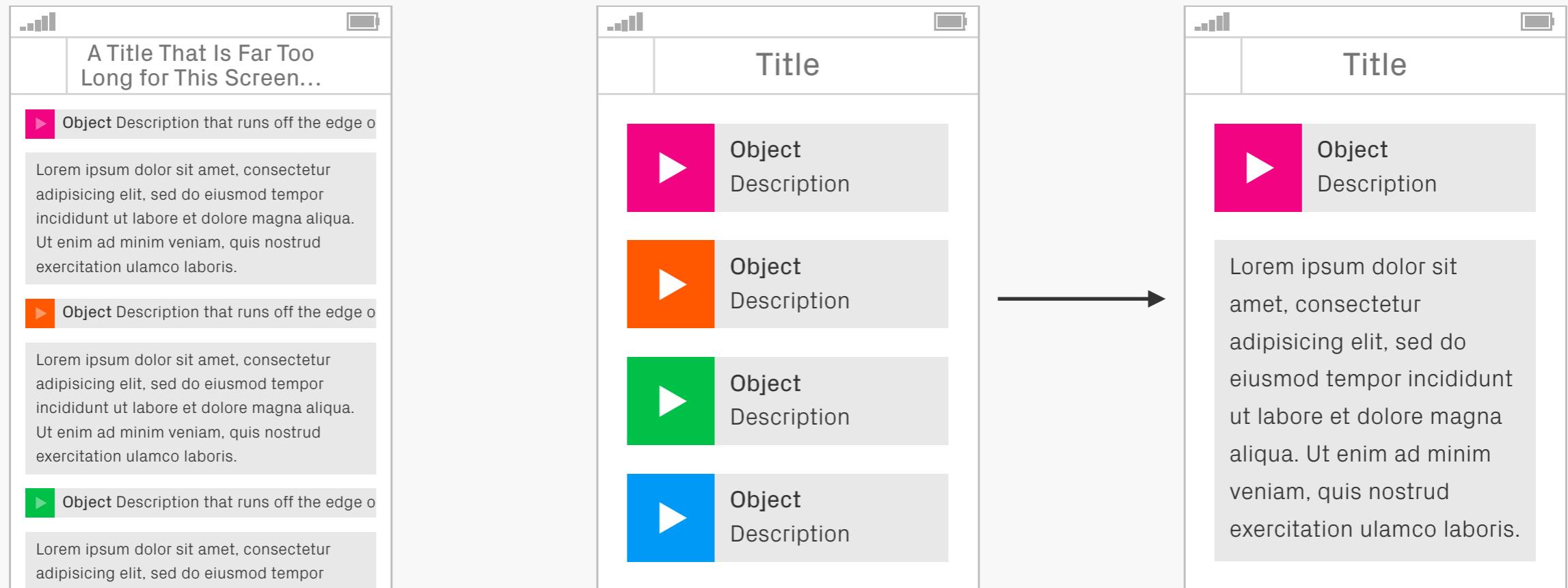
pixel perfect precision, if these principles are built into your design process from the start, then you'll find that making your product accessible takes very little time at all.



# Types of Impairment

Around 10% of the UK population have some form of disability, which is a significant number of potential users. There are four main types of impairment that will commonly affect digital projects: sight, hearing, touch and cognitive i.e. the ability to process those other

three senses. Don't rely on one sense alone to make your product or feature usable, but instead allow multiple forms of interaction and communication where possible — for example enabling text-to-speech functions for visually impaired users.



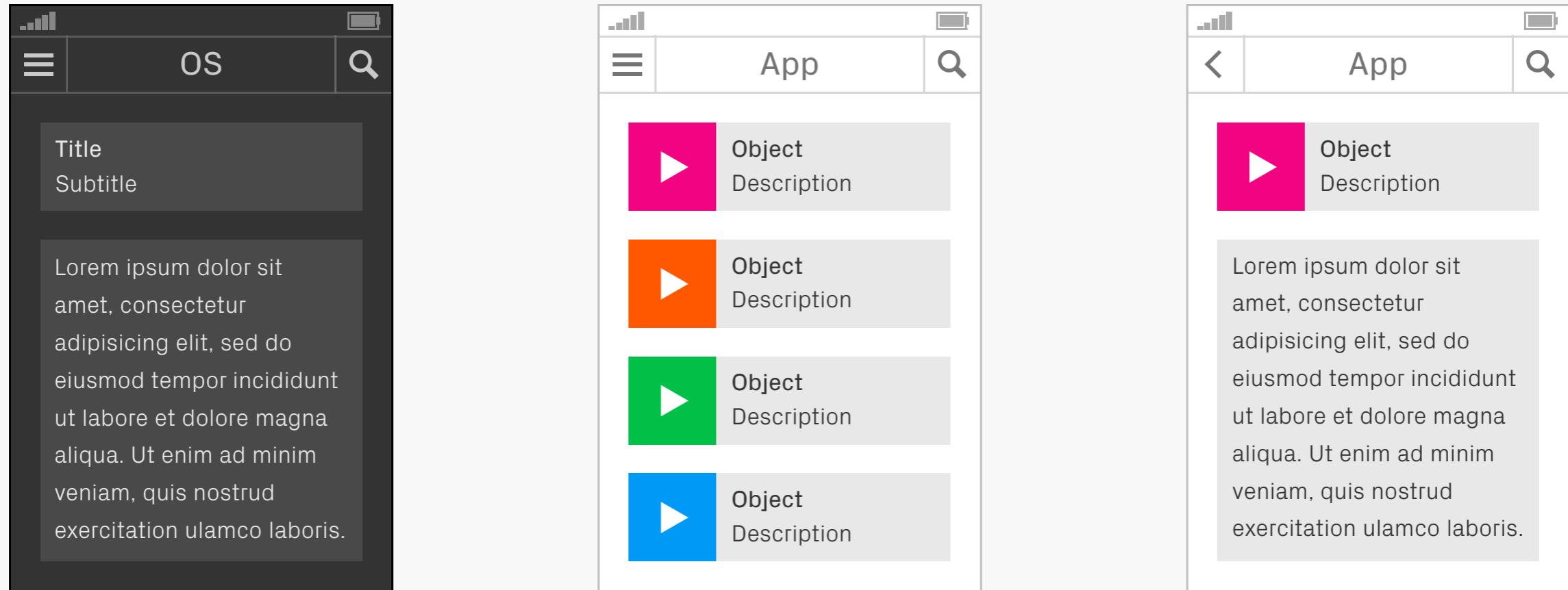
**✗ Naughty**

**Clarity**

Keep designs as clear and concise as possible to avoid overloading the user with too much content. You can do this by showing information which is relevant to the context of the user, and then utilising progressive disclosure to reveal more details as they are

**✓ Nice**

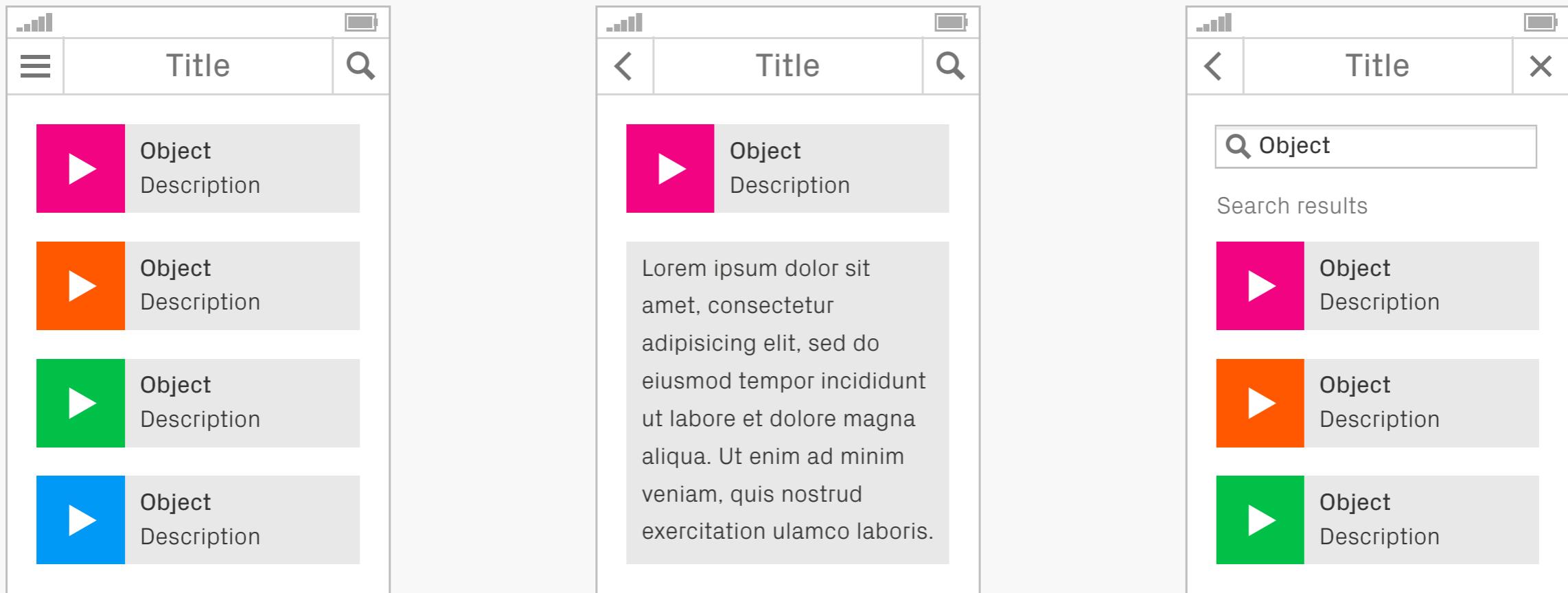
needed. It's also important to make your content suitable for mobile devices — for example keeping image sizes small for those on data connections.



# Consistency

Your designs should maintain consistency across a number of levels, including style, navigation, typography, and use of language. Interface elements should act in a standard way whenever they appear, and where possible follow any conventions or patterns

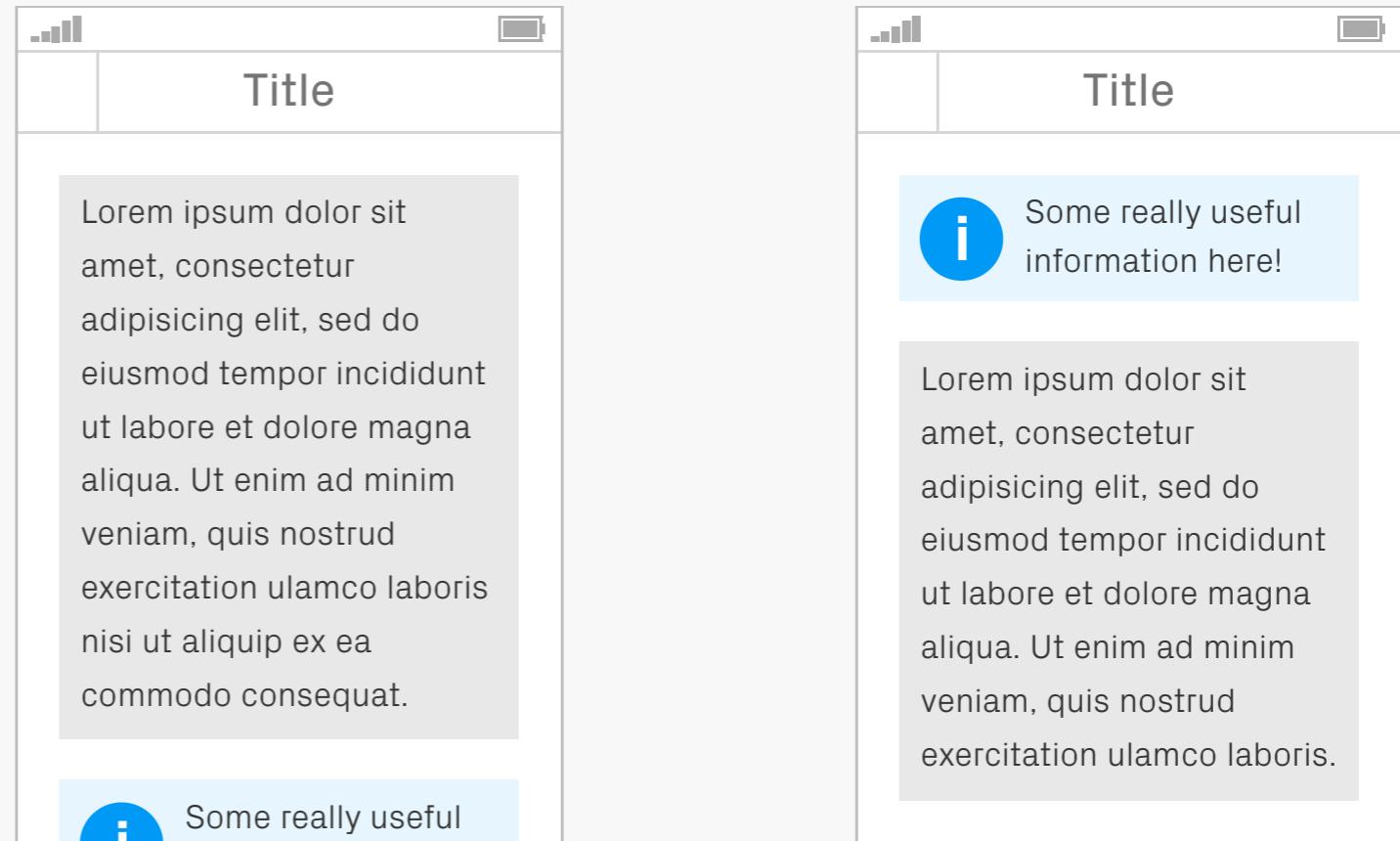
from the host operating system — this means that users can predict how the product will behave, based on past experiences with the platform. Most major devices have guidelines for their design and interaction patterns — so check those out.



# Navigation

As mentioned on the previous page, navigation should behave consistently as it will help users move around your app without feeling lost. Position navigational elements in the same places across all screens, with the same styles and labels. This also applies to

other parts of the interface, for example, if a button performs a certain action in one part of the app, then it should do the same when activated elsewhere.

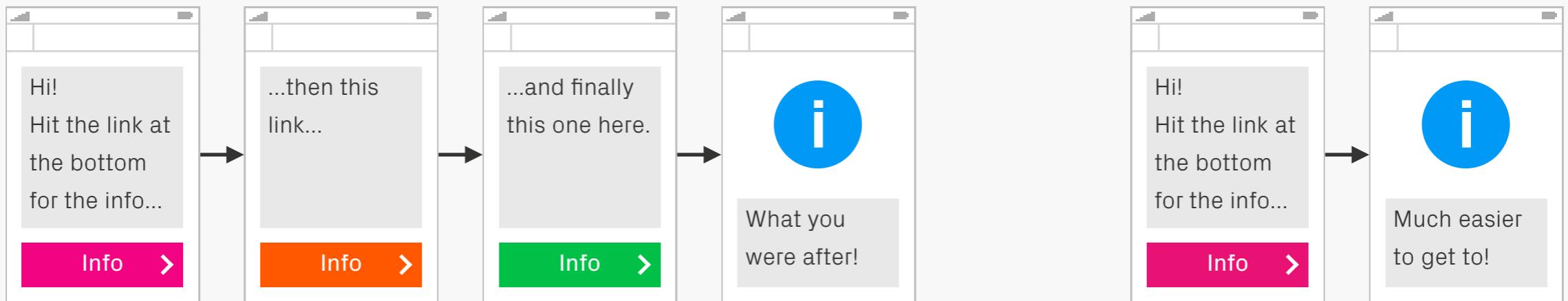


✗ Naughty

✓ Nice

# Navigation Content Structure

When creating the layout for a page, really think about why the user is there and what they're looking for. Based on that, structure your content in such a way that the most important parts are the easiest to reach.

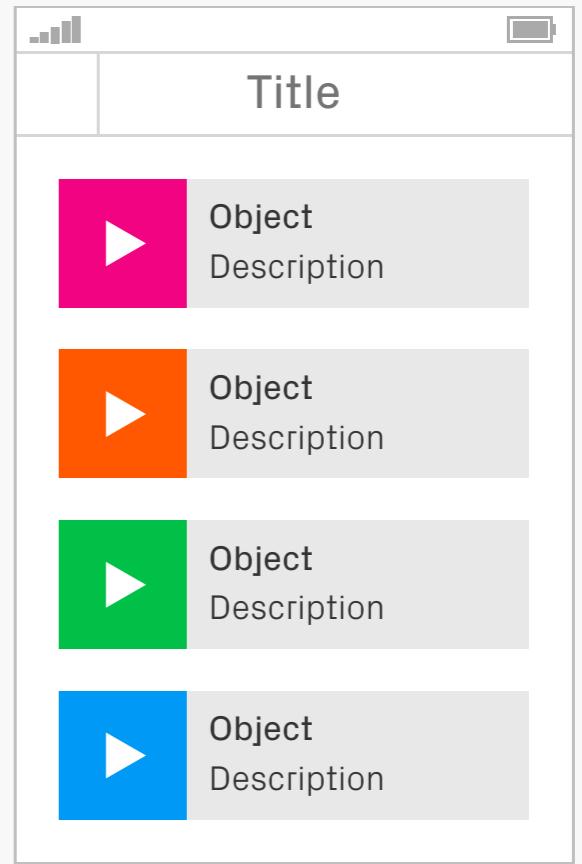
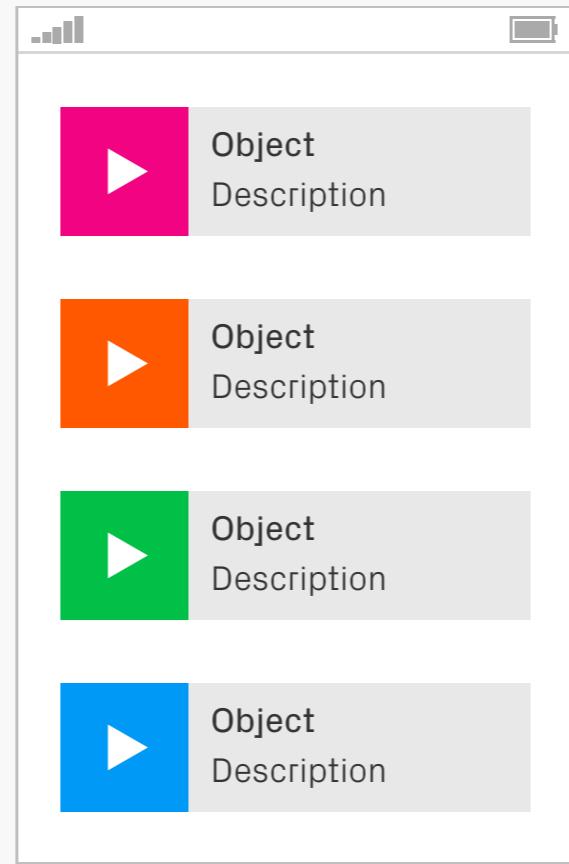


✗ Naughty

✓ Nice

## Navigation Minimise Steps

Although cramming everything on to one screen isn't a great idea, be mindful that by introducing too many steps you can create hassle for your users. Try to make all information accessible within four pages — any more can cause frustration.

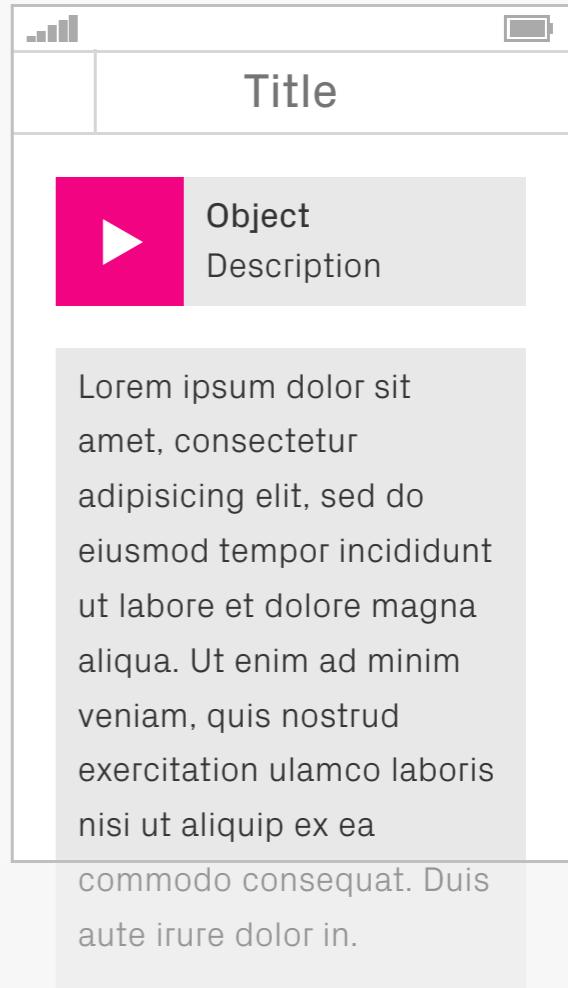
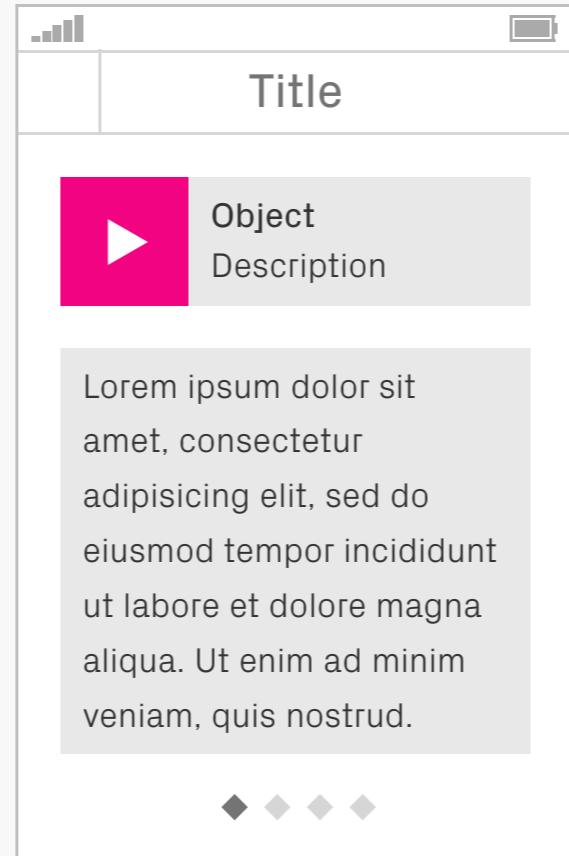


✗ Naughty

✓ Nice

# Navigation Titles

Clearly title pages so that users know where they are, as well as the context of the information presented to them.



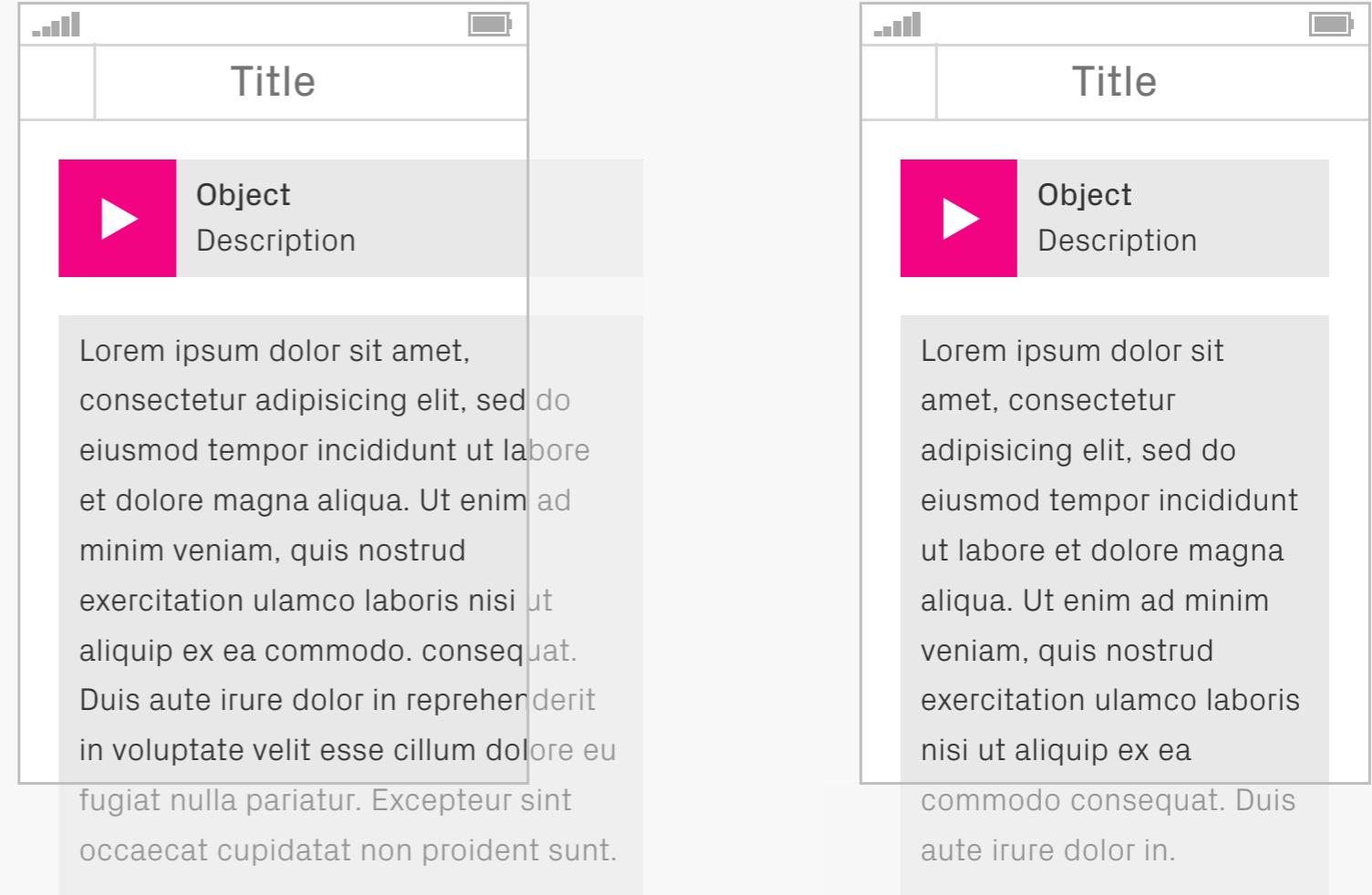
✗ Naughty

# Navigation Appropriate Page Sizes

Keep your content to an appropriate page size and try to introduce breaks where it makes sense. Scrolling through a page is much easier than linking between them, it also reduces the amount of page requests which will be beneficial to mobile users. Don't make the

pages too long though, as no one likes to endlessly flick up!

✓ Nice



✗ Naughty

✓ Nice

# Navigation

## Limit Scrolling to One Direction

Make sure your content only scrolls in one direction — it's easier both physically and mentally for users, as they won't have to pan around trying to keep track of what they have and haven't seen.

# Navigation

## Numbered Lists

- Pink
  - Orange
  - Green
  - Blue
1. Pink  
2. Orange  
3. Green  
4. Blue

 Naughty

 Nice

If you've got more than three or four points in a list, consider using numbers instead of bullets as these provide some structure, which aids navigation through the content.

# Navigation Labelling



“ This is a button that initiates Action. By pressing it you will proceed to the next screen of the app.



“ Go to next screen

Naughty

Nice

Creating labels for text-to-speech functions is an art form in itself. Make descriptions clear, so that users know what's going on, but also concise so they don't have to spend ages listening to them.

# Navigation

## Labels Above Input Fields

<input type="text" value="Gyppsy"/>	Name
<input type="text" value="Enter email address"/>	Email

“ Gyppy. Enter email address.

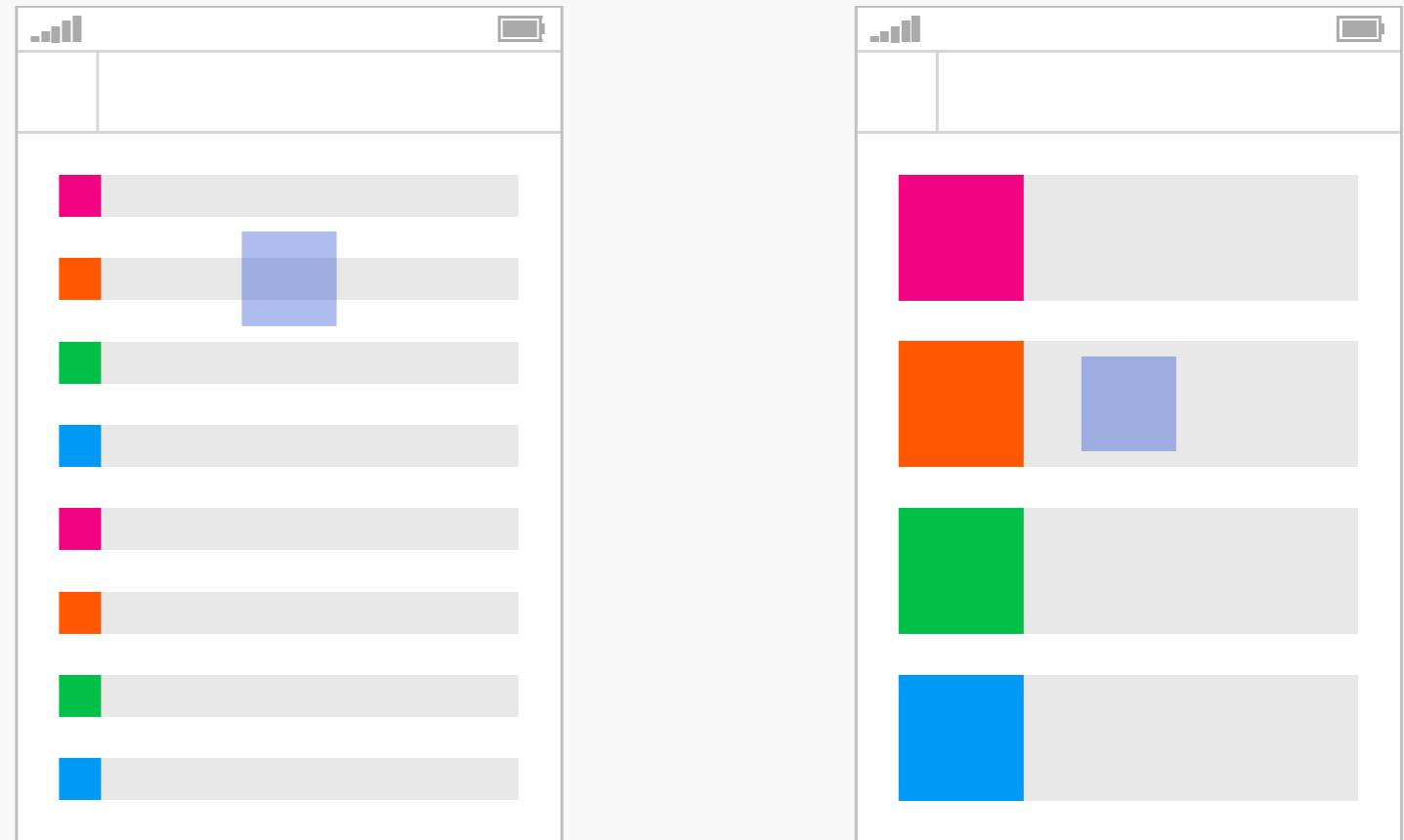
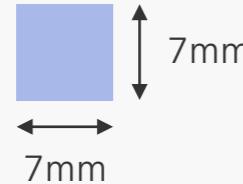
“ Name Gyppy. Email Enter here.

 Naughty

 Nice

Place labels above input fields rather than in them, as once there's an entry in the latter, a screen reader won't make as much sense to the user — it will only output the value entered, not the field name.

# Interaction Touch Targets



✗ Naughty

When creating designs for touch-based devices, always consider how easy they are to operate using fingers and thumbs. We usually base our designs on a minimum touch area of 7mm x 7mm, which is the rough size of the contact area between a finger and screen, and

✓ Nice

then leave at least a 2mm gap between items so they don't get pressed accidentally. If you've got components that will be primarily thumb-operated, then make those wider, as the average width of an adult thumb is 25mm.

# Interaction

## Buttons and Hyperlinks

Action

Action

✗ Naughty

✓ Nice

Buttons are the commonly accepted method of initiating actions in applications, so opting for hyperlinks instead will confuse the user.

# Interaction

## Buttons and

## Hyperlinks

This is not  
a link

This is not  
a link

 Naughty

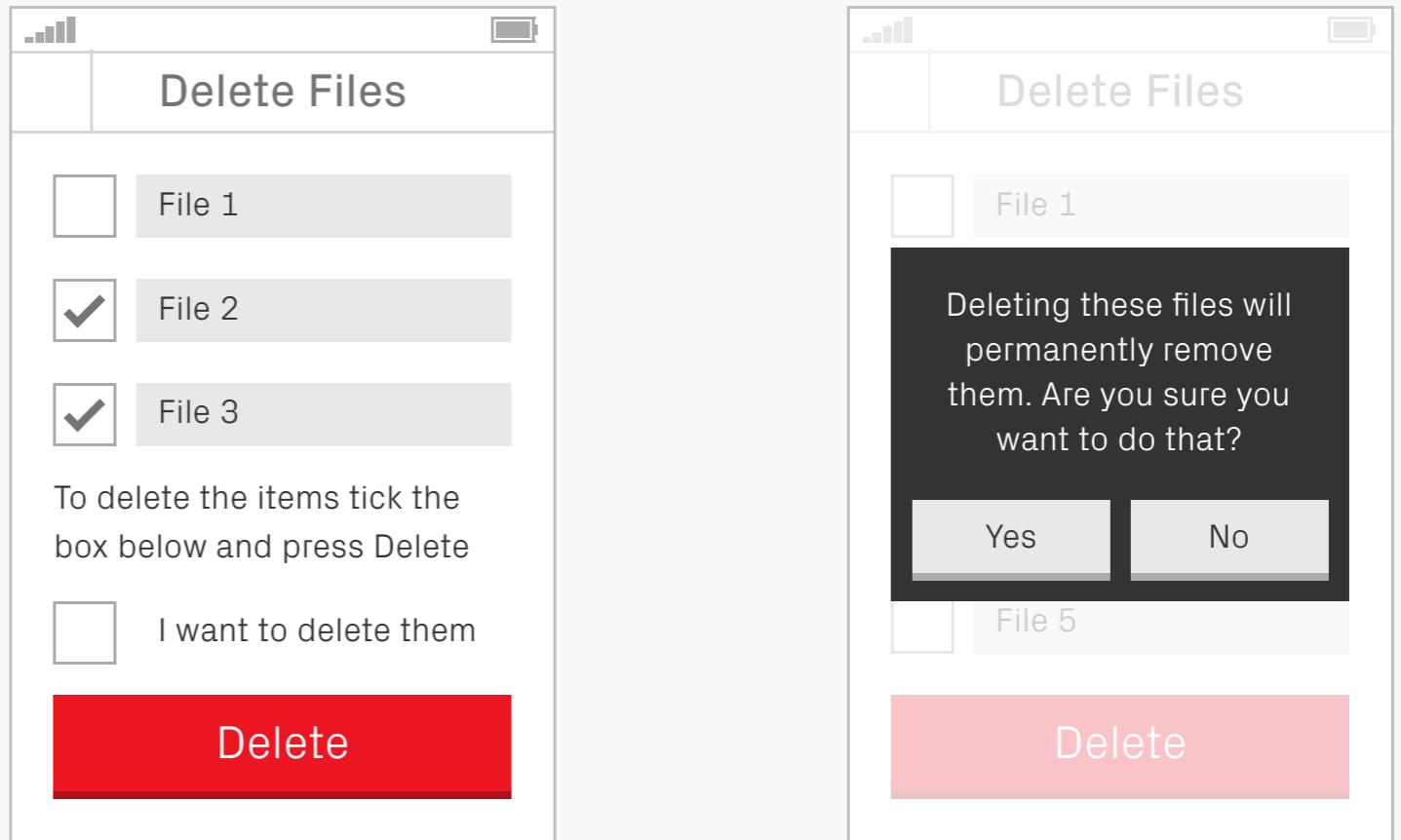
 Nice

And talking of hyperlinks, don't underline text that isn't a link, as again this can cause confusion. Users may think something is wrong when they tap it and nothing happens.

# Error Prevention Design

It's well worth trying to minimise errors that can occur while using your product. One of the best ways to do that is through design. There are various techniques available, such as placing useful elements at the fore and isolating or hiding those that can be risky;

using warnings and confirmations as methods to prevent errors; and providing fail-safes should anything go wrong. Also, try to make users think about what they're doing in important situations, rather than allowing them to cruise through on autopilot.



# Error Prevention Checked Data

Name

Gyppsy

Telephone

01234 56789

Submit

Name

Gyppsy



Telephone

01234 56789



Invalid number

Submit

✗ Naughty

✓ Nice

It's sometimes difficult to input data on mobile devices due to their small size, so giving users an indication that what they're entering is correct can be really useful.

# Error Prevention

## Free Text

Colour

Enter colour

Colour

Select colour ▼

Pink

Orange

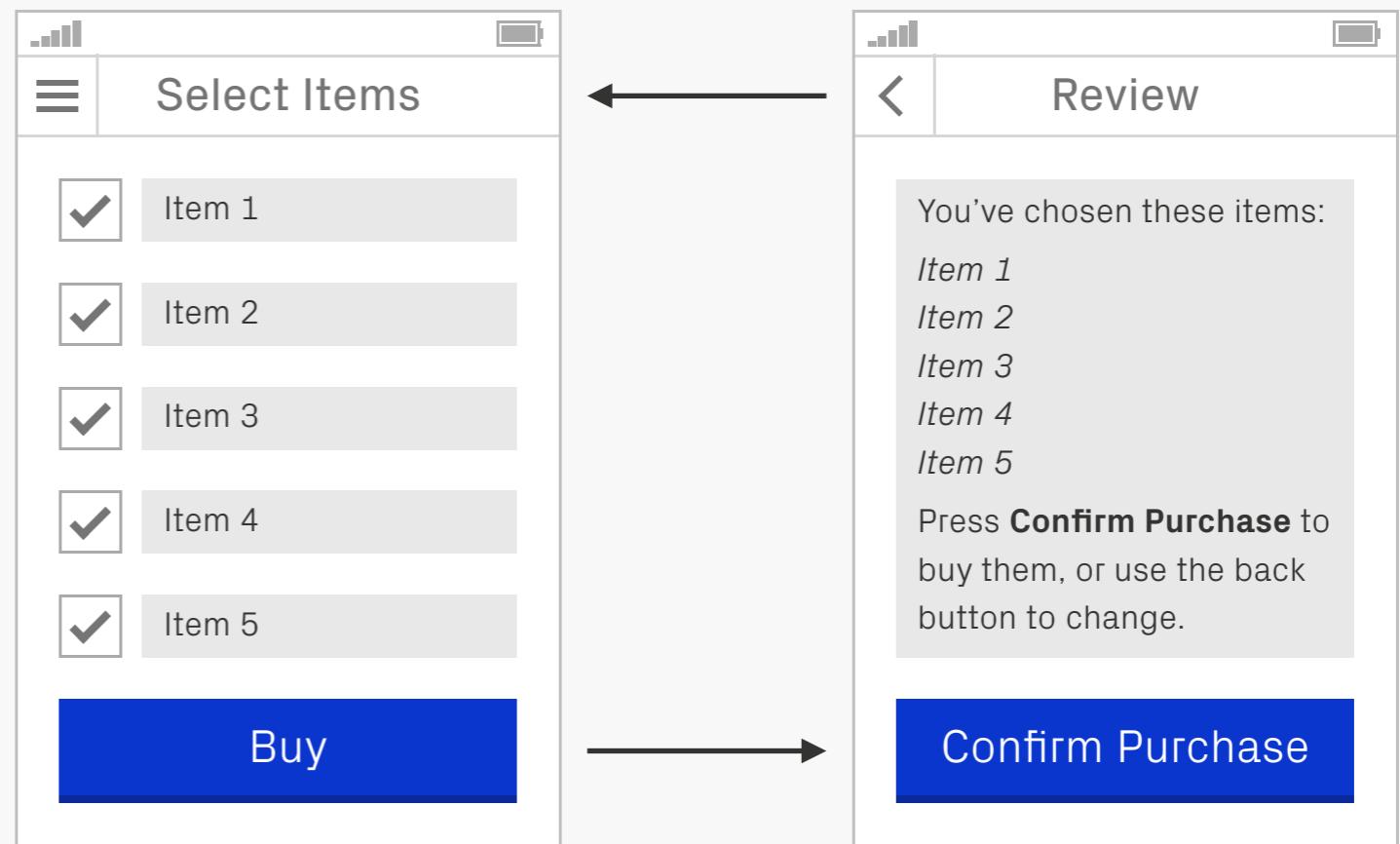
Green

Blue

✗ Naughty

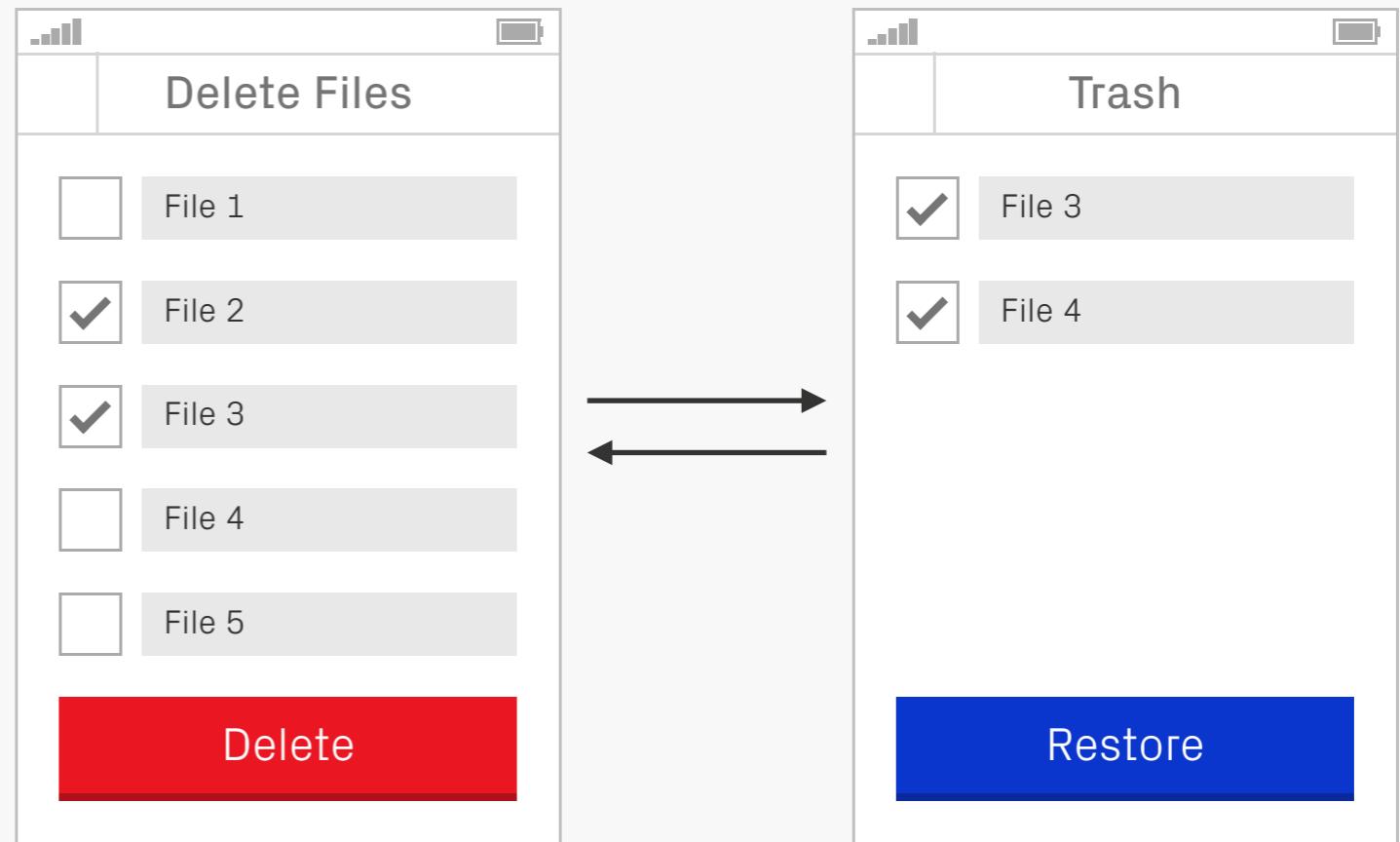
✓ Nice

Where possible provide default values rather than free text entry, as it will reduce the chance of input errors.



# Error Prevention Review, Confirm, and Correct

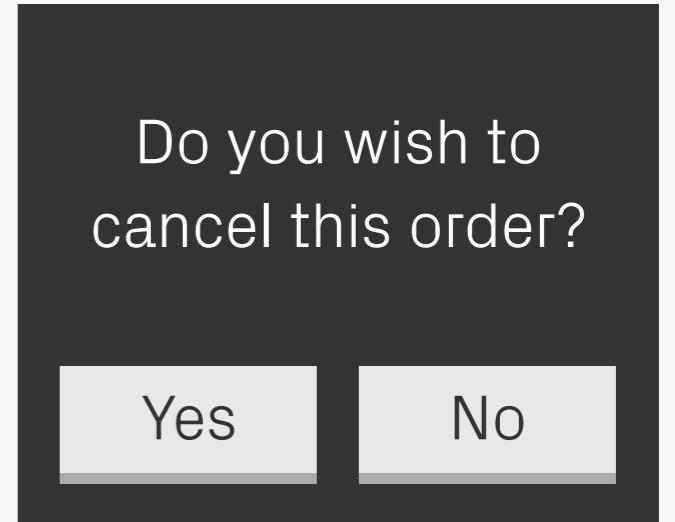
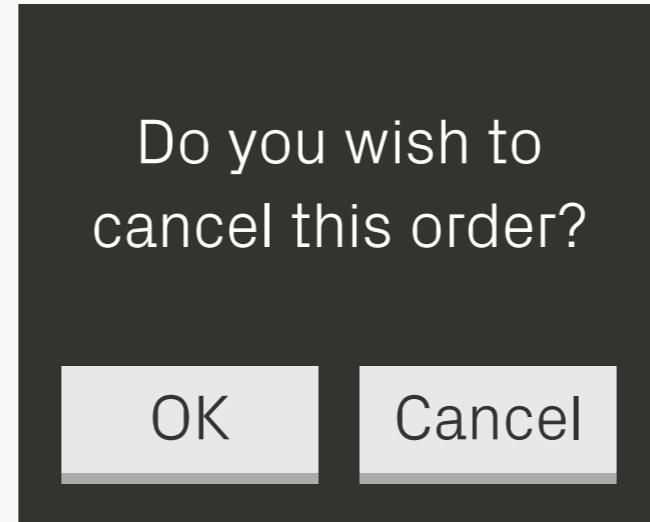
When users are entering data as part of a process, give them an opportunity to review it before submitting, as well as the option to go back and correct if necessary.



# Error Prevention Reversible Submissions

If your app allows people to carry out hazardous procedures, such as deleting their content, then provide some way of undoing that process if needed. This might be in the form of a trash folder that only gets emptied once a week, or some kind of version control

which allows users to step back in time to a previous revision.



✗ Naughty

## Copy

It's not just how your type looks but what it says that's equally, if not more important. Unclear labelling or instructions confuse users, so spend time thinking about what you're trying to communicate and if it's being done effectively. In this Naughty example

✓ Nice

would you select Cancel to cancel the order, or does it cancel the cancel?

# Copy Break Up Large Blocks of Text

**LOREM IPSUM**

Consectetur  
adipisicing elit, sed do eiusmod tempor  
incididunt ut labore et dolore magna aliqua.

Ut enim ad minim veniam, quis nostrud  
exercitation ulamco laboris nisi ut aliquip  
ex ea commodo consequat.

Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.



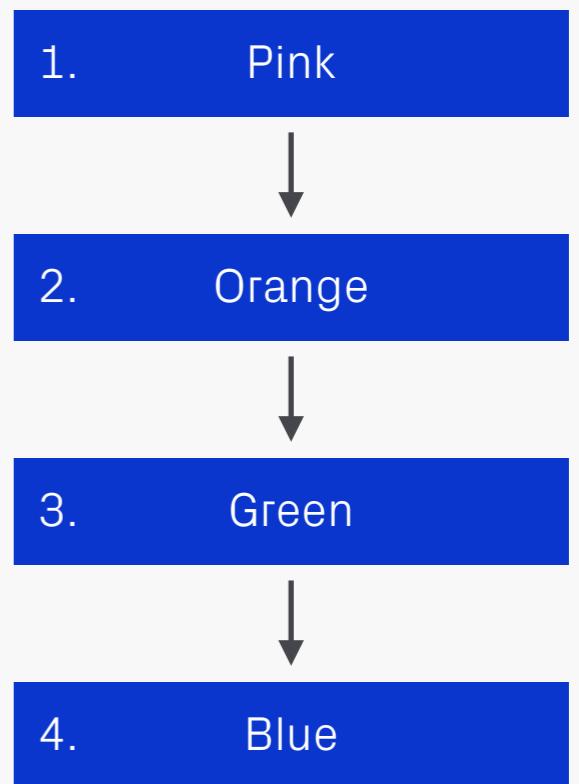
Break up large blocks of text so they're easier to digest and keep track of. Use around 5 lines as a maximum and you'll not go far wrong.

1. Pink — Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce pellentesque vehicula elit sed tincidunt. Nam bibendum tempus tellus ac interdum.

2. Orange — Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed fermentum sodales orci. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos.

3. Green — Pellentesque a nibh nibh, vel dictum risus.

4. Blue — Nunc congue vestibulum nibh non sollicitudin. Donec eget metus leo.



✗ Naughty

✓ Nice

## Copy Text to Diagrams

Some users, such as dyslexics, can have poor organisational skills, so consider breaking down long paragraphs of text into lists or diagrams, which help them by showing the information in smaller, ordered chunks.

# PPP (Pixel Perfect Precision)

## Copy Abbreviations

 Naughty

 Nice

If you're using abbreviations make sure to include their expansion on first use. Better still try to avoid them altogether, as remembering what they stand for can prove difficult for some users.

## Copy Link Text

Click here

 Naughty

“Click here” works well enough as a link, right? Wrong! Not only does it contain zero information on where the link leads to, but also most touchscreen users won’t even have a mouse to “click” with. Since it’s a form of navigation, the text should instead clearly

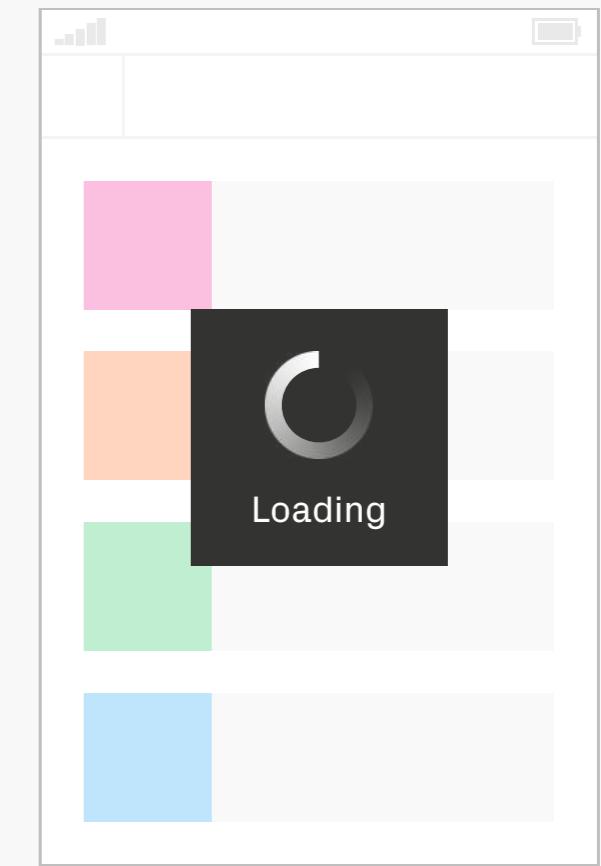
 Nice

describe its destination, as well as make sense in isolation. Users will often scan a page and pick out links which might lead them to the content they’re after. Also include any other relevant details that might be useful, such as the download size if it points to a file.

Pixel Perfect  
Precision  
Handbook  
(25MB)

# Feedback

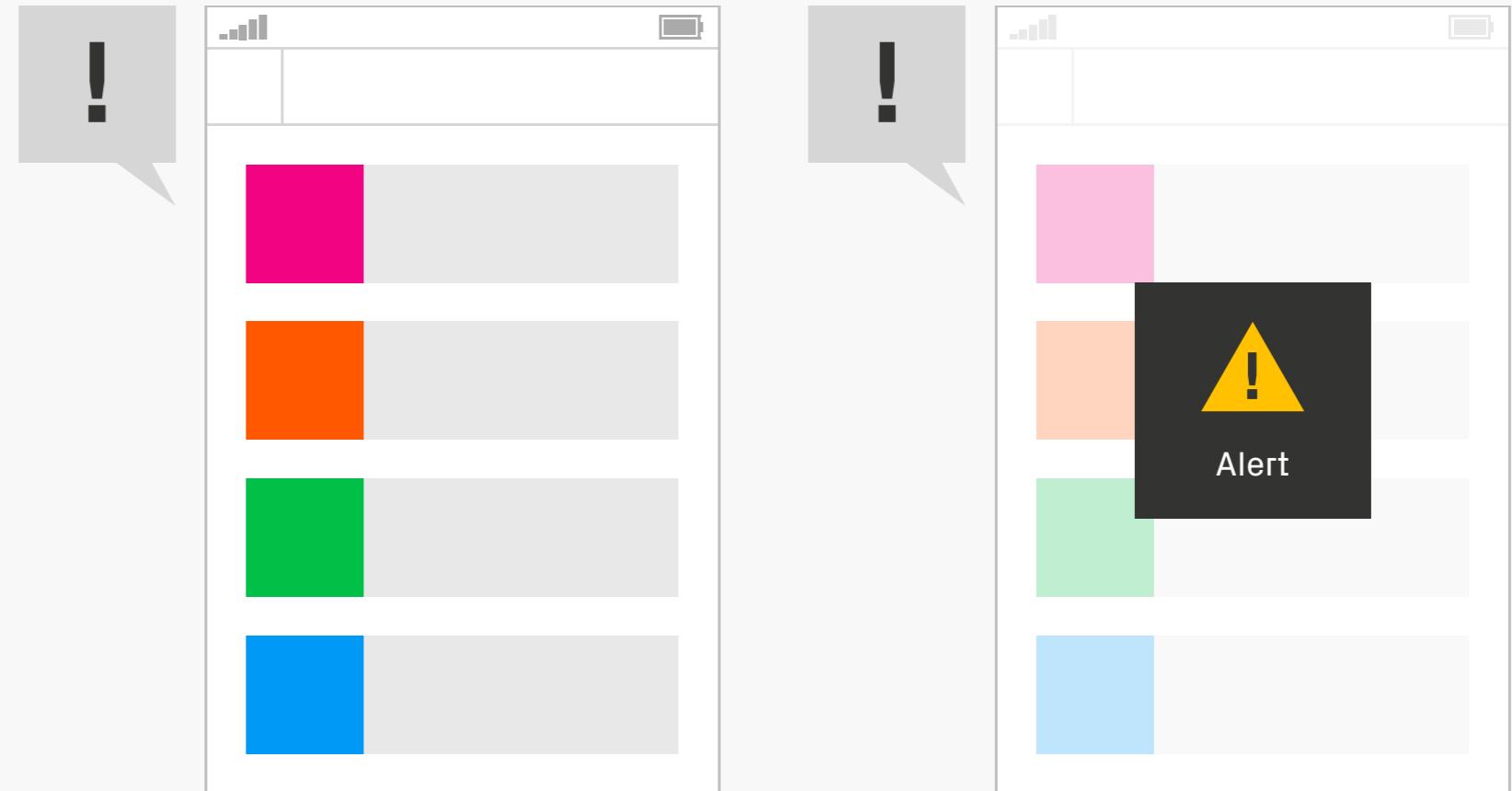
Give users some feedback when they're performing tasks so they feel reassured. There's nothing more annoying than wondering if an app's frozen when it pauses to process a request, or pressing buttons that don't seem to do anything. Feedback in these



✓ Nice

✗ Naughty

situations could be in the form of spinners and messages that notify users of what's happening, or pressed states and sounds to reinforce that they've initiated an action.



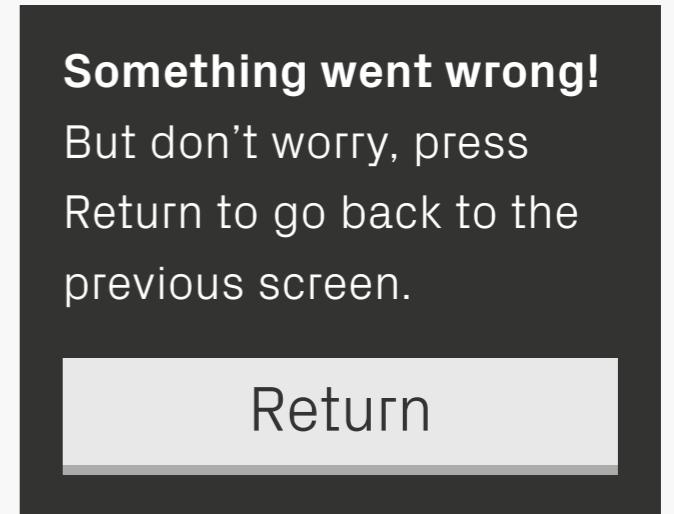
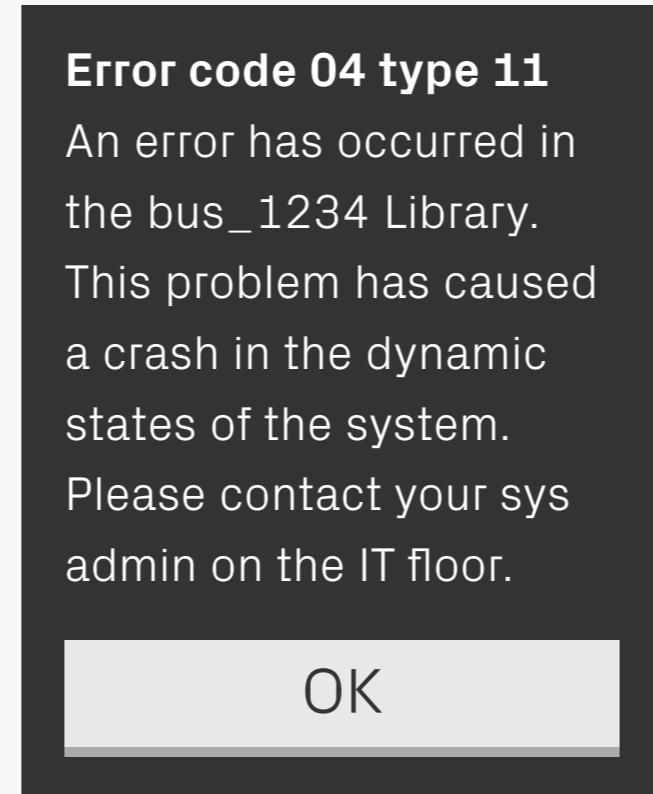
✗ Naughty

✓ Nice

## Feedback Multi-sensory

Provide feedback in multiple forms where possible. For example, relying solely on sound for an alert would mean that deaf users, or those located in noisy environments, wouldn't be aware that something has happened which requires their attention.

# Feedback Error Messages



✗ Naughty

✓ Nice

If something goes wrong let the user know what's happened in an understandable way, and provide them with the option to navigate back to somewhere useful.

**!** You work at ustwo

Name

Gyppsy

Name

Gyppsy

Company

usthree

Company

usthree



You work at ustwo

**✗** Naughty

**✓** Nice

## Feedback Error Proximity

When designing forms, place error messages next to the relevant field rather than far away, as this will help users identify the problem more quickly.

# Typography

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 Naughty

As mentioned in Pixel Perfect Principles, good typography is vital in digital design, and has a great effect on your product's accessibility. The basics of good line length and leading are just as relevant for this medium, especially for those with visual or cognitive impairments. By

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 Nice

keeping text light and legible you'll help these users navigate easily from one line to the next.

# Typography

## Font Size

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 Naughty

 Nice

The minimum font size you should be using is 12pt, with a good reading size around 16pt (1em). Make text too small and users will be straining to see what it says, especially on lower density screens which aren't that sharp.

# Typography

## Line Length

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 **Naughty**

Keep line lengths below 80 characters wide. If any longer a user will find it difficult to gauge where the start and end points of each line are, making text harder to read. A good range to aim for is 45–75 characters, with the optimum length being 66 including spaces (as

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 **Nice**

discussed in Robert Bringhurst's [The Elements of Typographic Style](#)).

# Typography Spacing

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 Naughty

Giving lines of text enough space allows the eye to clearly see each one, which helps with the flow of reading. The recommended line spacing (otherwise known as leading) is 1.5 times the type size — similarly, by then making the paragraph spacing 1.5 times the

 Nice

line spacing, the break between paragraphs is also made obvious.

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## ✗ Naughty

# Typography Alignment

Multiple lines of text should always be left-aligned, as the inconsistent spaces in justified and centred text can be a problem for users with learning difficulties. Justification also creates distracting white rivers running through the paragraphs.

## ✓ Nice

# Typography Formatting

Example

*Example*

Example

EXAMPLE

✗ Naughty

Keep text formatting as simple as possible to gain the best legibility for your users. Serif type is harder to read for visually impaired or dyslexic users, as its styling can obscure the shape of the letters — likewise, italics and underlines add visual noise. Capitalisation of

Example  
Example

✓ Nice

whole sentences or paragraphs also makes text more difficult to read AND LOOKS LIKE YOU'RE SHOUTING!

# Typography Formatting

## Example

- Example -

✗ Naughty

Lastly, avoid moving or blinking text, as visually impaired and dyslexic users can find this very distracting. Also worth noting that these effects can trigger epileptic seizures.

## Example

✓ Nice

# Typography

## Truncation

Exa...

Exa...

Exa...

Example 1

Example 2

Example 3

✗ Naughty

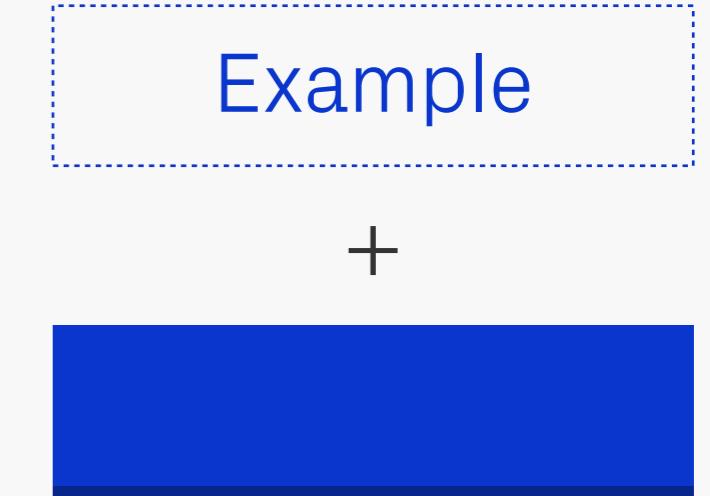
✓ Nice

Truncate text only where necessary, as it hides useful content.

# Typography

## Merging Text with Graphics

Wherever possible, try not to merge text with graphics and instead implement at a code level. This separation means words can be recognized by text-to-speech functions and read out loud, or have their size and colour changed according to the user's preference —



✗ Naughty

✓ Nice

both of which aren't possible when embedded into a graphic.

# Colour Visual Aids

## Information



Information

✗ Naughty

✓ Nice

Try to give users visual aids such as icons and colours to help them identify important content on a page. Colour coding is also a handy way to identify different types of content — something which can be especially

useful for those with cognitive impairments.  
Make sure it's used consistently though!

# Colour

## Don't Rely on Colour Alone



Passed



Failed

**✗ Naughty**

**✓ Nice**

However, don't rely on colour alone to convey a message, always include a secondary method as well. Some mobile devices suffer from poor colour contrast, or are used in less than ideal lighting situations, both of which can reduce the impact and visibility of colours.

Also bear in mind that approximately 8% of males have some form of colour blindness, affecting their ability to distinguish between certain hues — they would have difficulty telling the difference between the two Naughty shapes based on colour alone.

# Colour Alternatives



✗ Naughty

✓ Nice

If you're using colour to present information, such as the bars in a graph, then introduce a secondary method to distinguish between them. In this case patterns have been applied to the orange and blue areas.

# Colour Colour Contrast

Good contrast between text and background colours is the best way to make sure that important information is still visible for users with some form of colour blindness or visual impairment. Also check designs on an actual device in non-ideal lighting conditions, to

make sure there's still enough contrast in real-world situations.

Example

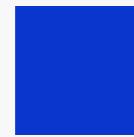
Example

✗ Naughty

✓ Nice



Foreground



Background



AA



AA (Large)



AAA

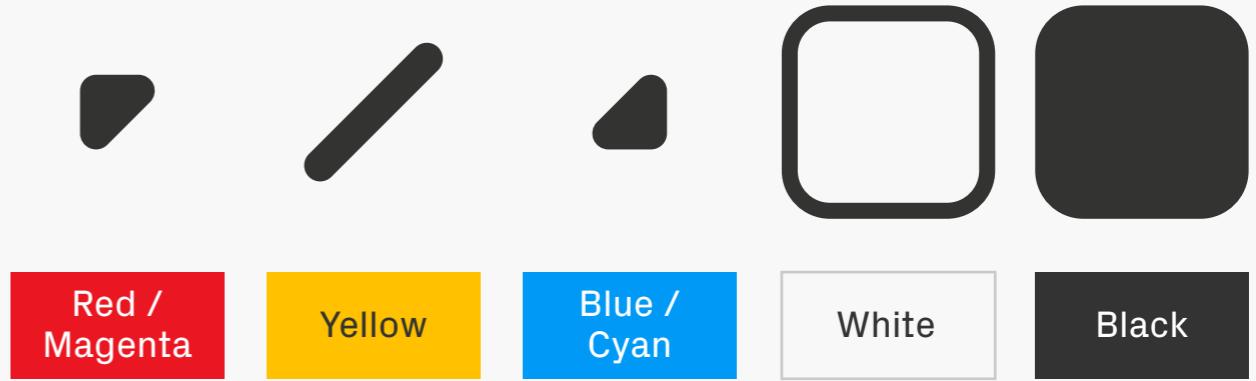


AAA (Large)

# Colour Colour Contrast Checkers

There are numerous tools out there for testing colour contrast. A couple of great options are [Colour Contrast Analyser](#) and [Jonathan Snook's web-based checker](#) — in either case just pop in the two colours and away you go! As a minimum you should aim to pass AA

standards. AAA is better, needing a lot more contrast, but too much could have a negative impact on your designs. The tests also differentiate between body sized copy and “Large” text, which is 18pt+ (or bold and larger than 14pt).



# Colour ColorADD

If you had to describe colours without using text labels, what would you do? Turns out a great solution already exists, [ColorADD](#) is a simple system that represents colours using symbols. By combining these symbols, which stand for the three primary colours in

subtractive light, you can create the whole spectrum — just as you would with paint or ink. It's also possible to make light and dark shades of those colours, by merging them with the symbols for black and white.



Pink

Light  
OrangeLight  
YellowLight  
GreenLight  
Blue

Orchid

Khaki



Red

Orange

Yellow

Green

Blue

Violet

Brown



Bordeaux

Brick

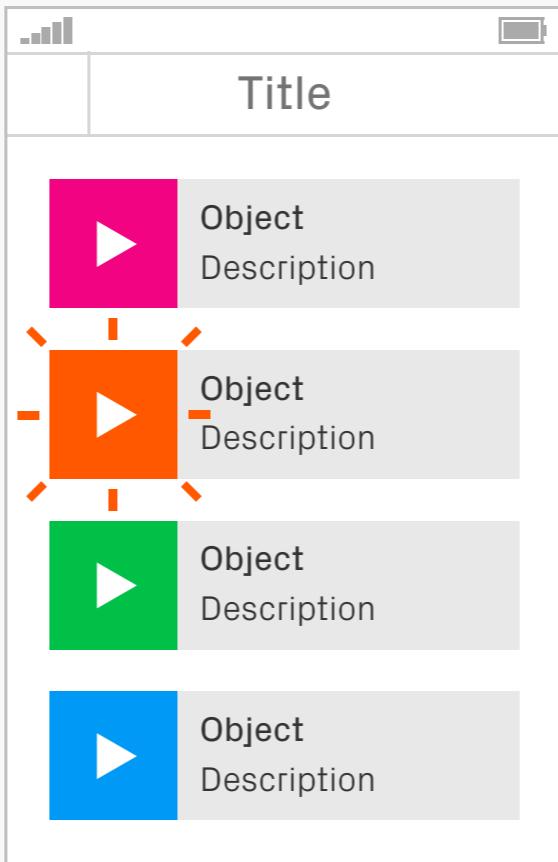
Dark  
YellowDark  
GreenDark  
Blue

Purple

Dark  
Brown

# Colour ColorADD

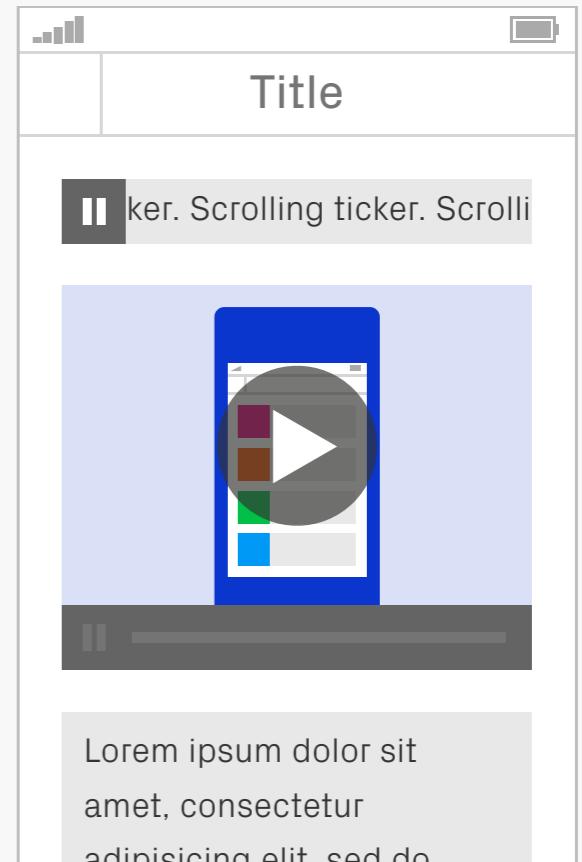
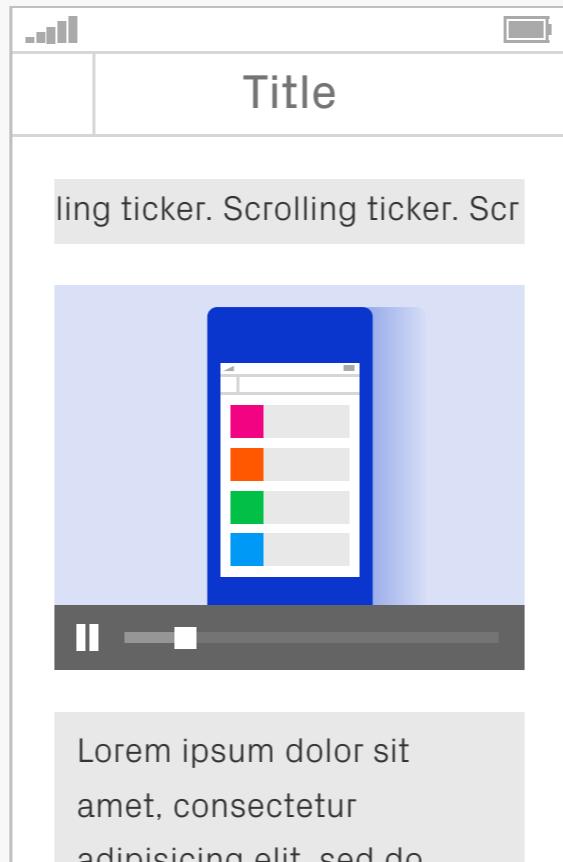
There's lots more information on the ColorADD site, including some great colouring pencils for colour blind people.



# Flashing

Users with photosensitive seizure disorders, such as epilepsy, can have episodes triggered by flashing at certain frequencies that last longer than a short period of time. The basic recommendation is that there shouldn't be anything on the screen which flashes more

than three times a second. For more detailed information have a read of [WCAG's \(Web Content Accessibility Guidelines\) page on the "Three Flashes or Below Threshold".](#)



✗ Naughty

## Movement

Movement may be problematic for some people, such as those with learning disabilities or attention disorders, as it can be very distracting and breaks their concentration from information elsewhere on the page. Others who can't read quickly will also want

elements to stay static, so they have a chance to take everything in. If you really need to include moving content in your product, then prevent it from starting automatically and provide the option to pause or stop, should users choose to press the play button.

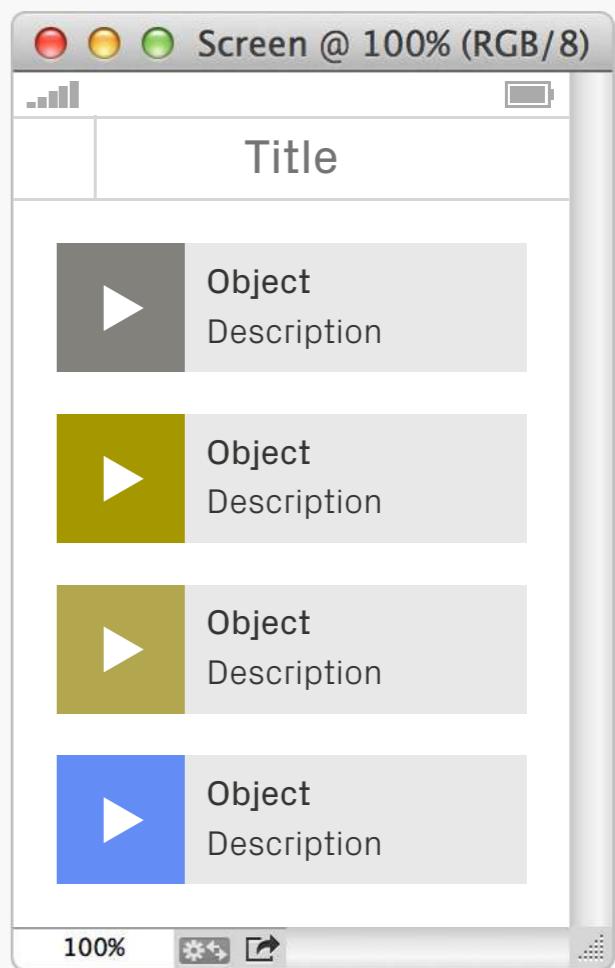
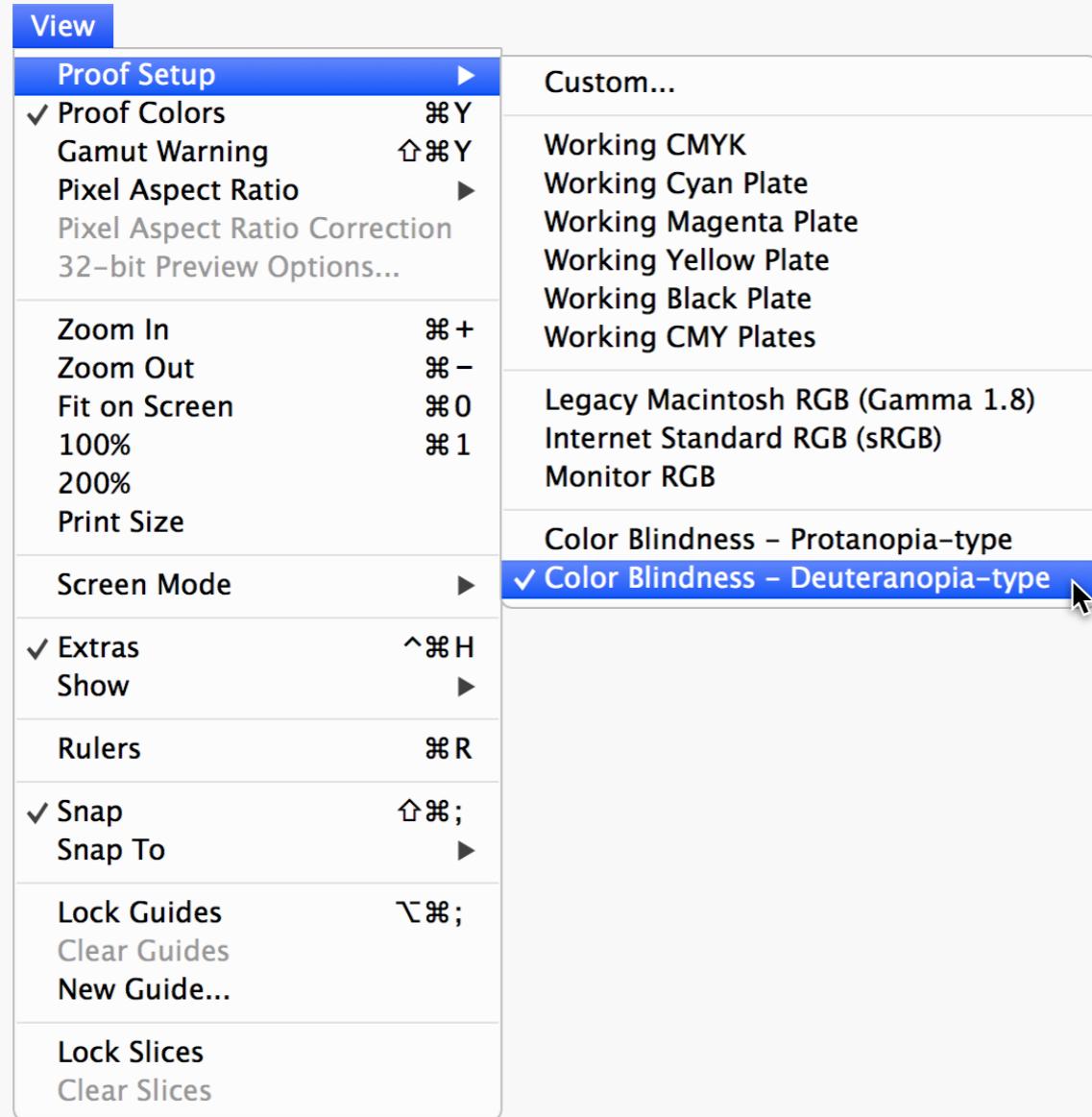
✓ Nice

# Testing



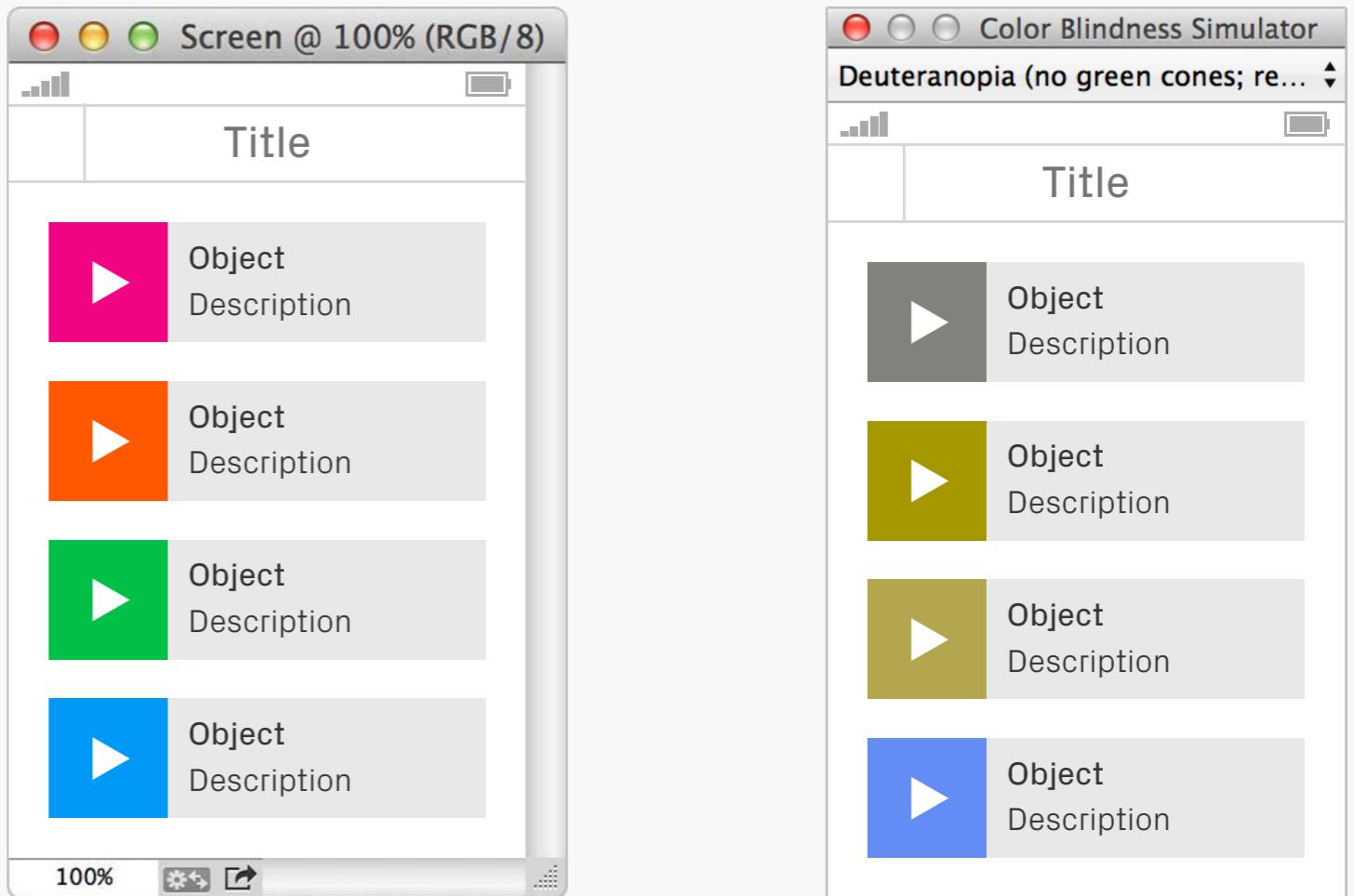
Another piece of general good practice that can be applied to accessibility! Remember to test your app's accessibility features such as black and white, zoomed view, and text-to-speech. Try them out on real devices, rather than simulators, as you'll get a better feel for

how well they're working. Speaking of real things, the best tests are with people that regularly use these features.



# Testing Colour Blindness Preview in Adobe

Tucked away in the *View > Proof Setup* menu are preview options for the most common forms of colour blindness — this is a great way to quickly check if there might be contrast issues with your chosen palette.



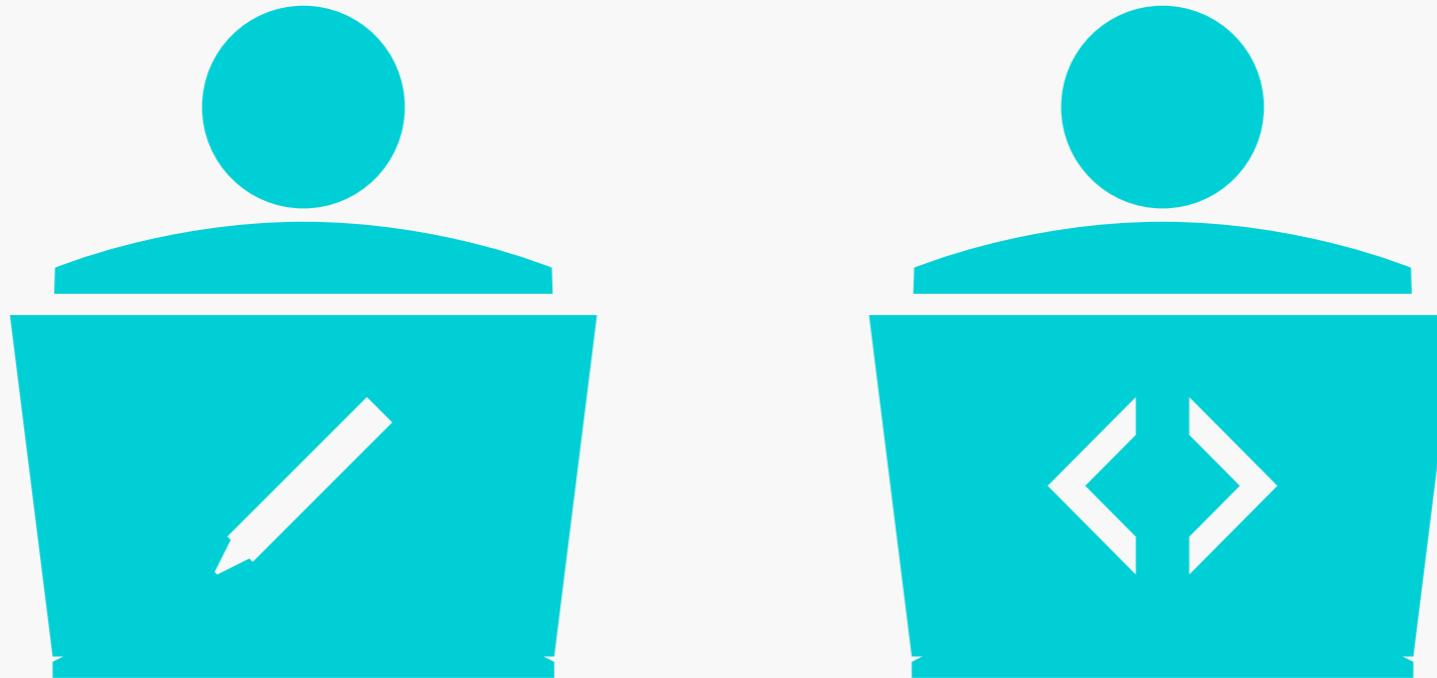
# Testing Sim Daltonism

[Sim Daltonism](#) is a more advanced application for checking colour blindness accessibility, featuring previews for most forms of the condition. Rather than being a Photoshop only tool, it works across the entire OS, providing a

resizable floating window that filters whatever's underneath the mouse cursor.

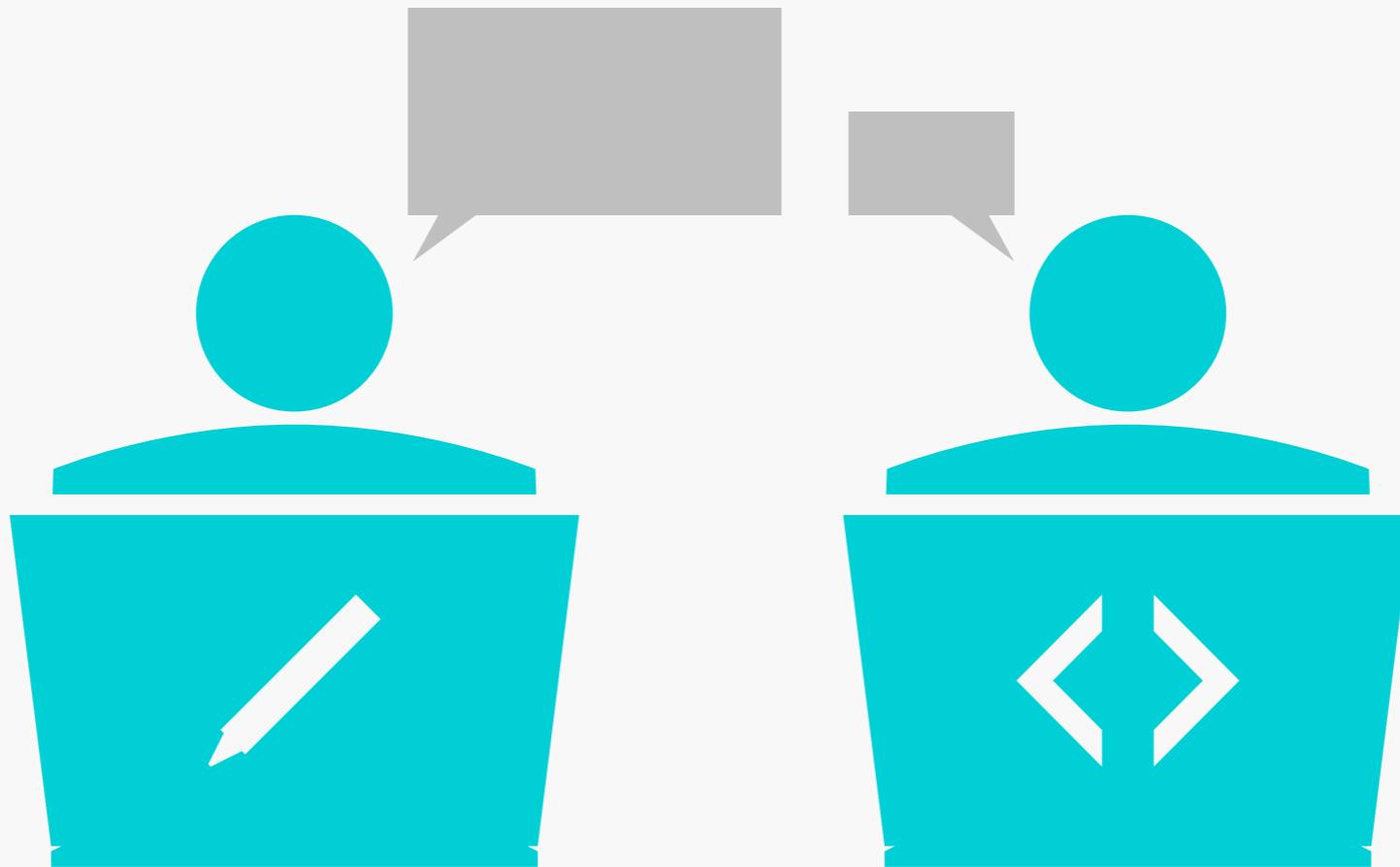
# **DESIGN AND DEVELOPMENT**

# Design and Development



Design is only one part of releasing a product, equally important is its development. There used to be a distinct barrier between the two disciplines, with designs being finished then sent off to be built by developers — classic waterfall. But that kind of disjointed process

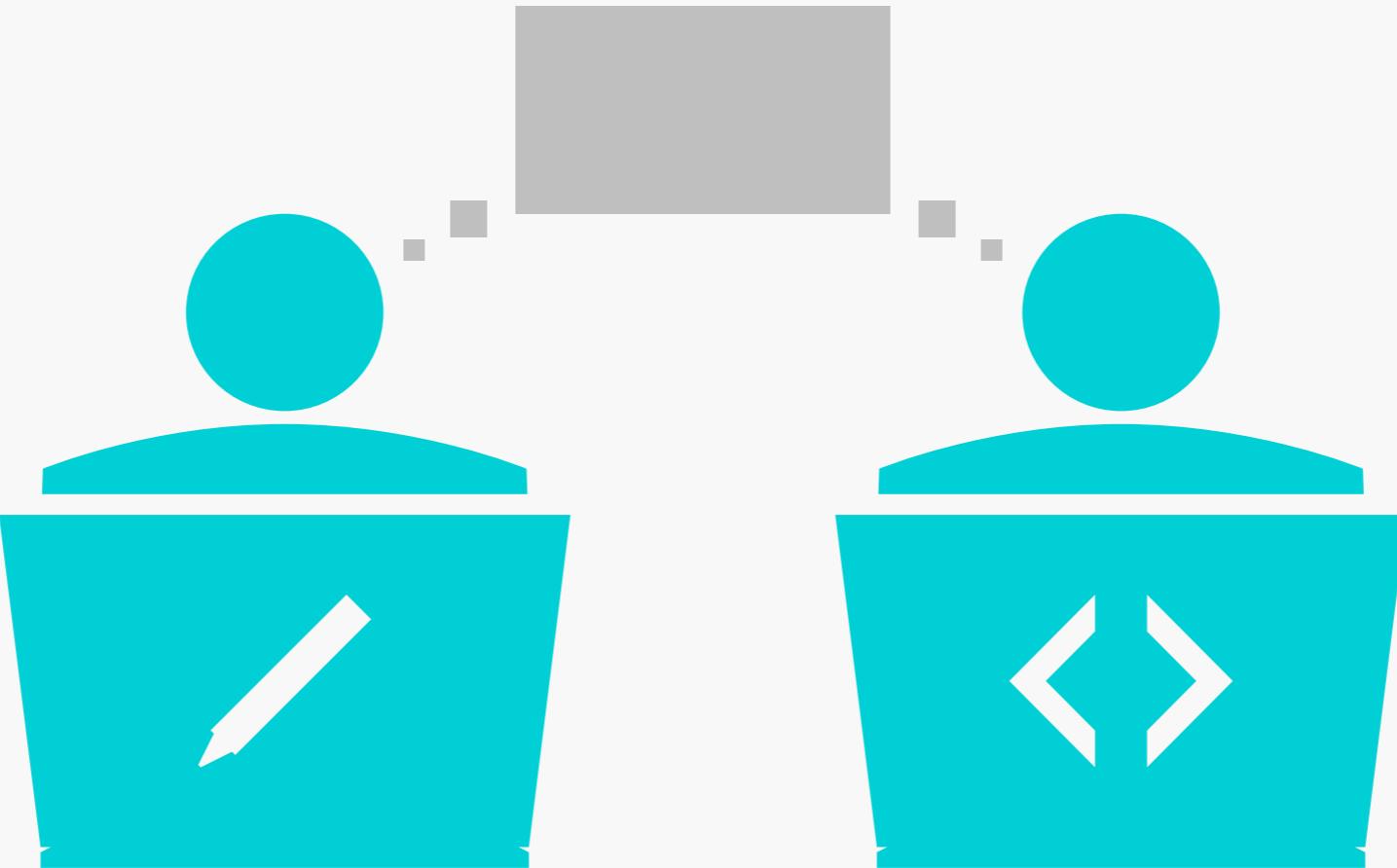
often produces unsatisfactory results. It's much better to work on a problem together as a team, which is the main focus of this chapter. Also highlighted are ways to make the transition from design to development more efficient, saving time and hassle for everyone.



# Essentials Communication

This first point is an essential part of working together. Rather than receiving a product build that doesn't look like it was intended, or designs that will be far too difficult to implement, good communication will allow you to explain your decisions, discuss them and if

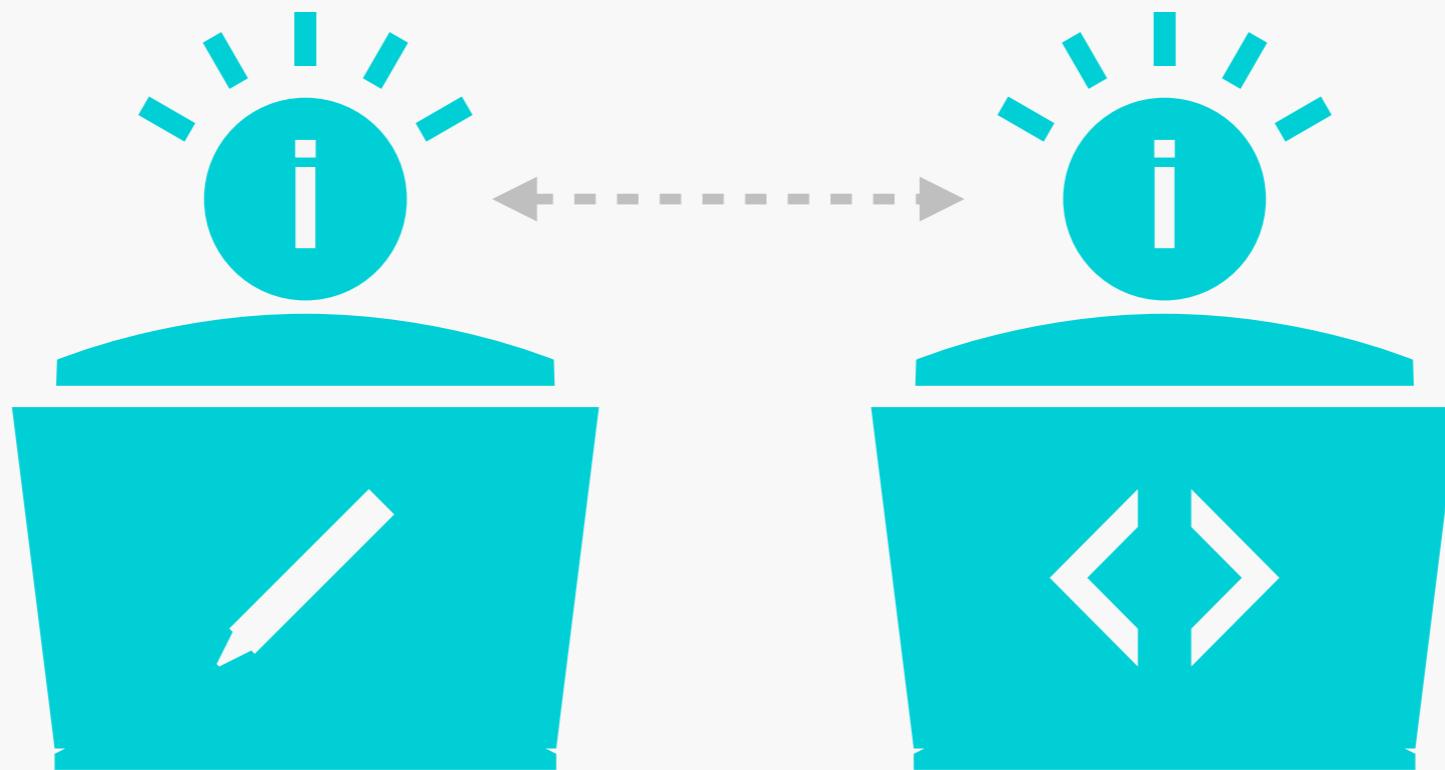
necessary come to a compromise — removing a lot of tension in the process. As a certain advertising campaign used to say: "It's good to talk."



# Essentials Collaboration

Rather than staying in silos and sticking to your disciplines, try working together a little more. If you're having a design meeting to generate ideas, then get the developers on your project involved as well. Not only will this add a different perspective, but they'll also

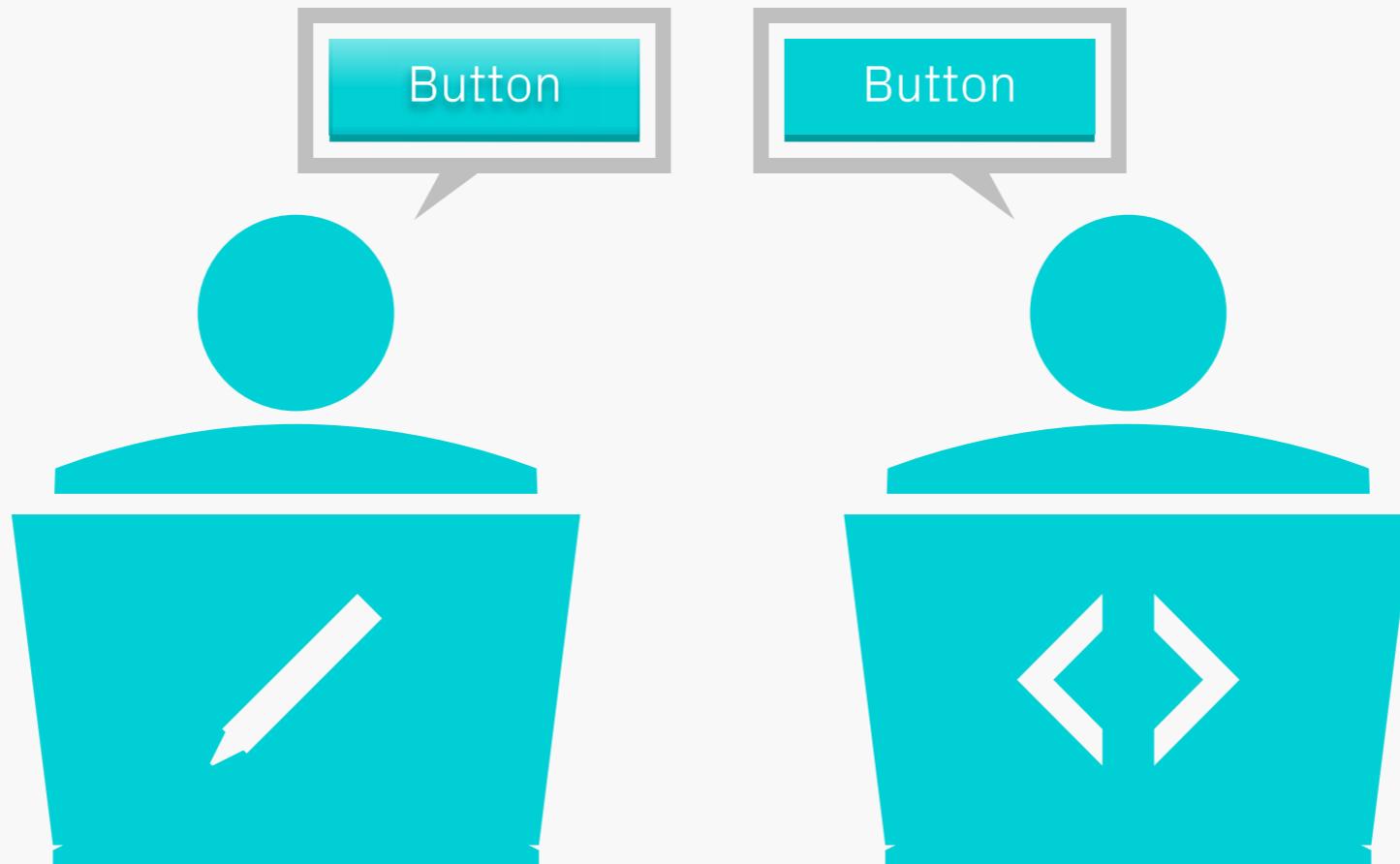
have valuable input on what's technically possible. In the long run, this means everyone on the team feels more invested in the project — which results in a better end product.



# Essentials Learning

By working together more closely, you'll start to learn about each other's disciplines, and in particular, any pain points you might have. By knowing these, you can both take steps to reduce them, which will make the project far more enjoyable. An additional benefit of

learning is more autonomy in decision-making. You won't need to keep asking whether your thinking is sound. Instead you'll know enough about what's possible, or why something should be a certain way, to make the choice yourself.



## Essentials Be Realistic

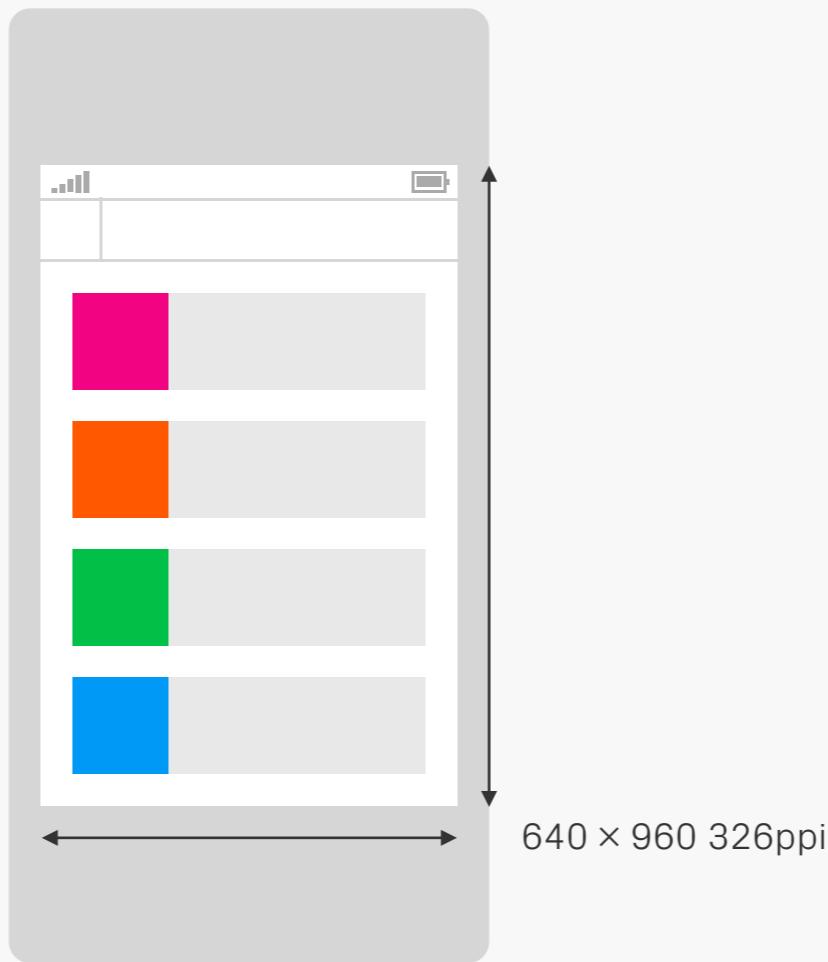
A frequent sticking point between designers and developers is the difference between the original mockups and the finished app. The previous points about teamwork can help get the two closer together, but there should be some realism as well. Instead of trying to get

your designs matched to the pixel, ask yourself whether that time could be better spent improving the app or fixing bugs. It's no good having a beautiful product which is difficult to use or keeps crashing.

# Preparation Specifications

Before starting any design work find out as much as you can about the app's intended platform. Screen size is an obvious starting point, as well as the pixel density, but also track down its bit depth (how many colours the screen can actually display) and any

limitations around interaction or animation frame rates. The development environment might also have restrictions in terms of available fonts or rendering effects, so check those out too.

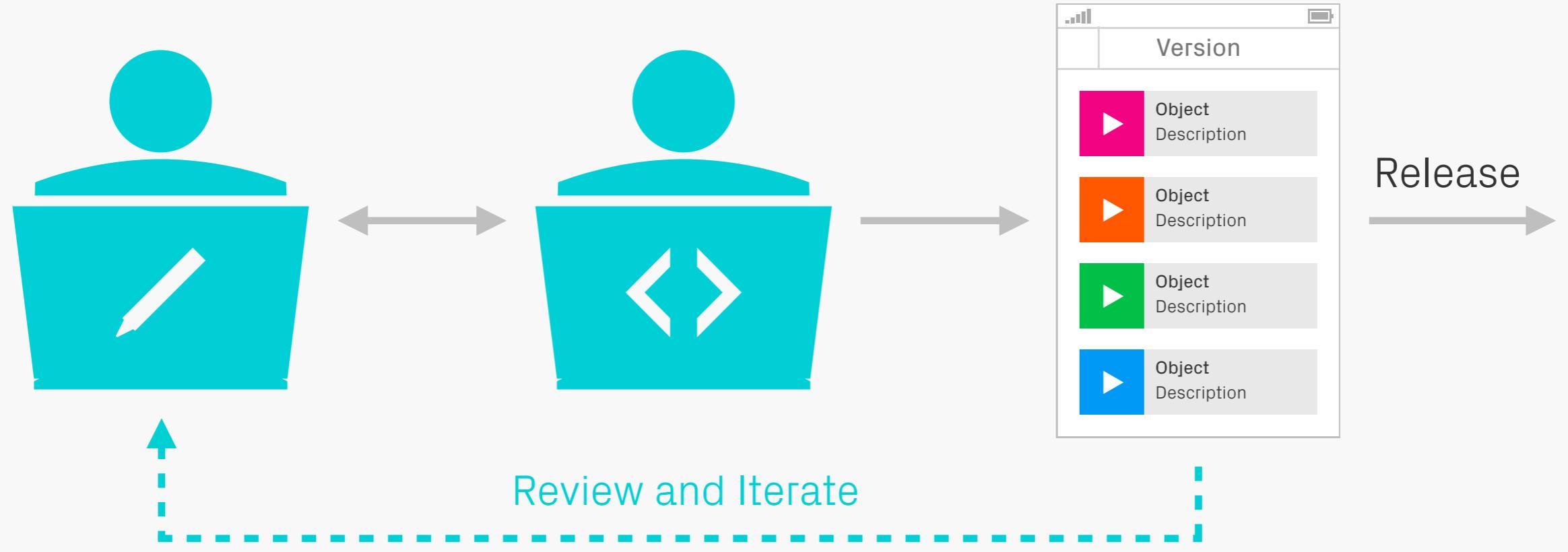


# Preparation Deliverables



Part of the specification discovery process is learning what you need to deliver to the developers, so they can build the product. What format do they need the files in: PNGs, PSDs, vectors? If the designs will be rendered in code, what limitations are there in terms of

colours and effects? Do assets need to be 9-sliced so they're scalable in the product? Getting hold of this information now means you can design around any requirements from the start.



# Preparation Workflow

In addition to figuring out what you need to deliver, sit down with the developer(s) and discuss how you're going to work together. Will the project be waterfall or agile? How often will there be builds of the app to look at? What resources do you need from each other,

and how are you going to manage sending files back and forth? What's the best way to track changes and requests? It's also important at this stage to schedule in regular review sessions, so you can both sit down and discuss the project's progress.

- <> PPP-09 Work on translated version
- / PPP-08 Supply fonts
- <> PPP-07 Create a test build and send to Gypsy
- <> PPP-06 Squares need to be left aligned
- / PPP-05 What colour is the text?
- <> PPP-04 Create search results page
- / PPP-03 Down state for play button needed
- <> PPP-02 Fix bug in playback controls
- / PPP-01 Supply green square asset

# Preparation Tracking

An essential part of the workflow is setting up some sort of tracking system. Developers will want somewhere to request additional or missing assets, as well as log bugs, and designers will want to note down any visual changes that they'd like updated (along with

any bugs they spot too!). Trying to do this over email is messy, so use something more suitable for the task. This can be something as simple as a shared to-do list, right up to full-blown project management software.

# Design Appropriate Styling

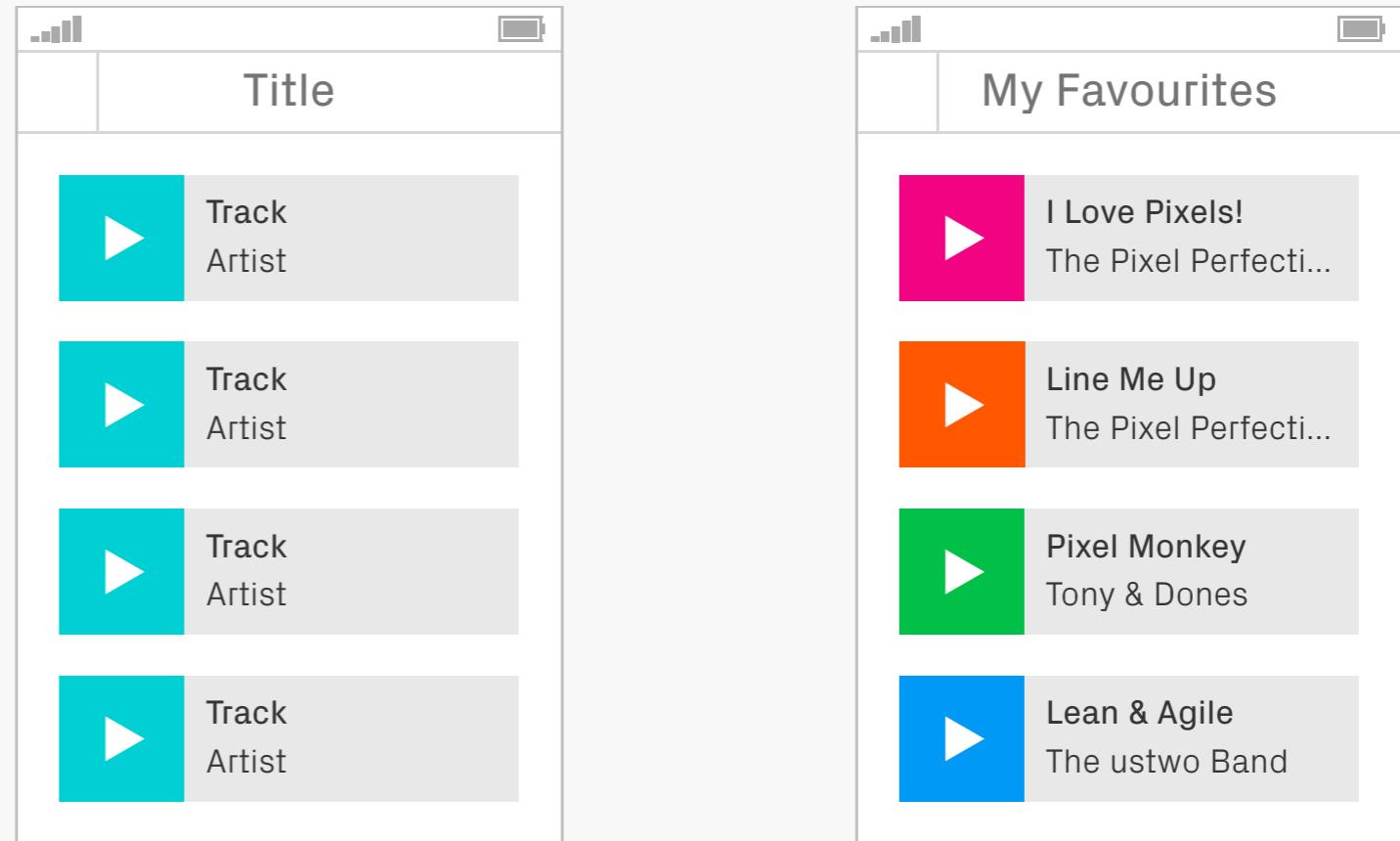


✗ Naughty

✓ Nice

As part of the project preparations you should have found out any visual limitations, so try to stick to those when creating your designs. Use typefaces that are available on the device, and keep to styling that can be recreated faithfully. Simple gradients, drop shadows, and strokes

are usually OK, but more advanced effects might not be possible. If in doubt, have a chat with the developer to see what you can and can't do.



**✗ Naughty**

## Design Realistic Content

To maintain the team's collective sanity, try to use realistic content in your designs. It's incredibly annoying when you have to go back and redo everything because there wasn't enough room left for an average amount of text. Also consider what happens when worst

case scenarios occur, such as too many words or a missing image — you can bet your life they'll crop up when the app is out in the wild.

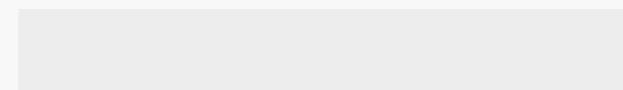
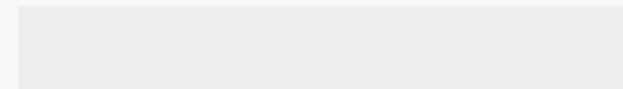
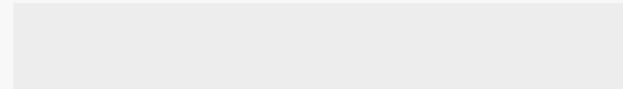
**✓ Nice**

# Design Keep Everything Editable

## Layers



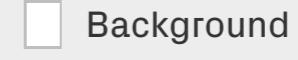
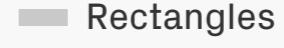
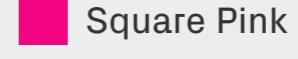
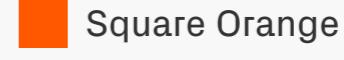
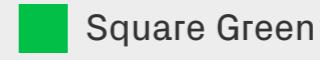
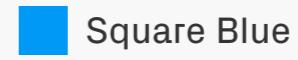
Design



## Layers



Title



✗ Naughty

✓ Nice

Design is rarely a one-step process, so keep your files editable — that way you can quickly make changes and updates. It's also very useful as sometimes developers will want the source files to see how a design's been

created, or because they want to export assets themselves.

Active

Button

Selected

Disabled

✗ Naughty

✓ Nice

# Design Object States

Remember to design and deliver the different states for objects and export them all at the same size, so they're aligned and pixel perfect.

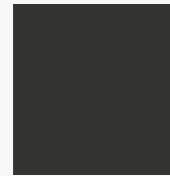
# Design Style Guide



Accent Colour  
#15d0d4



Secondary Colour  
#757575



Body Text Colour  
#333333

## Title Text

Px Grotesk Light 36pt #15d0d4

## Subtitle Text

Px Grotesk Light 36pt #757575

### Body Text

Px Grotesk Light 14pt #333333

Divider Line 2px #999999

Active

Selected

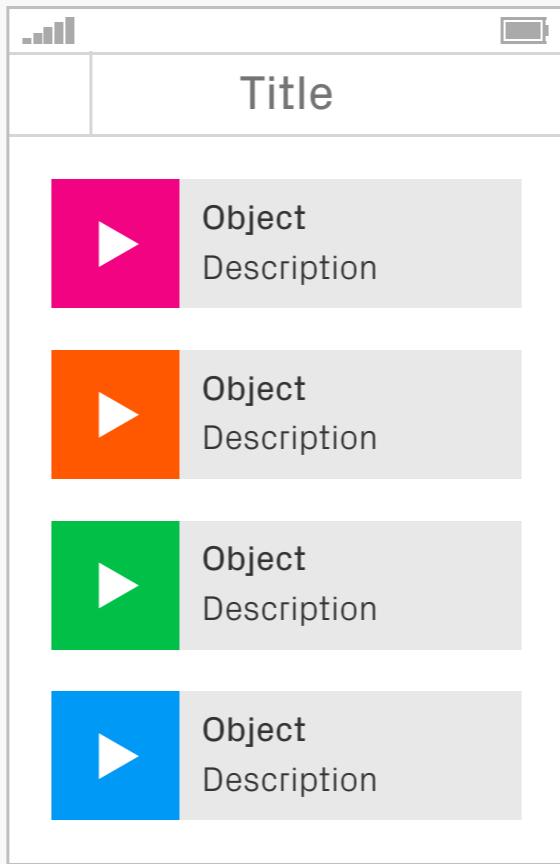
Disabled

Style guides are a really handy resource to have on a project, since you can gather all the various assets and styling in one place, see if everything looks consistent and then send off to the developer as a reference guide. Also, if this file is kept up to date and you both use it

as the master document for all the project assets and styles, you'll no longer need to go through every single screen mockup making tiresome changes. Whatever's in this bible is correct and variations elsewhere can be ignored. It's liberating.

# Design Design in Code

One way of making sure that everything looks and works how you want it to, is designing in code. You could write this from scratch, but it might be quicker to create a mockup as usual, then export the layers and styles directly to CSS. Once that code's generated you're well



```
.square_pink {  
background-color: #ed0082;  
position: absolute;  
left: 32px;  
top: 128px;  
width: 96px;  
height: 96px;  
}  
.rectangle {  
background-color: #e8e8e8;  
position: absolute;  
left: 32px;  
top: 128px;  
width: 96px;  
height: 96px;  
}
```

on your way to making simple interactive prototypes in HTML — designs really start to come to life once you can play around with them on a device.

Colour Profile

Yes

No

Code

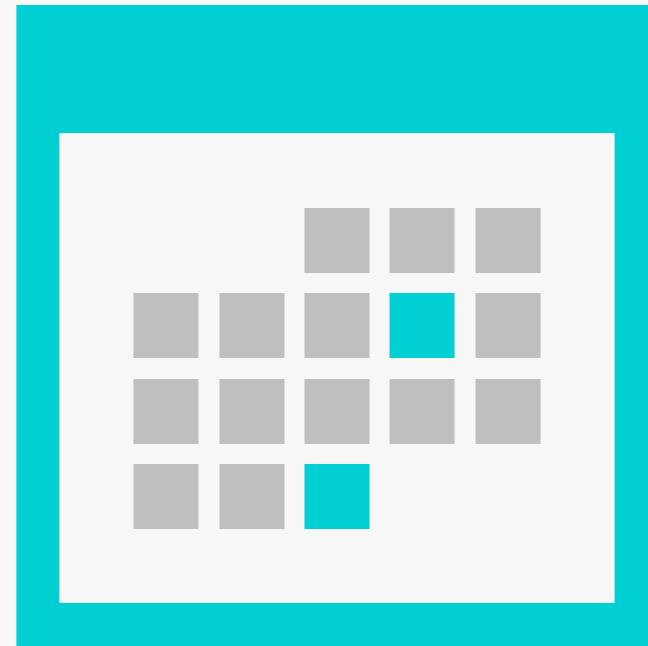
✗ Naughty

✓ Nice

## Design Colour Profiles

As mentioned in other chapters, avoid using colour profiles as they can cause mismatches between assets and code.

# Delivery Timing



■ = Deadline

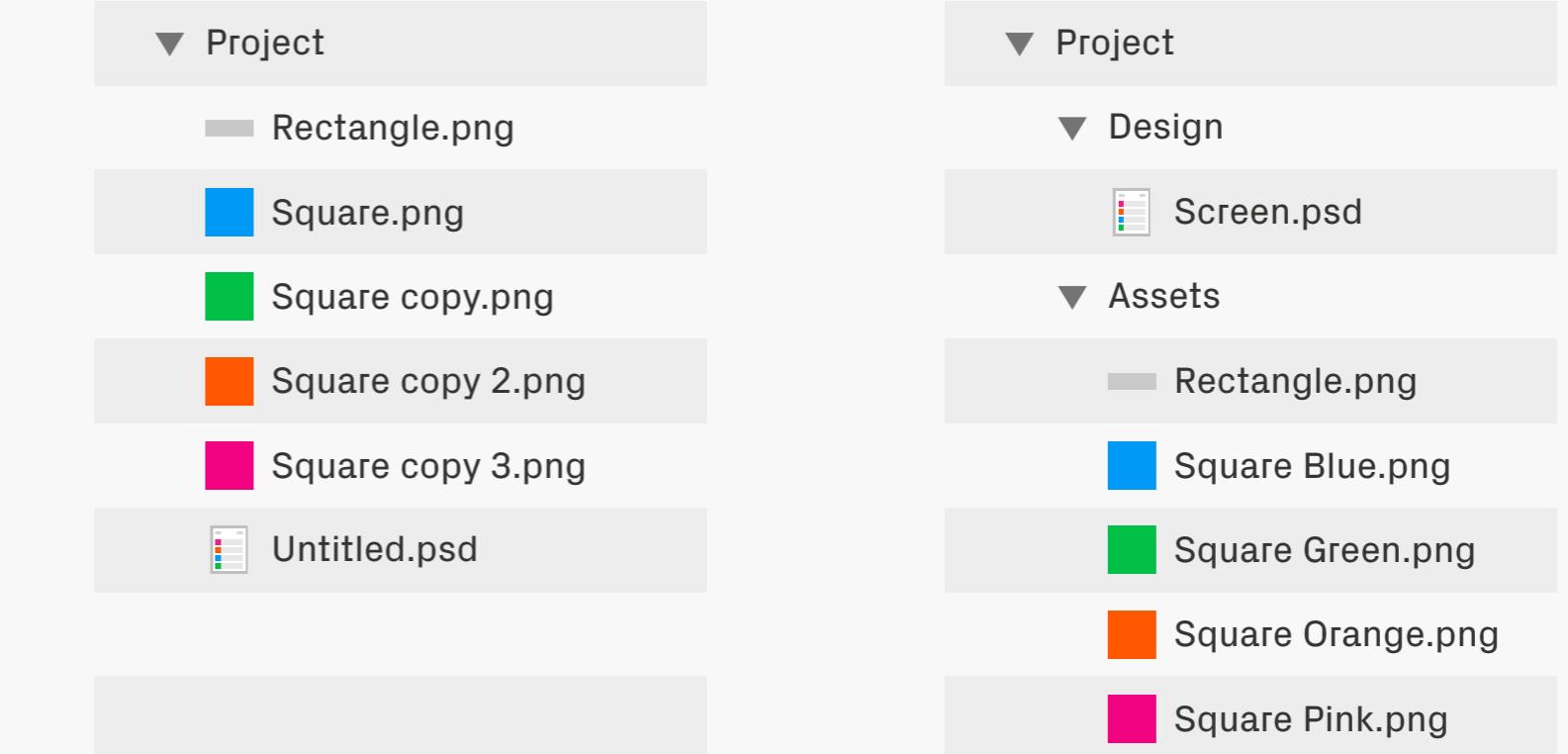
✗ Naughty

Try to deliver work on time, not only does it create bad feeling when people miss deadlines, but you could also become a bottleneck in the project. If something's taking longer than expected, then speak to the team in advance so everyone can adapt to the

✓ Nice

change in schedule. Chances are it won't be a problem and they can work on something else in the meantime.

# Delivery Organisation



Keeping your project files organised will make the transition from designer to developer (and back again) far more efficient. Name and structure everything logically and consistently, using a system that you both understand. This also applies to the content within files (for

example Photoshop layers) as other people might want to work on them.

# Delivery

## Naming Systems

The naming system you use plays a large part in setting up a good organisational structure. At the start of the project speak to the developer about the best way to name files, as they often have a preferred method and then adapt it over time if needed. A good approach is to base your naming on a hierarchical system, which starts off with a broad identification of the component and then progressively adds more information. So you might end up with a structure like this:

*type\_location\_identifier\_state*

The *type* refers to the category the component belongs to, such as:

<i>bg</i> (background)	<i>btn</i> (button)
<i>icn</i> (icon)	<i>img</i> (image)

The next step is to add the screen or location where this component appears (*global* means it's used across multiple sections):

*bg\_help*    *btn\_home*    *icn\_global*

Then add the unique identifier, as an example, buttons on the home screen which create and delete documents would be called:

*btn\_home\_new*    *btn\_home\_delete*

Finally, if the component has multiple states then add them to the end:

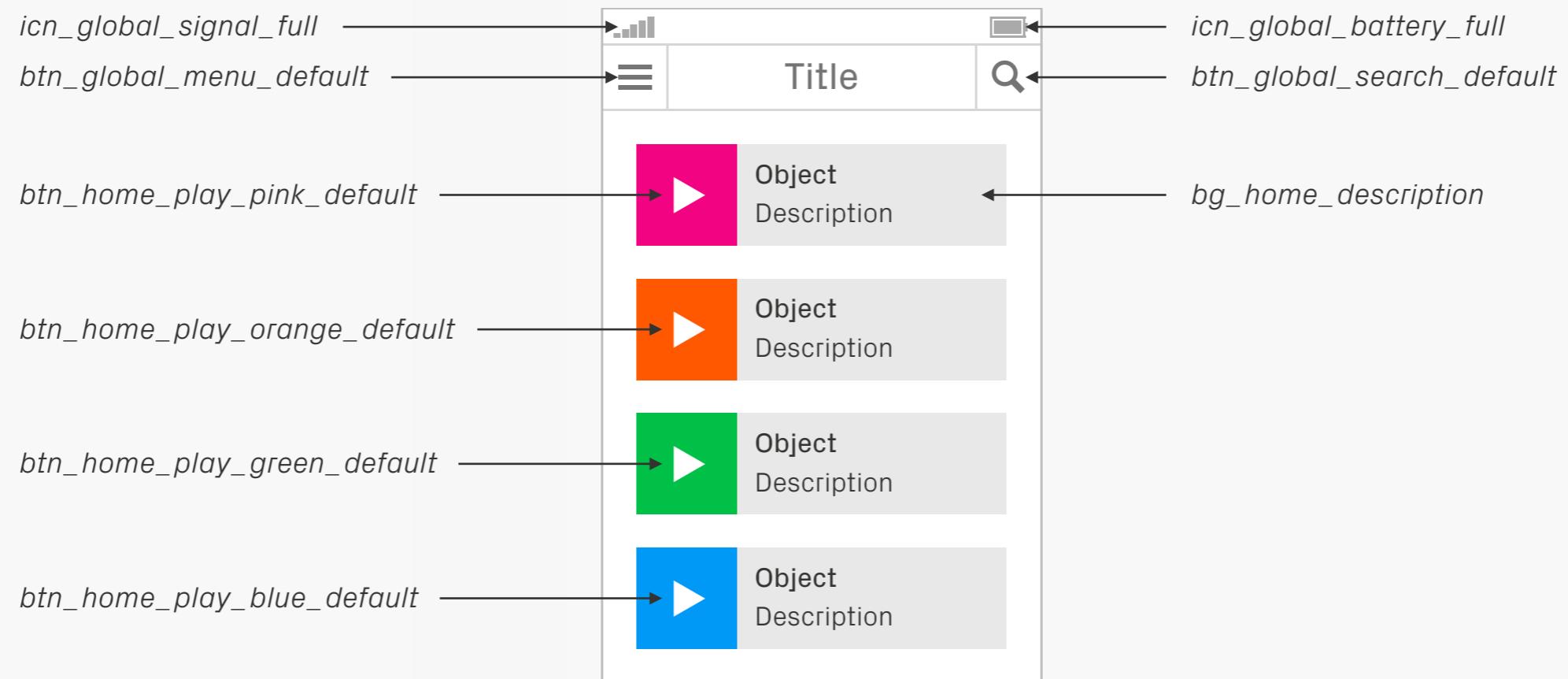
*btn\_home\_new\_default*  
*btn\_home\_new\_highlighted*

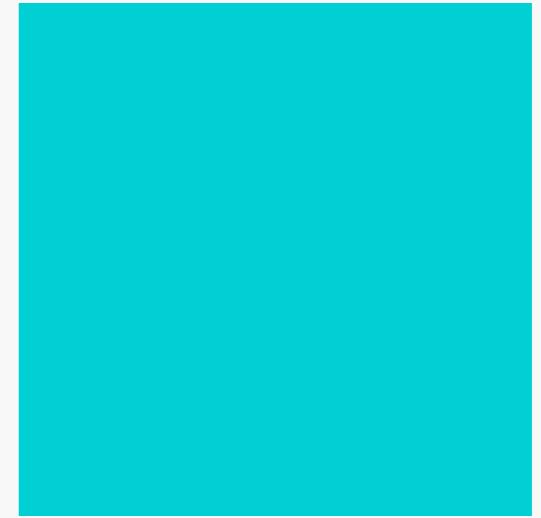
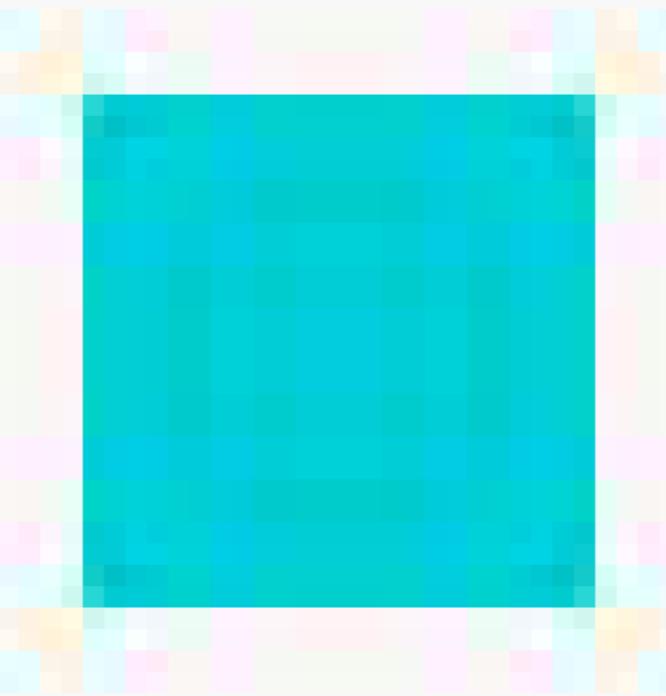
As an aside, the system shown here uses lowercase letters and underscores instead of spaces in the names, which is our usual choice. Another method is CamelCase, which uses no spaces and instead capital letters to define each part of the structure:

*BtnHomeNewDefault*  
*BtnHomeNewSelected*

# Delivery

## Naming Systems



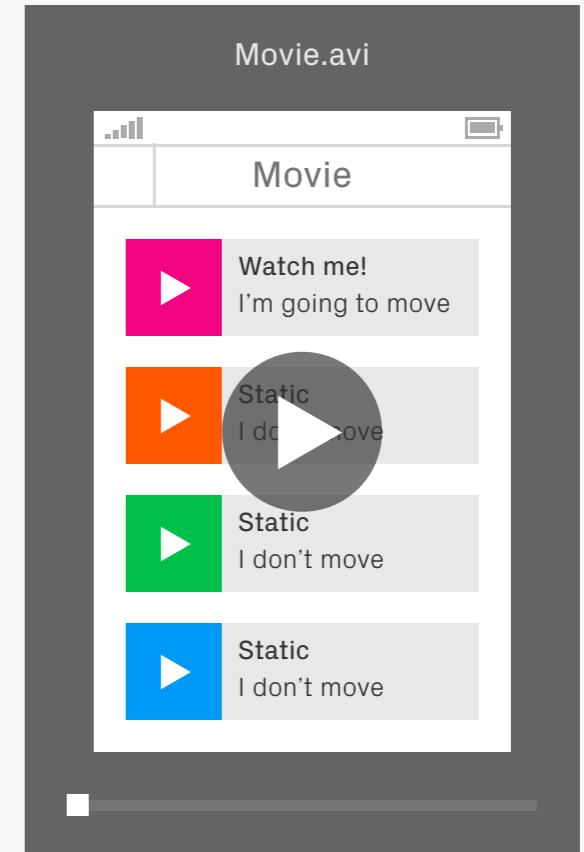
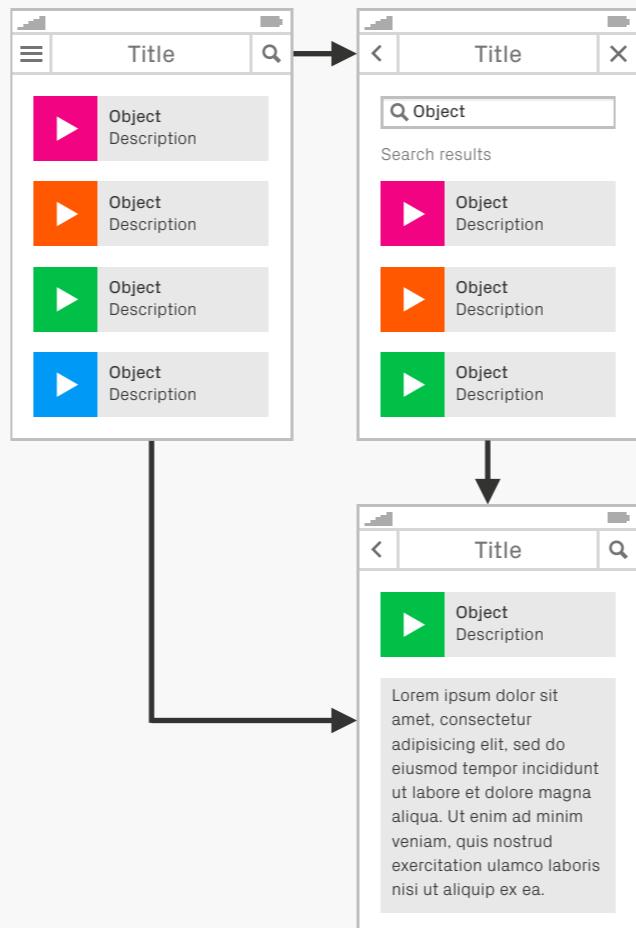
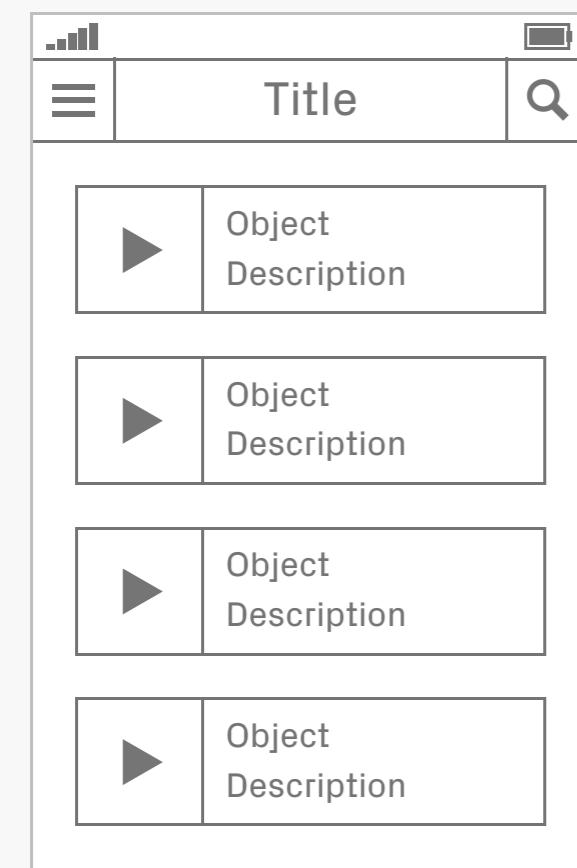


✗ Naughty

✓ Nice

## Delivery Don't Compress Assets

When exporting assets keep them in uncompressed formats like PNG, as development environments will often apply their own compression anyway.



# Delivery Specifications

When sending designs over to developers, try to include as much useful information as possible. Lengthy documents listing all the measurements on each screen will probably be ignored, but flows and prototypes that demonstrate how an app works can be

incredibly useful. As are movie clips showing the desired speed and style of motion.

- Assets
- Object States
- Style Guide
- Flows
- Check Again*

**Delivery**  
Check! And Then  
Check Again!

Before sending off a delivery to the developer,  
check through to see if you've included  
everything they need and then check again  
just to make sure!

# PHOTO SHOP & USTWO

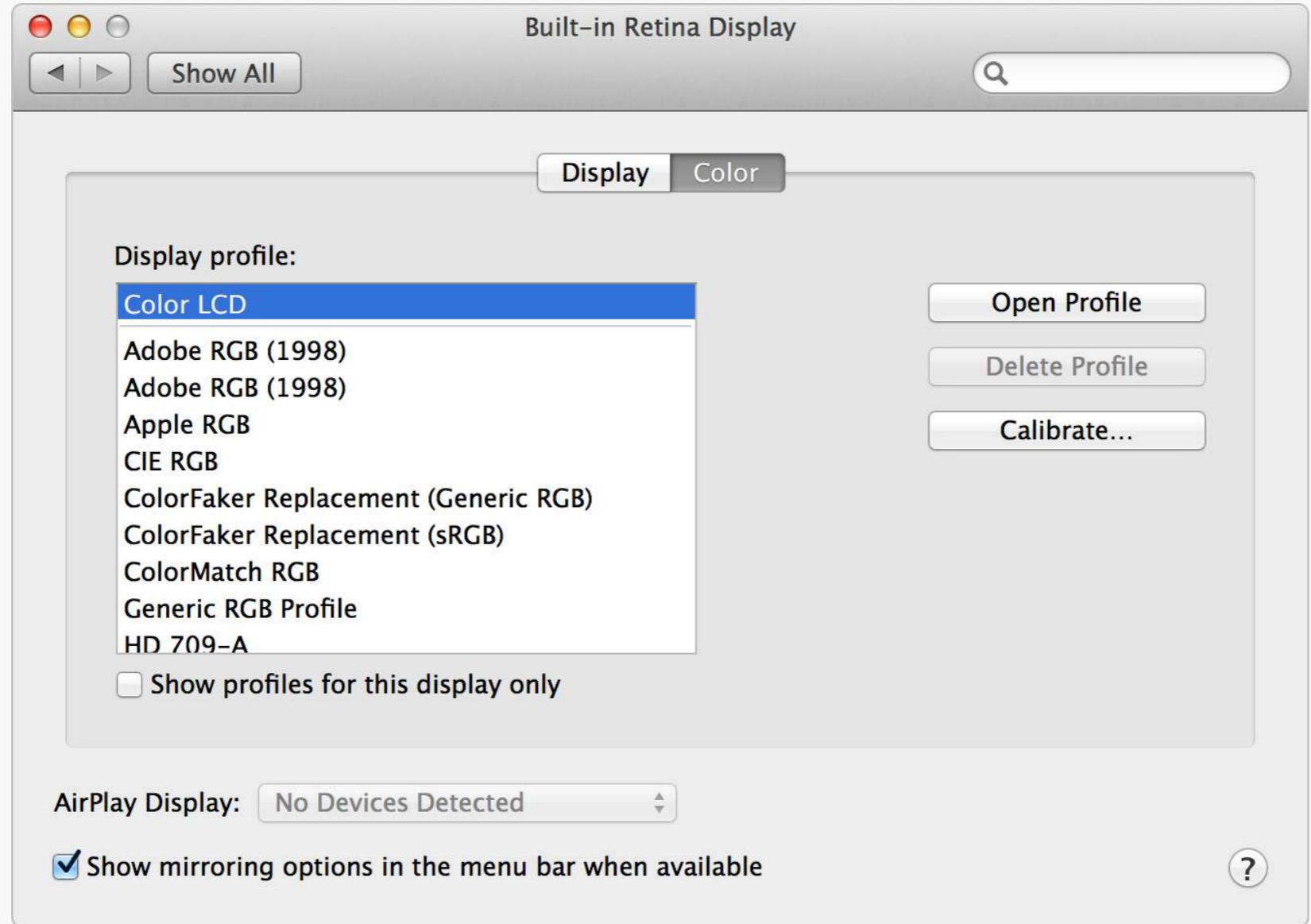
---

Now that we've covered a lot of design principles, let's dive into some specifics. Photoshop is our day-to-day tool here at ustwo, and across the industry as a whole, so knowing how to use it properly is pretty essential. The following sections show you some of the methods and techniques we use...



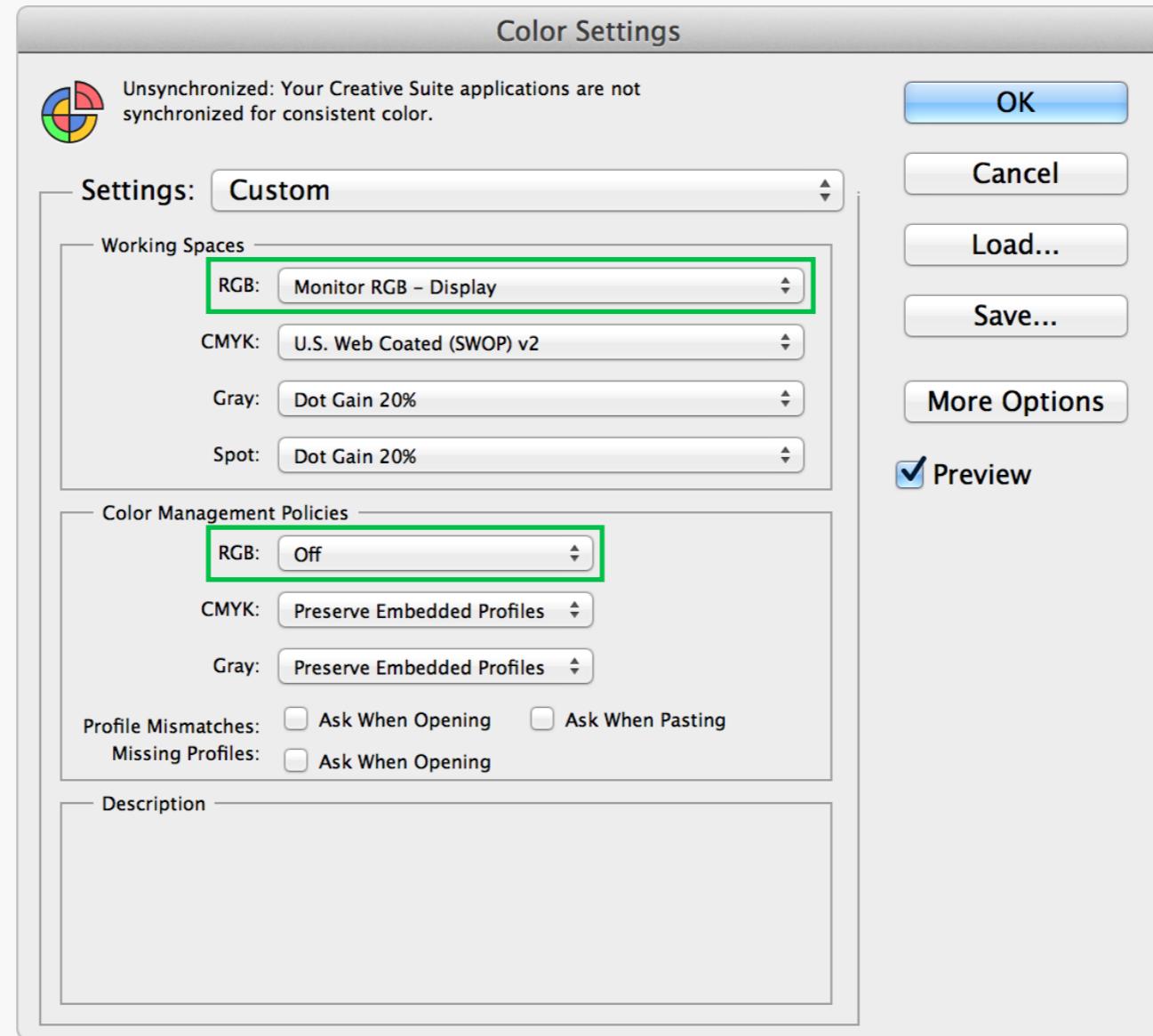
Photoshop

# COLOUR PROFILES



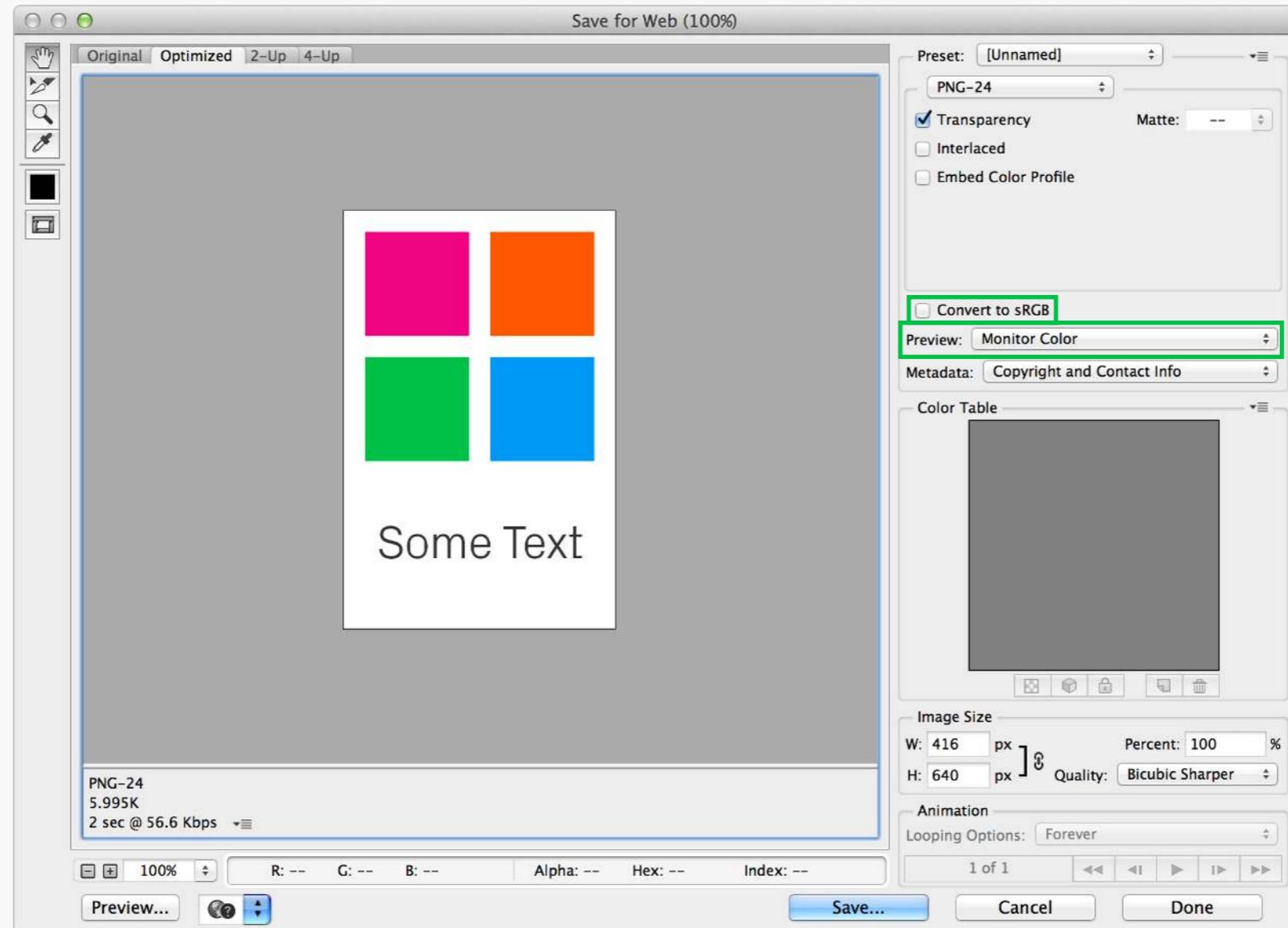
# System Settings

To avoid any nasty colour jumps between Photoshop and Mac OS X, your colour settings need to be set up correctly. The first thing to do is make sure *System Preferences > Displays > Color* is set to the device you are currently using — in this case Color LCD.



# Photoshop Colour Settings

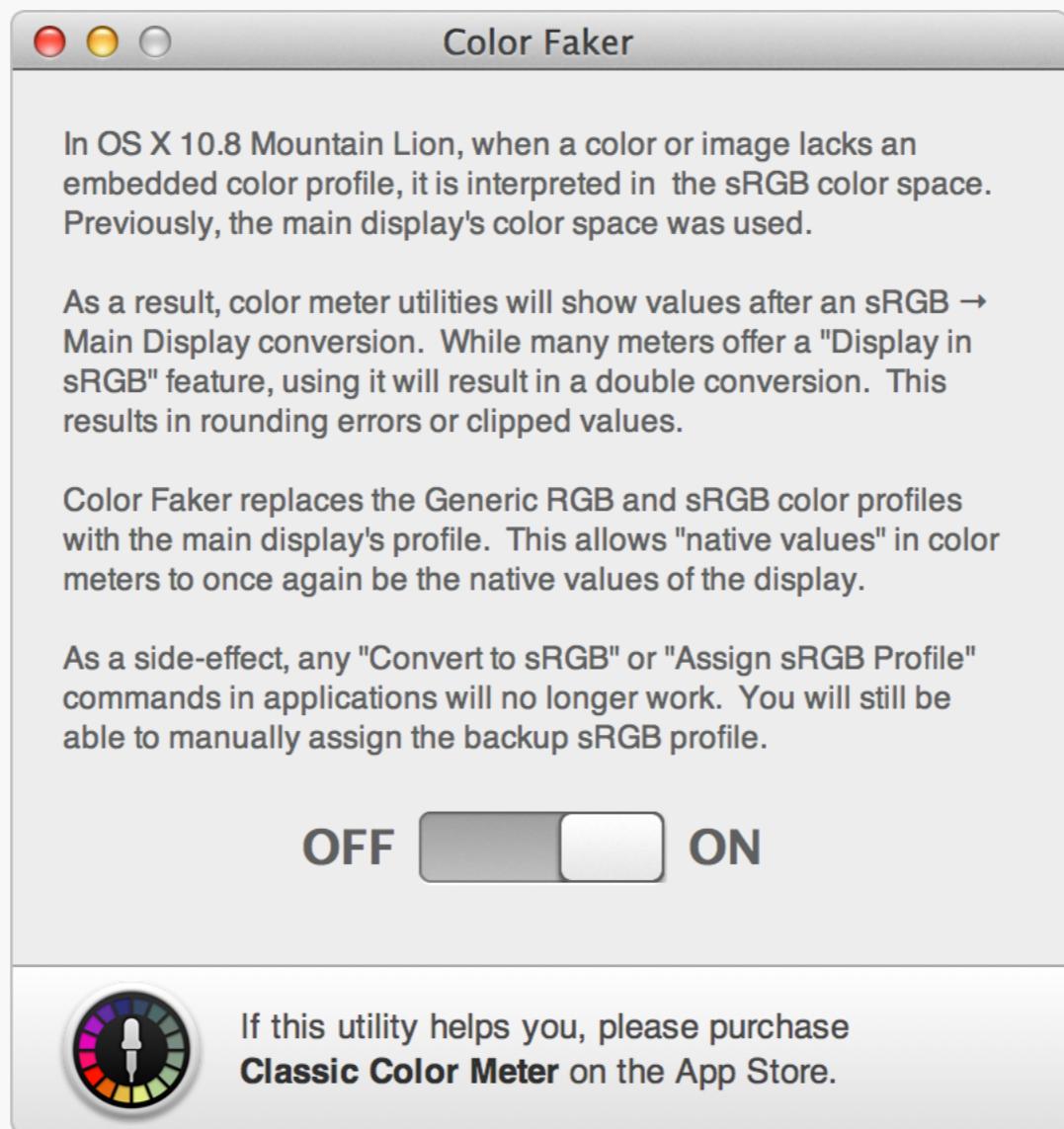
Next, in Photoshop, go to *Edit > Color Settings...* and change *Working Spaces > RGB* to *Monitor RGB – Display*. Also change *Color Management Policies > RGB* to *Off*.



## Photoshop Save for Web

Additionally, in *Save for Web* the *Convert to sRGB* option needs to be deselected, and *Preview* should be set to *Monitor Color*. Your colours should now be consistent.

# Color Faker



The screenshot shows a Mac OS X window titled "Color Faker". The window contains text explaining the issue with color profiles in OS X 10.8 Mountain Lion and how Color Faker solves it. It features a toggle switch labeled "OFF" and "ON". Below the switch is a small icon of a color wheel with a microphone symbol and a message encouraging users to purchase the full version on the App Store.

In OS X 10.8 Mountain Lion, when a color or image lacks an embedded color profile, it is interpreted in the sRGB color space. Previously, the main display's color space was used.

As a result, color meter utilities will show values after an sRGB → Main Display conversion. While many meters offer a "Display in sRGB" feature, using it will result in a double conversion. This results in rounding errors or clipped values.

Color Faker replaces the Generic RGB and sRGB color profiles with the main display's profile. This allows "native values" in color meters to once again be the native values of the display.

As a side-effect, any "Convert to sRGB" or "Assign sRGB Profile" commands in applications will no longer work. You will still be able to manually assign the backup sRGB profile.

**OFF**  **ON**

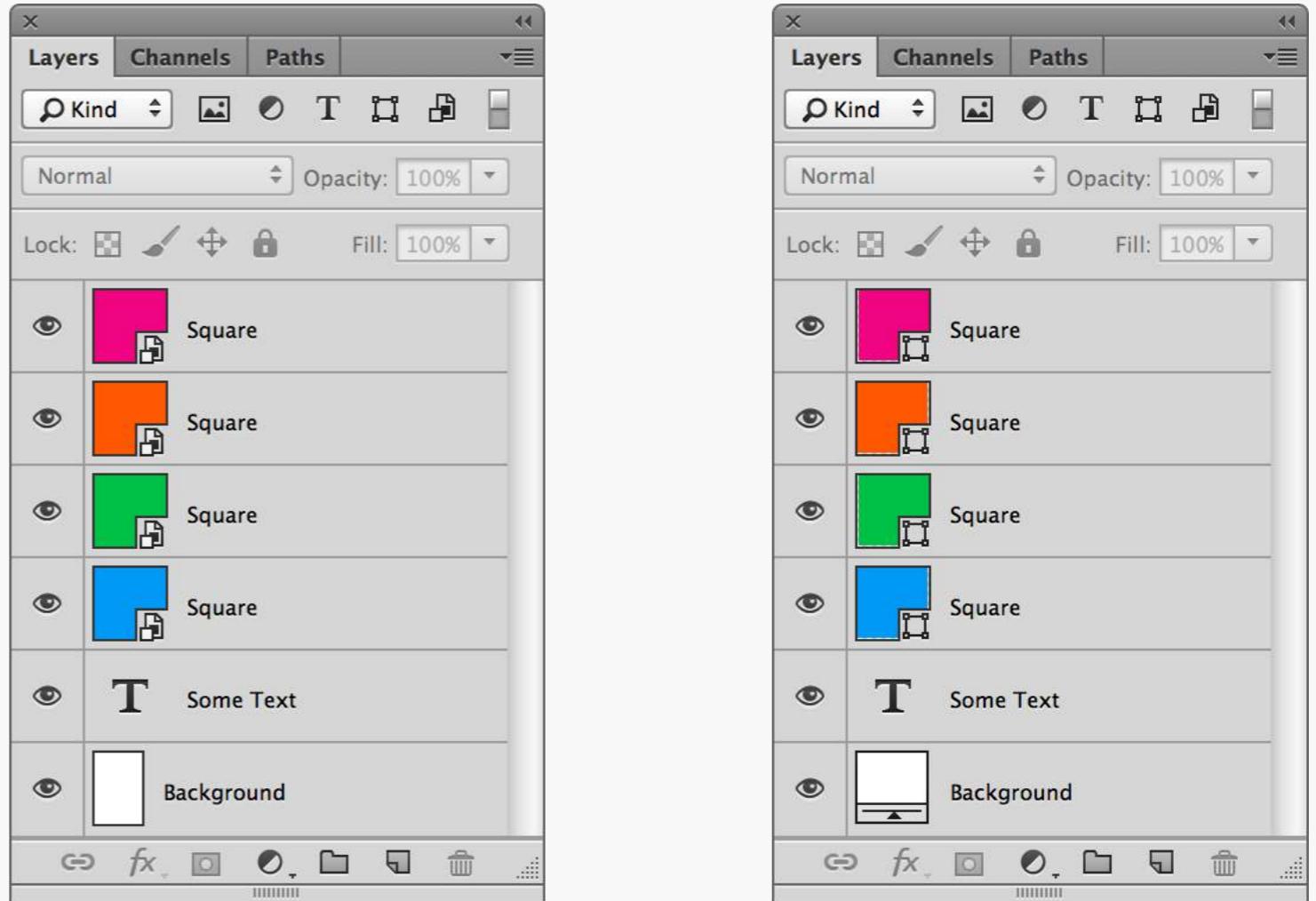
If this utility helps you, please purchase **Classic Color Meter** on the App Store.

Although following the previous advice will give you the correct set up for day-to-day tasks in Adobe products, you may need to take an additional step if you're having trouble with colour values in Apple software like Xcode or Keynote. This is down to the way that OS X

handles profiles. For an in-depth explanation read this article on [OS X Color Meters and Color Space Conversion](#), but the long and short of it, is that you should [download Color Faker](#) and switch it on!

Photoshop

# PIXEL PRECISION



✗ Naughty

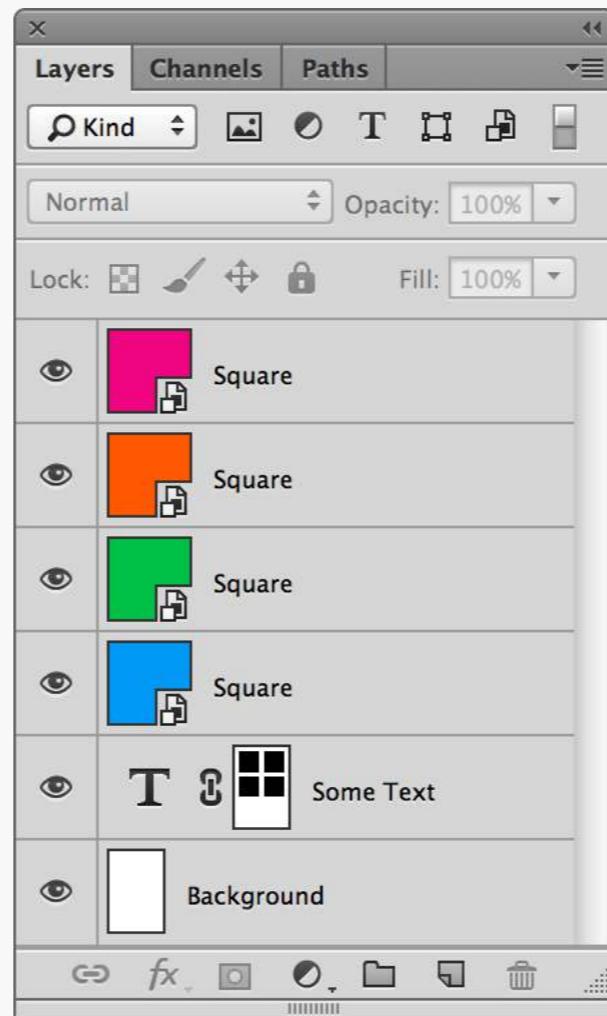
✓ Nice

## Shape Layers

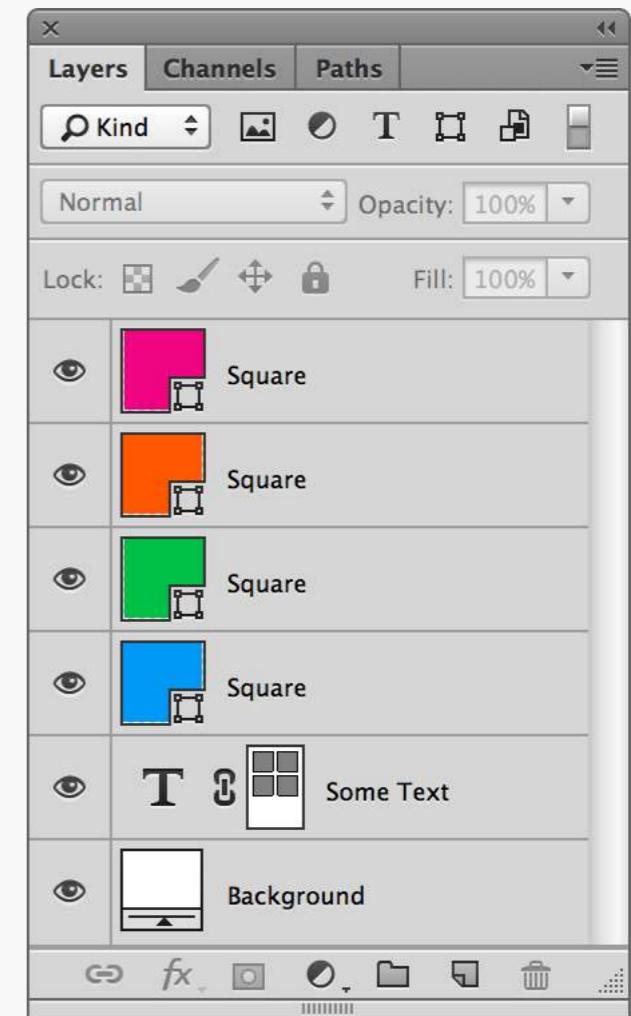
We love Shape Layers here — our workflow is almost entirely based on them. Being vectors, they're completely editable, allow scaling and transformation of the shape with no loss in quality, and are less resource hungry than Smart Objects or bitmaps. Winner.

# Shape Layers Other Vectors

Also, try to use vectors for other parts of your design where you might instinctively use a bitmap, for example layer masks, as this will further increase the versatility and speed of the file. Another related tip is to use unmasked Shape Layers for backgrounds, which have the



✗ Naughty

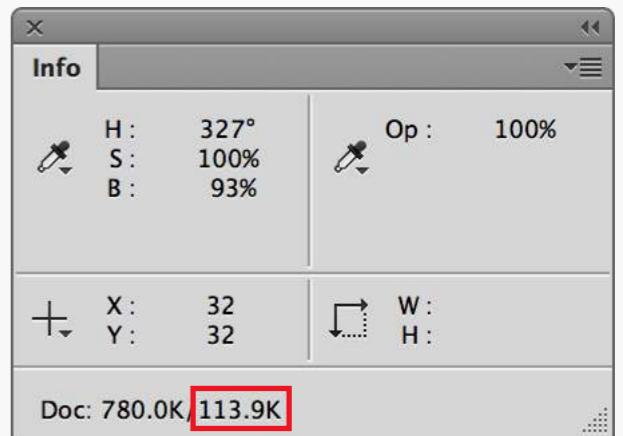
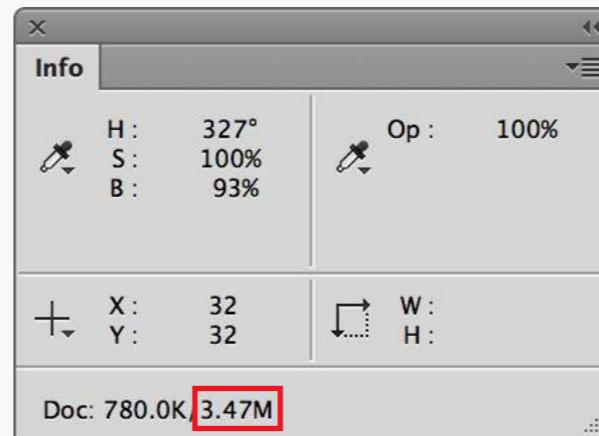


✓ Nice

added advantage that the fill will automatically scale if the canvas size is increased. Nice.

# Shape Layers Performance

As an illustration of the performance hit that bitmaps create, take a look at the two values highlighted above. These are document size readouts for the layers featured on the previous page. The vector design only uses 113.9KB of memory, but the all-bitmap



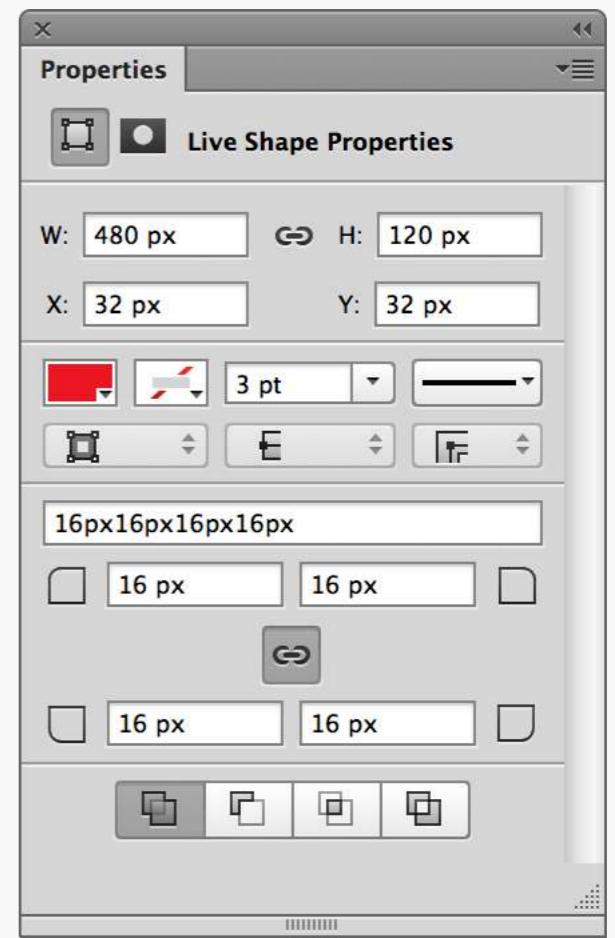
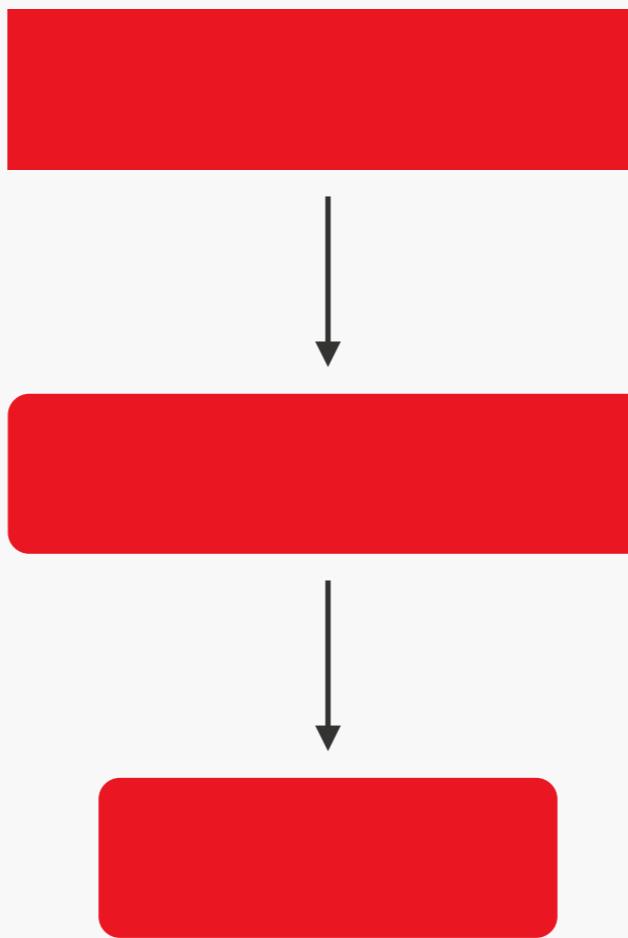
✗ Naughty

✓ Nice

version takes up around five times the amount at 3.47MB! On larger files you can save yourself hundreds of Megabytes of memory.

# Live Shape Properties

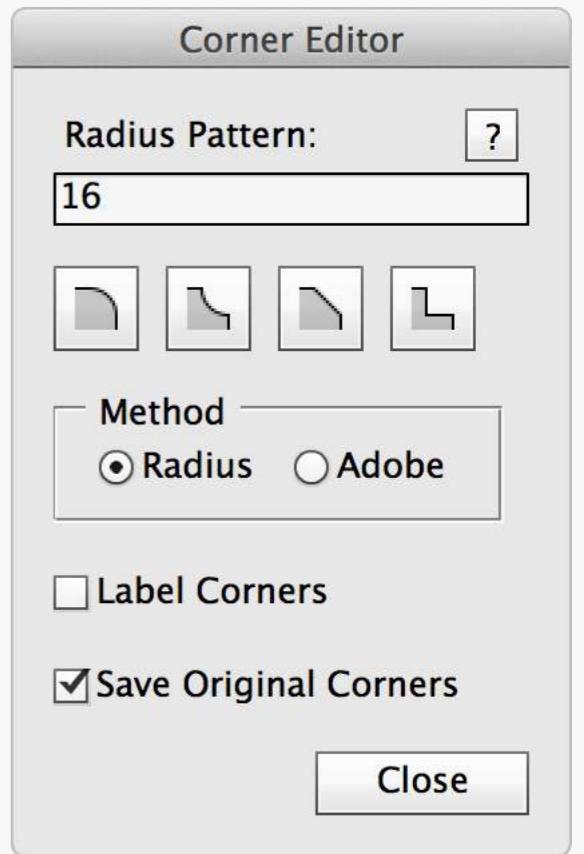
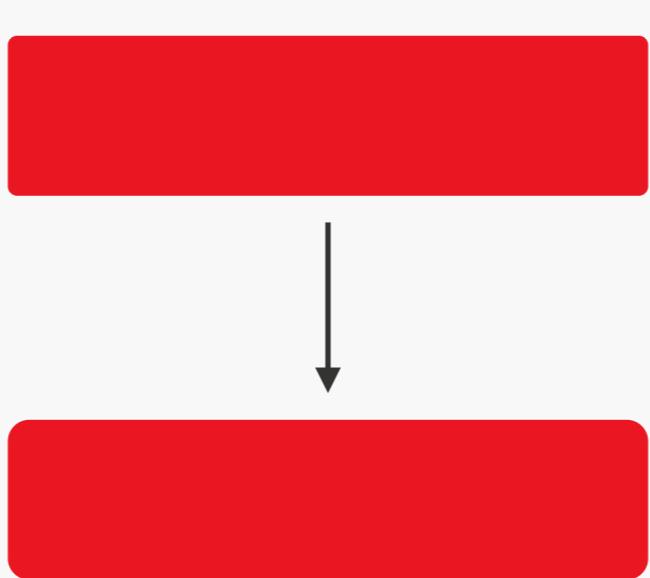
Photoshop CC has an awesome new addition to the Properties panel: Live Shape Properties. Any new Shape Layer now has a set of measurements that can be adjusted after it's been created, which is great for getting pixel perfect dimensions and positions. Need to add



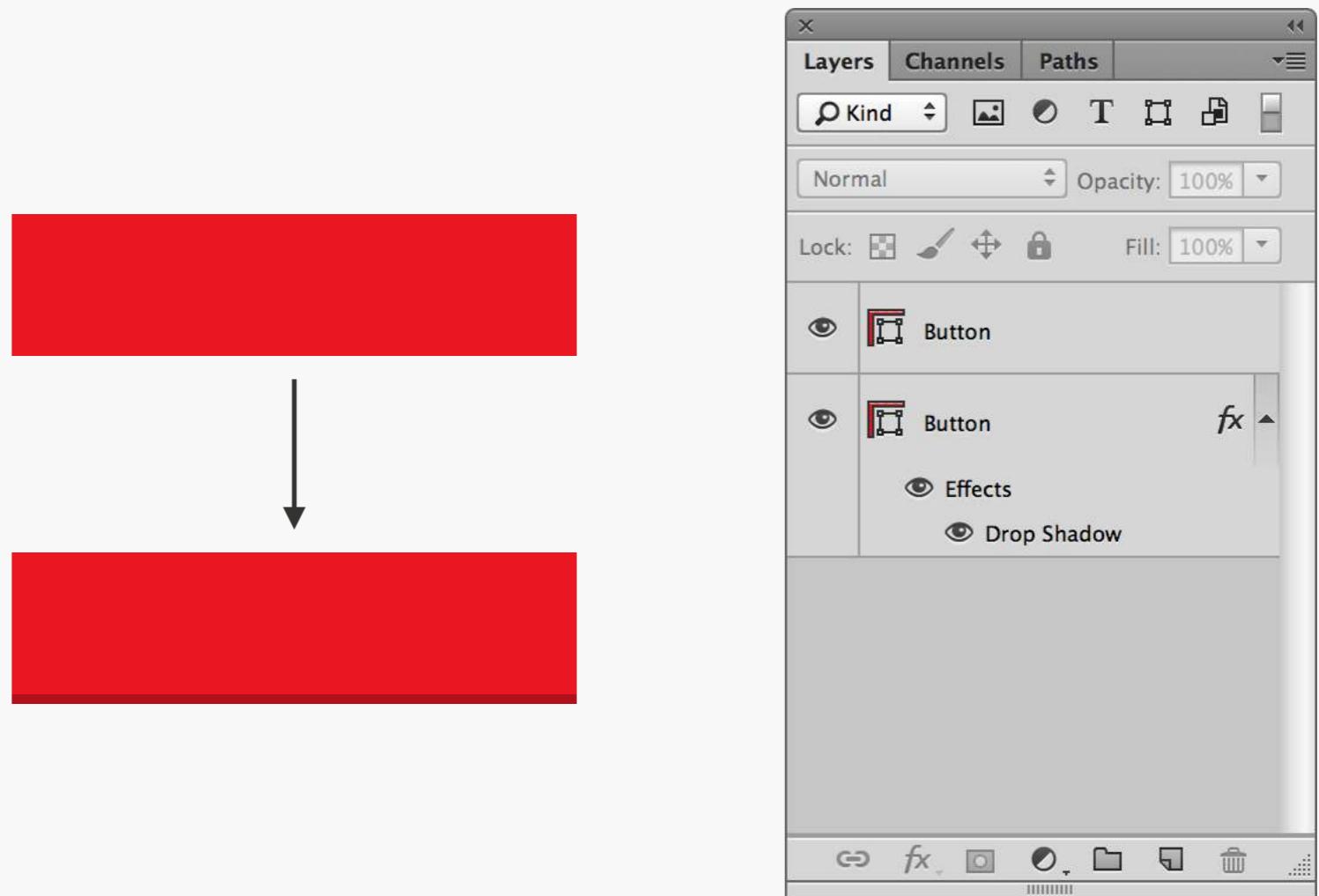
or change one or all of the corner radii? Just select the shape and adjust the values. Also, unlike in previous versions of Photoshop, when you hit transform and resize a shape, the corner radii are now preserved rather than being distorted. Time saved = loads.

# Corner Editor

If you're using a version of Photoshop prior to CC, then there is still a way to edit corner radii after you've drawn a shape: [Corner Editor](#). With it installed, you can select a Shape Layer, bring up the window above from *File > Scripts > Corner Editor*, and change the radii value —



you can even have different sizes for each corner, just like in CC. There's also the option to use different styles, so you're not just limited to rounded corners.

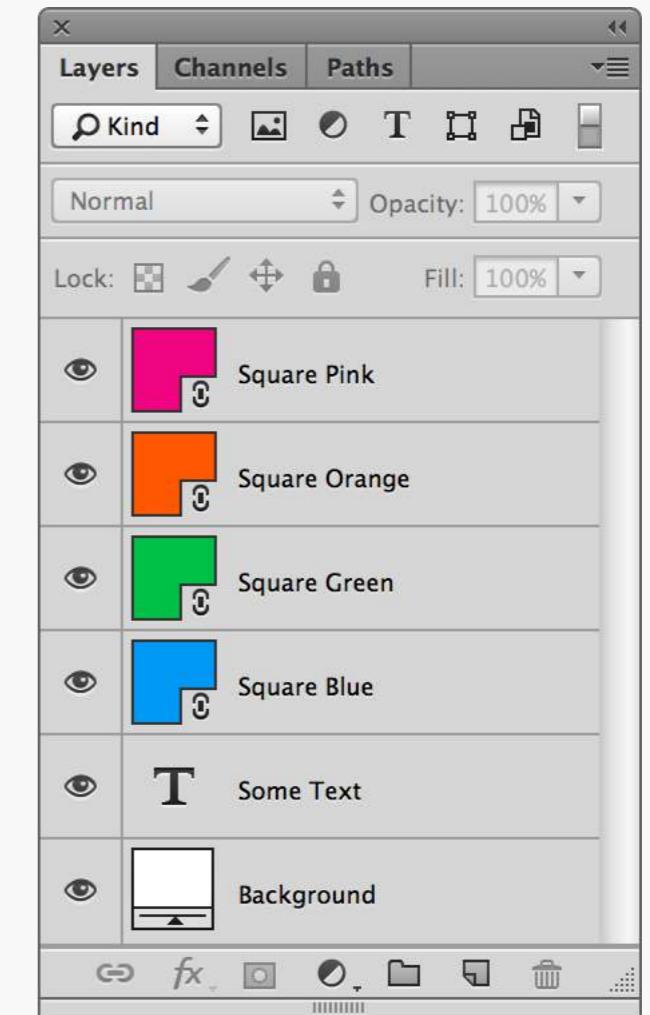


## Layer Effects

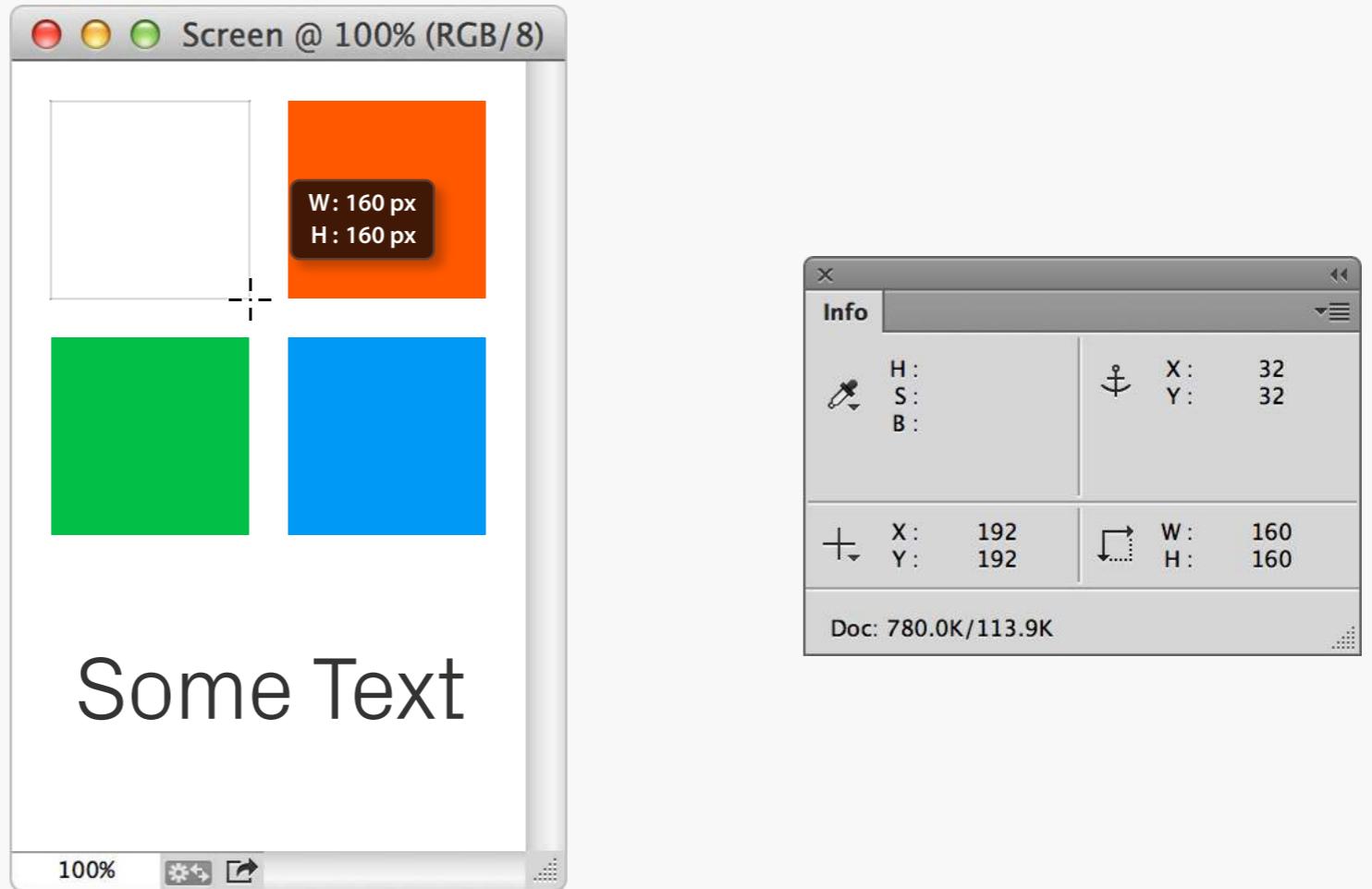
Another thing we love here are Layer Effects, so we try to create as much styling as possible with them. The effects are completely editable, scalable in ratio to their underlying shapes, and can be copied and pasted to other layers.

# Linked Smart Objects

Linked Smart Objects work in a similar way to regular Smart Objects, except that they reference external files for their content. This opens up the potential for a team of designers to use the same common library of interface components across an entire project, with any

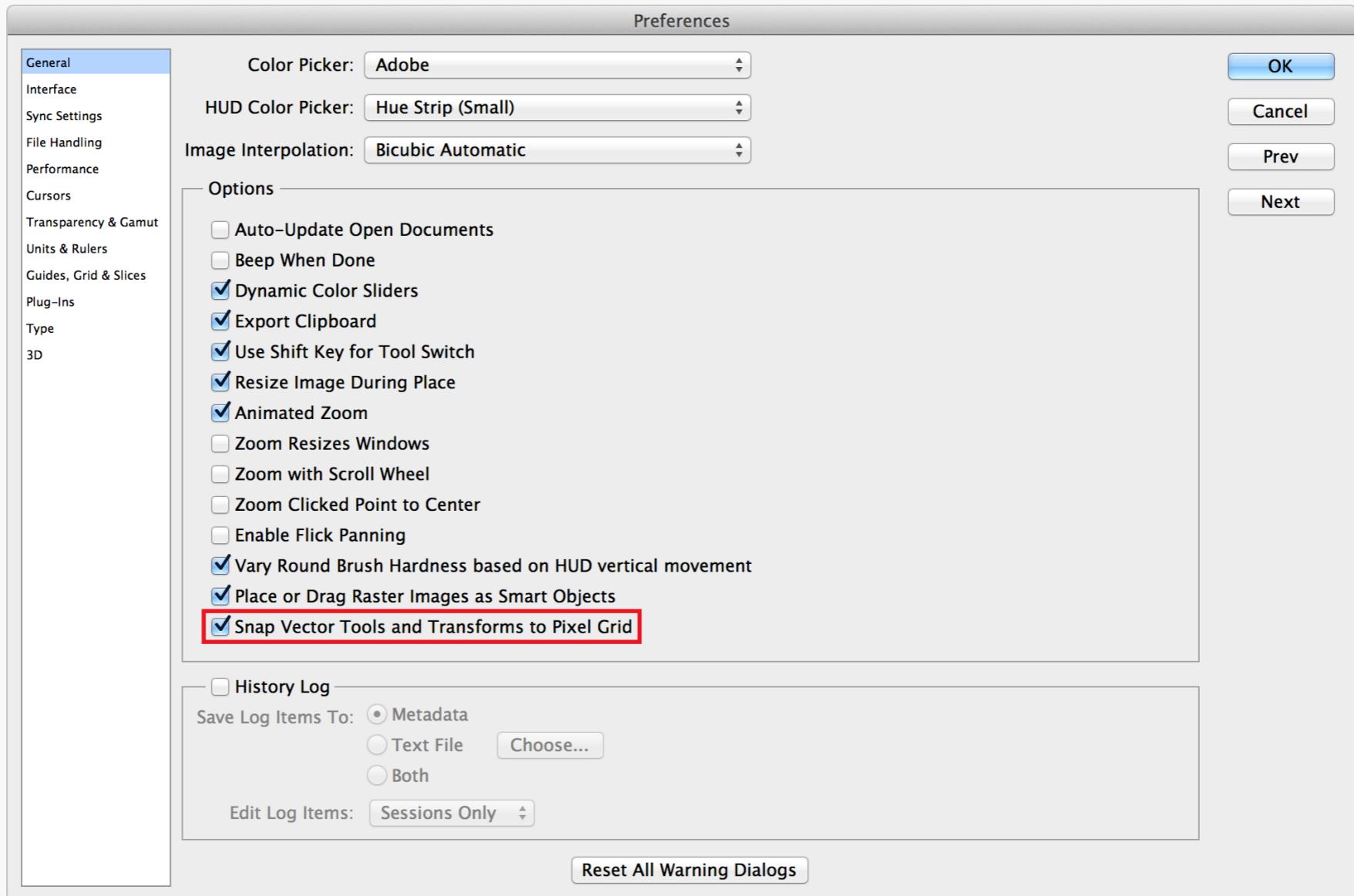


updates to these source files propagating to every design that references them — very powerful. Setting up a Linked Smart Object is dead simple — just choose *Place Linked...* from the *File* menu and select the object you'd like to import.



## Info Panel

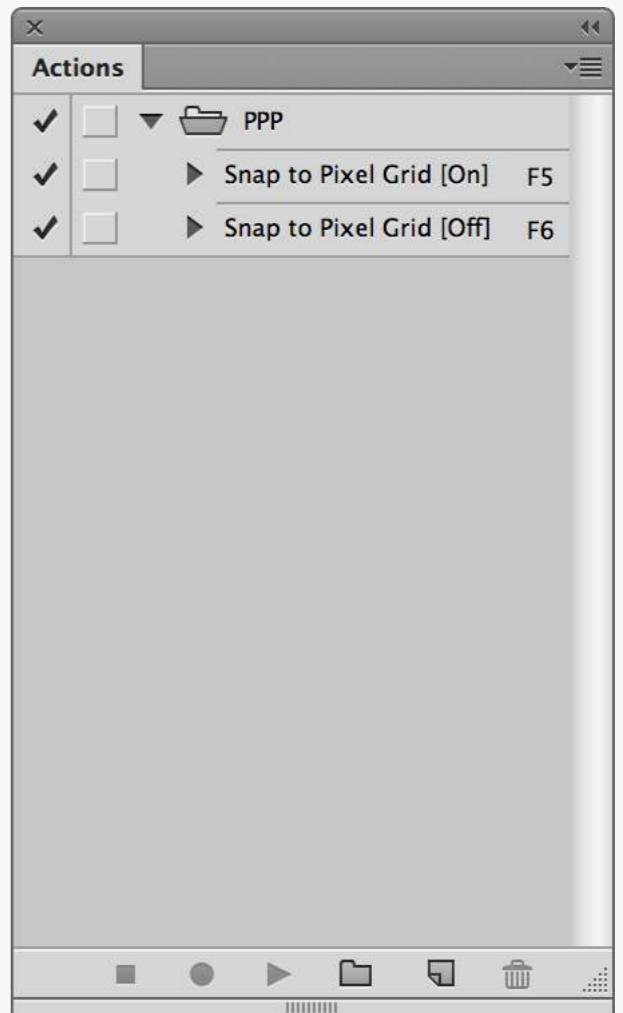
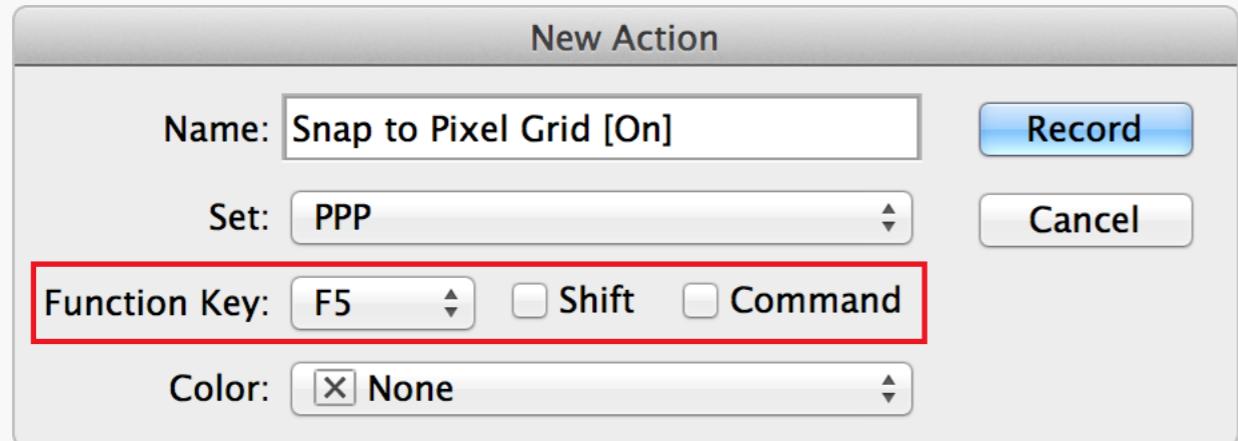
Fire up the Info Panel when the cursor readout just isn't enough. Not only does it show detailed measurements, but it can also be set to display colour and opacity values amongst other things, allowing you to quickly check consistency throughout a design.



## Snap to Pixel Grid

With Photoshop CS6 and above there's a global option to snap vectors to pixels in the Preferences — just make sure *Snap Vector Tools and Transforms to Pixel Grid* is selected (it's on by default). Much easier knowing that

every Shape Layer you draw will automatically be pixel precise.



## Snap to Pixel Grid Shortcuts

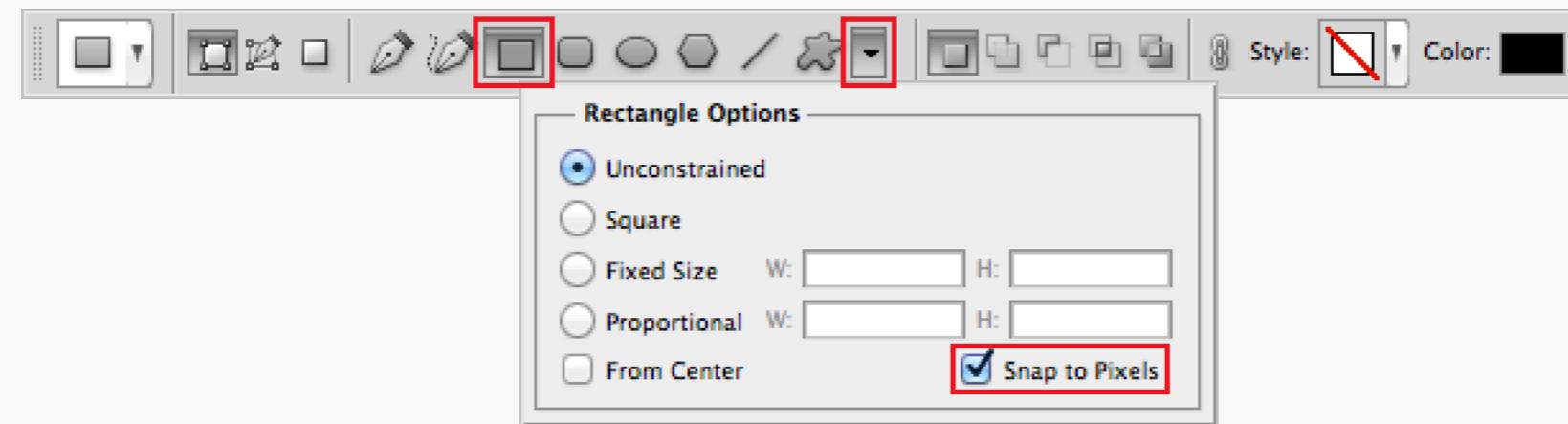
There may be times when you'd like to alter Shape Layers on a sub-pixel level, in which case you won't want pixel snapping activated. If you often find you want to toggle the feature on and off like this, then why not automate the process? Simply create a new Action, assign a

Function Key shortcut to it, hit Record, and then go in to the preferences and switch *Snap Vector Tools and Transforms to Pixel Grid* on. Afterwards follow the same steps for off. No need to hit the Preferences any more.

# Shape Layer Options

In Photoshop CS5 Rectangles and Rounded Rectangles have a built in option to aid pixel precision: *Snap to Pixels*. To access this option click the drop-down menu to the right of the shapes in the top tool bar. This needs to be individually selected for both Rectangle and

Rounded Rectangle, as their options are independent of each other.

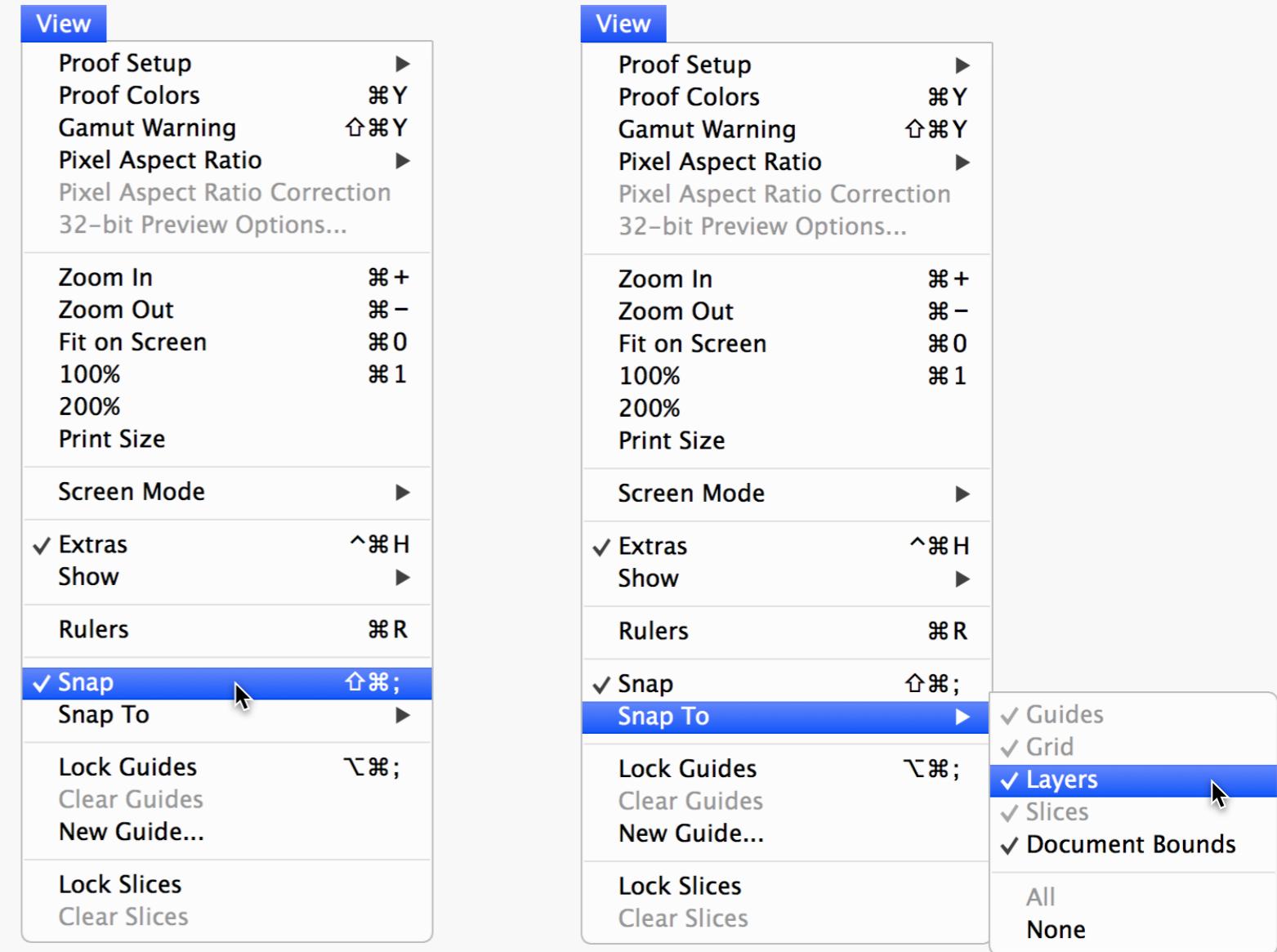


# Nudging

If you're zoomed into a design in Photoshop CS5 be careful when using the keyboard to shift points of a Shape Layer — the nudge amount varies according to the zoom factor. To guarantee a 1px movement, zoom out to 100% and press the arrow key once. If zoomed

in at 200% the points will only move 0.5px (i.e. half the amount), creating blurred edges — not good. With CS6 pixel grid snapping the points move 1px no matter what the zoom level. You'll need to switch off the snap to move by smaller increments though.



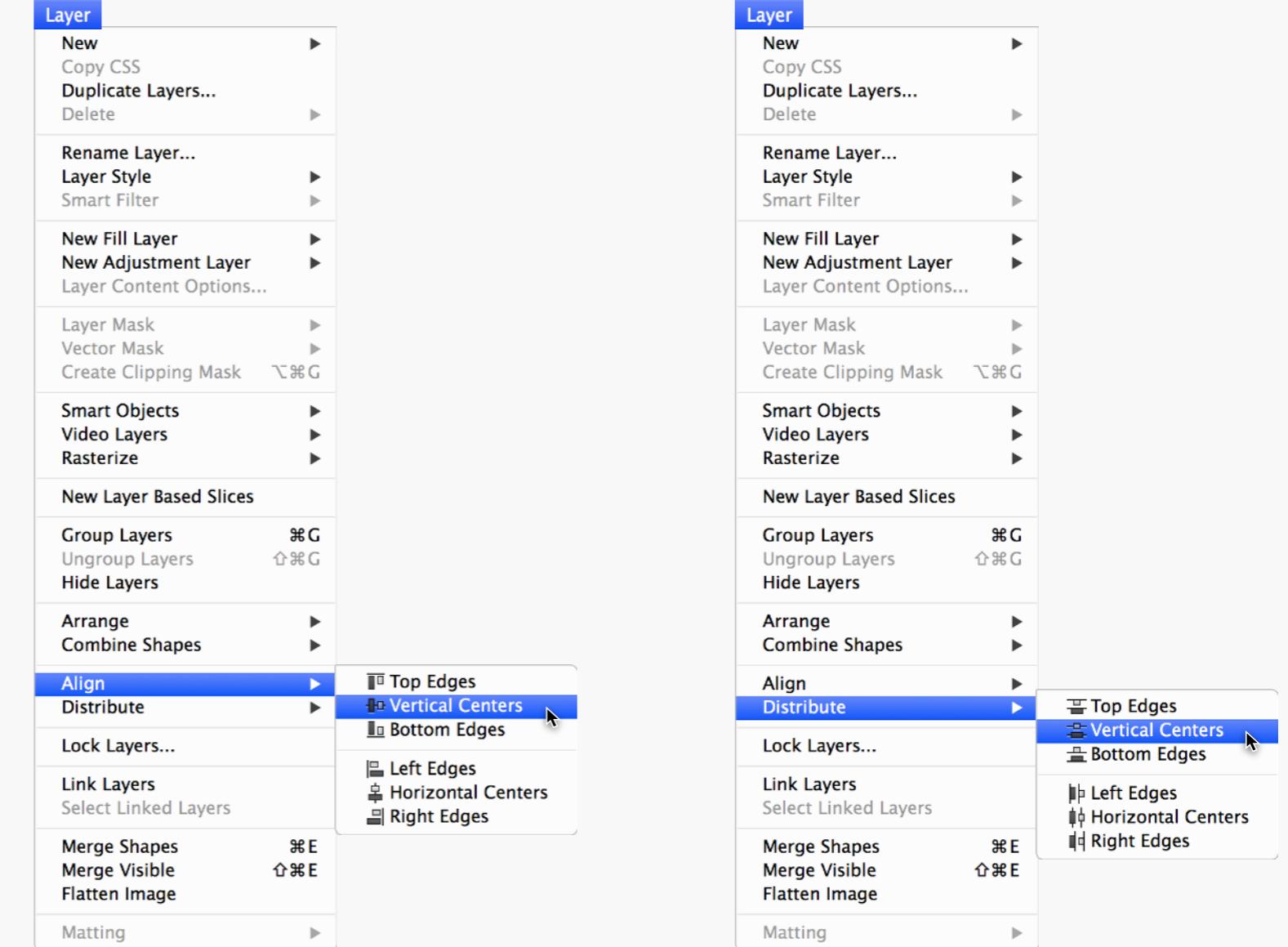


# Snapping

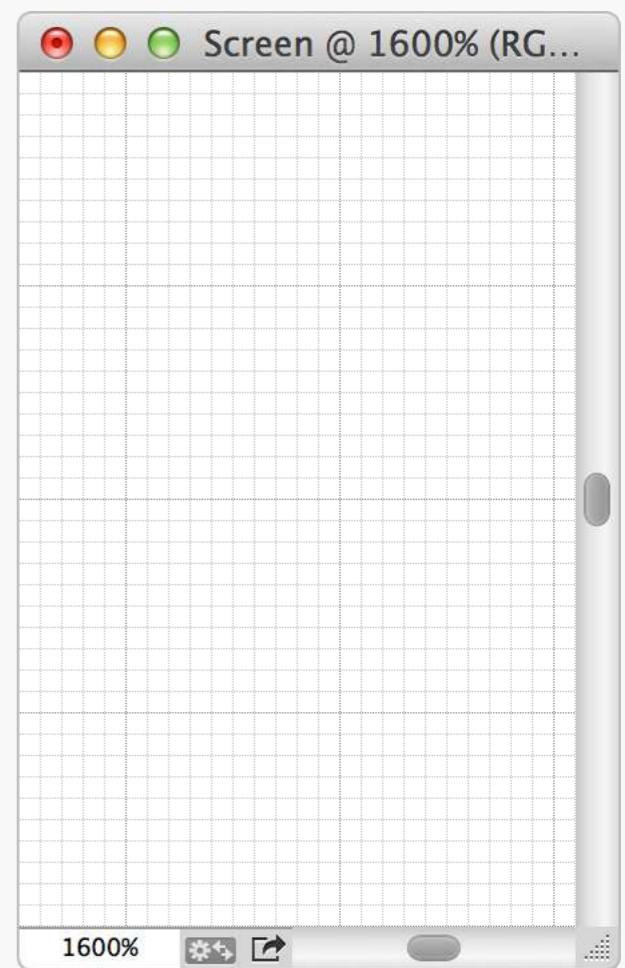
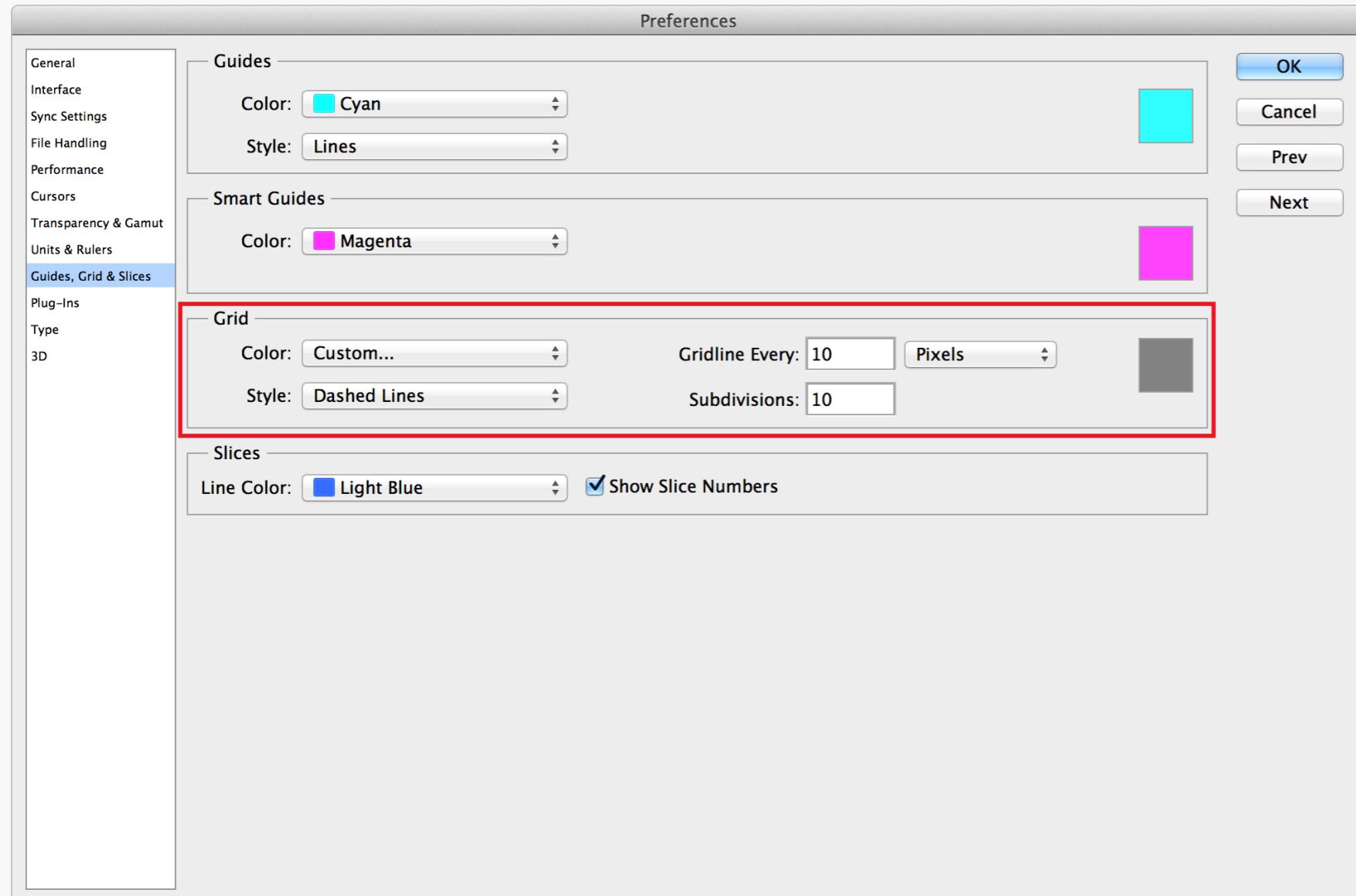
Photoshop has lots of handy tools to help with pixel precision. One of the first things you should do when setting up the program is enable snapping — go to *View > Snap* and make sure it's active. Now your objects will snap to other items and guides on the canvas,

which really helps with alignment. The *Snap To* submenu allows you to alter the various items that Photoshop can use for snapping.

# Align and Distribute



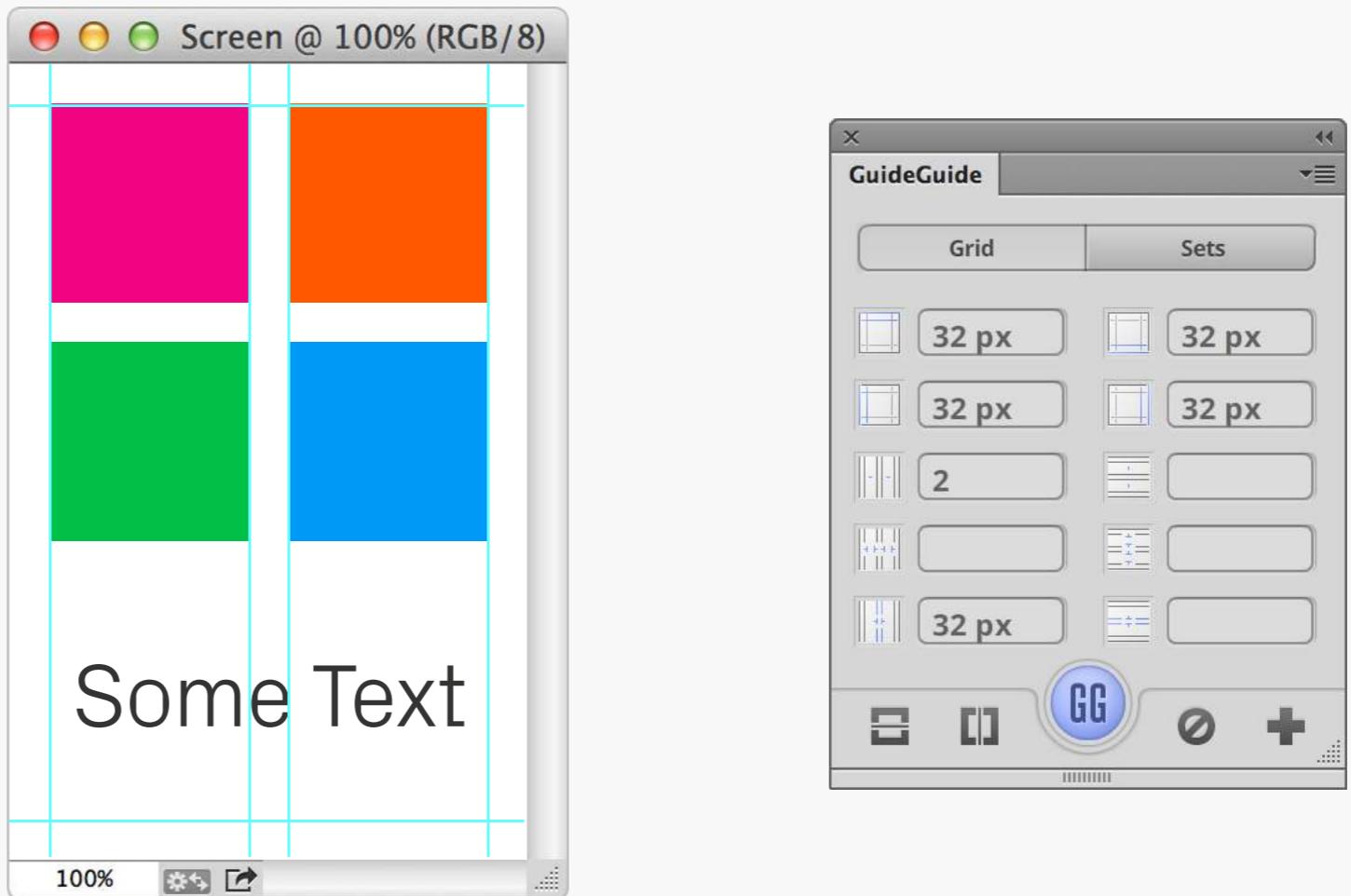
As with most graphics applications, Photoshop has an abundance of align and distribute options — find them in the *Layer > Align* and *Layer > Distribute* menus.



# Grids

Sometimes it's useful to have a grid on screen when laying out a design. The example above is using 10px gridlines with 10 subdivisions, making it easy to count pixel dimensions without the grid becoming overpowering. Go

to *Photoshop > Preferences > Guides, Grid, & Slices...* to set yours up.

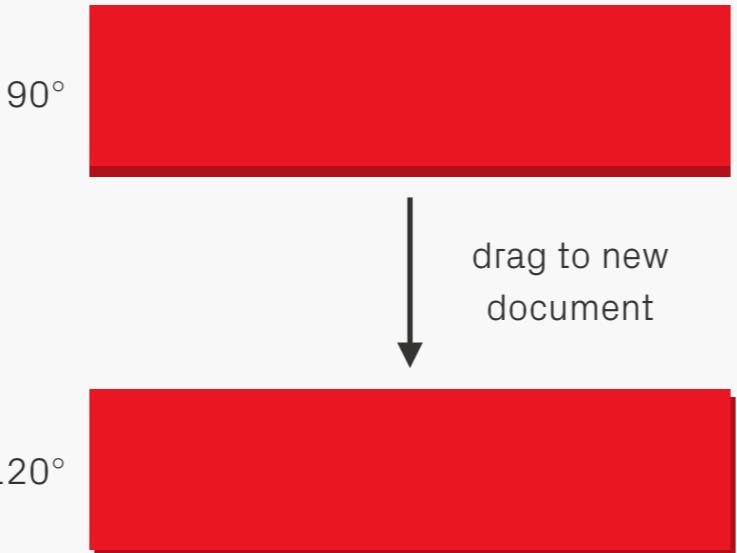


## GuideGuide

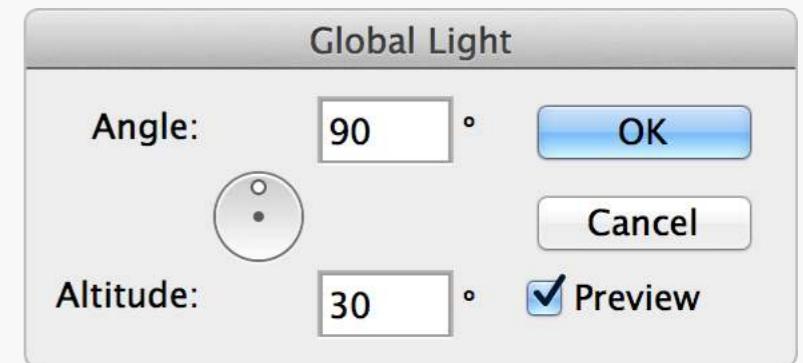
To help automate guide creation, there's a free Photoshop Extension available called [GuideGuide](#). Once installed it can be found in the *Window > Extensions* menu. By varying the data you enter it can work out measurements such as column and gutter

widths, or if you've already sussed these out on a scrap of paper, you can just input all the values and get your guides inserted automatically. There are tooltips for each of the input box icons to let you know what they all do.

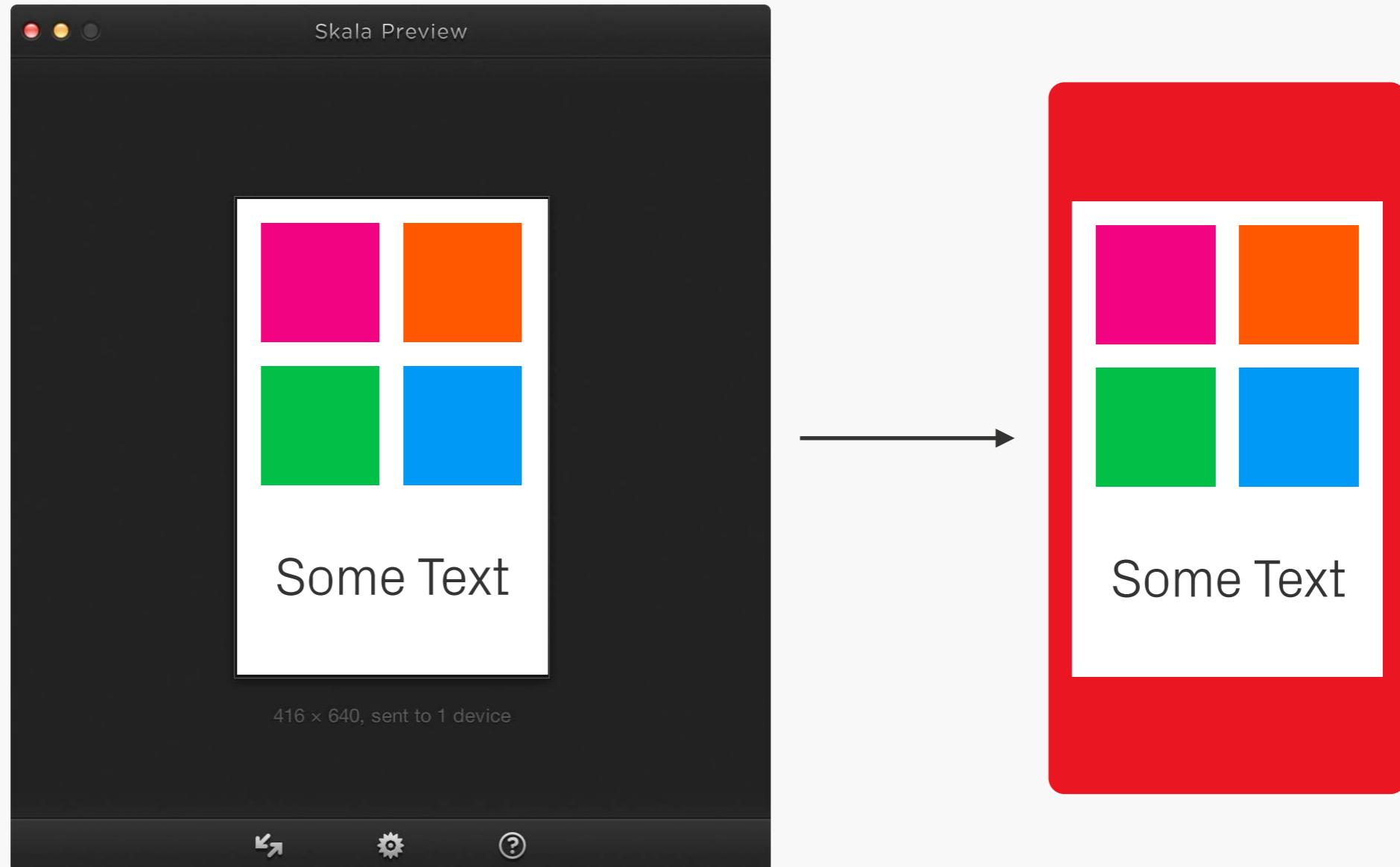
# Global Light Default Angle



This is one of those little things that can catch you out if you're not careful. Objects that have a custom Global Light setting will take on the default value of  $120^\circ$  if they're copied into new documents, which can really mess designs up. To help prevent this from happening too often



close all your open files and go to *Layer > Layer Style > Global Light...* to alter the default angle to something more commonly used —  $90^\circ$  works well for us.



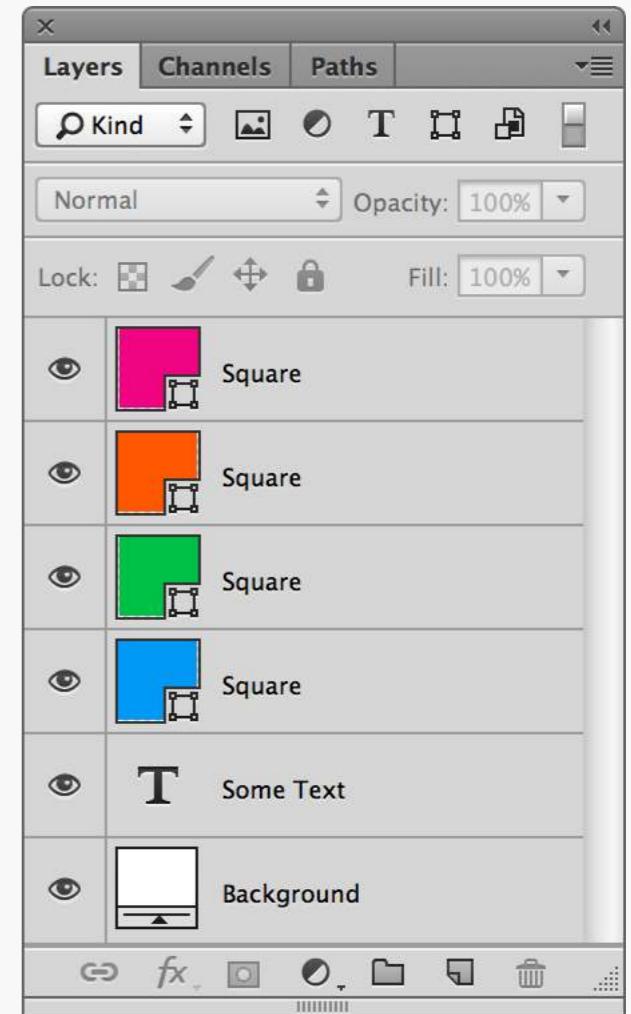
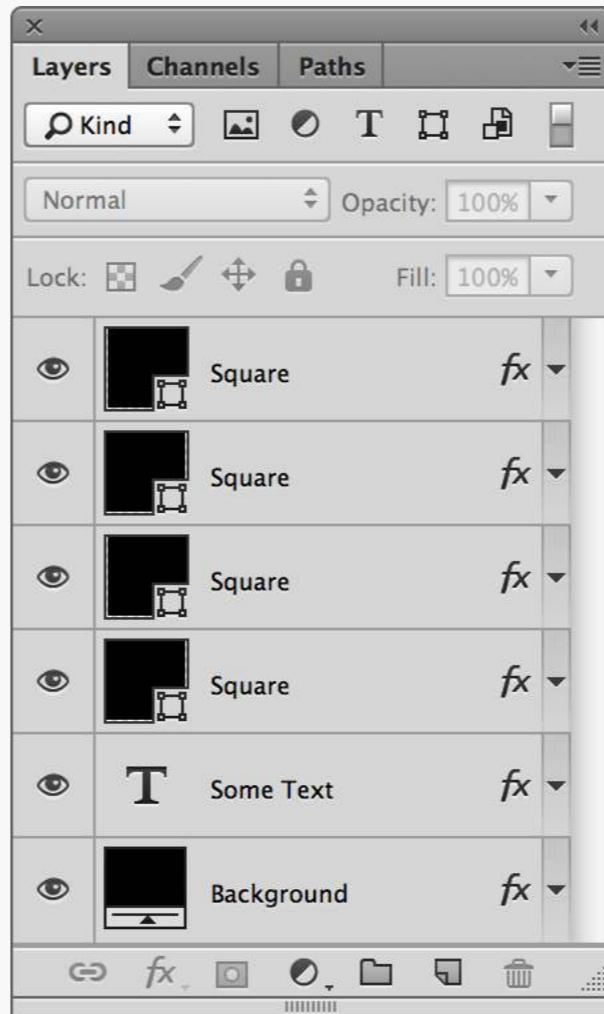
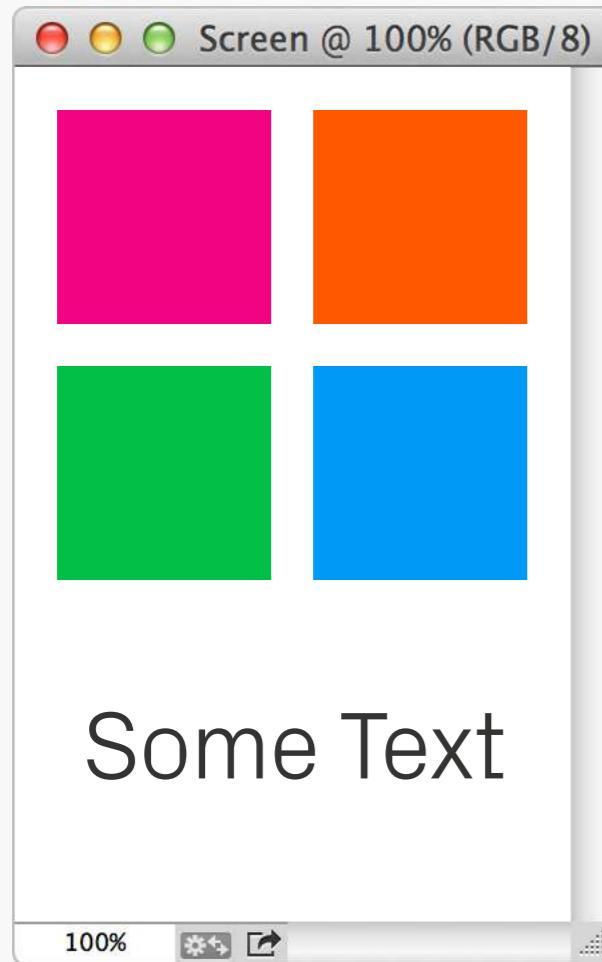
## Live Previewing

Test, test, test again, and then test some more! One of the best things you can do is look at your designs on the device(s) they're intended for. There's lots of software out there which will give a live preview straight out of Photoshop, so there's no need to faff around

saving out files and then copying them across to a phone. A couple worth checking out are [Skala Preview](#) for iOS (and now Android) and [Android Design Preview](#) for... well you can guess that one!

Photoshop

# TECHNIQUES



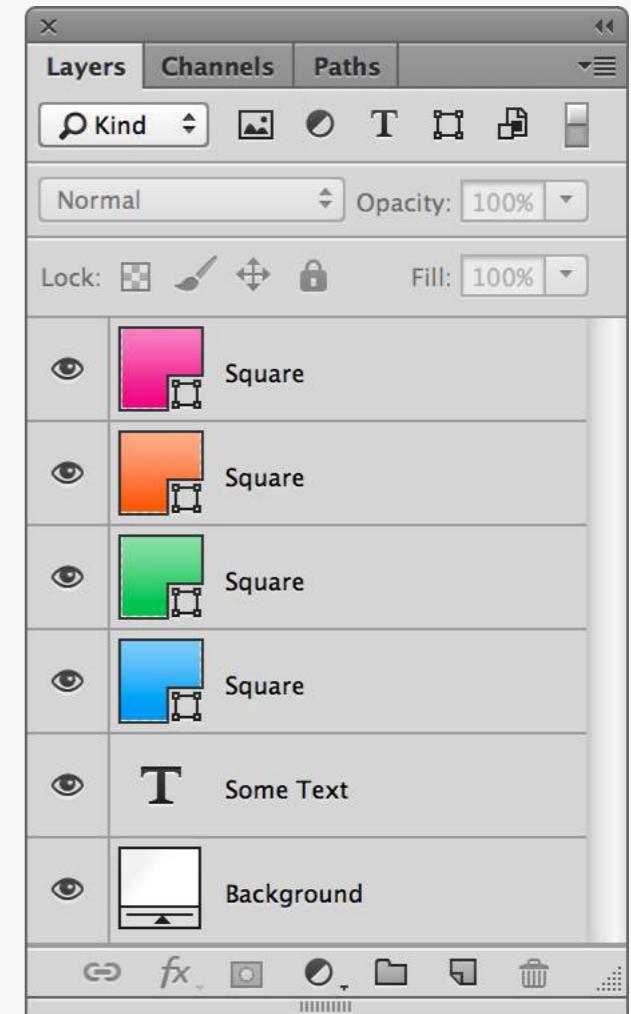
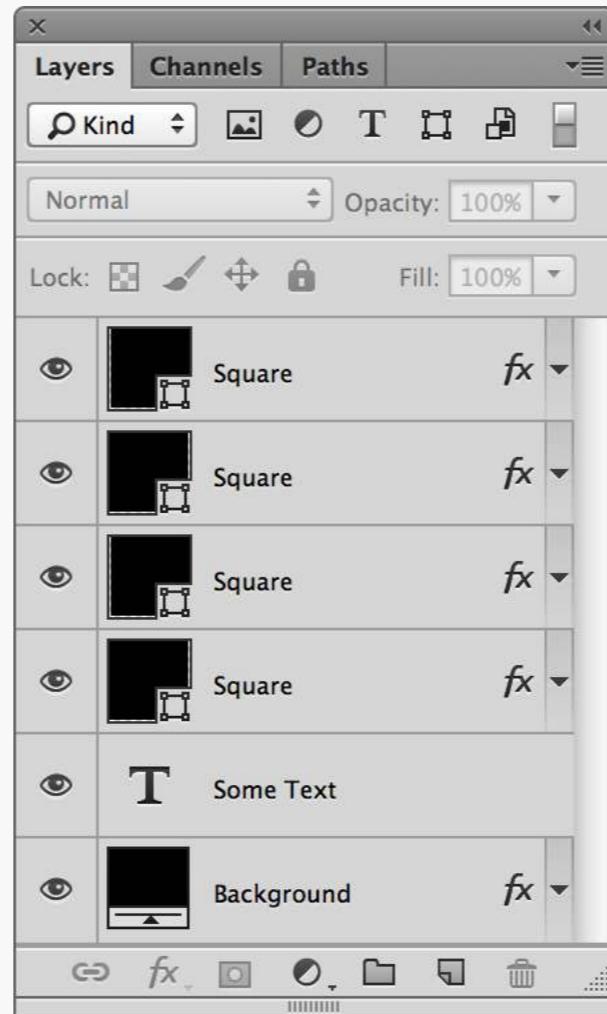
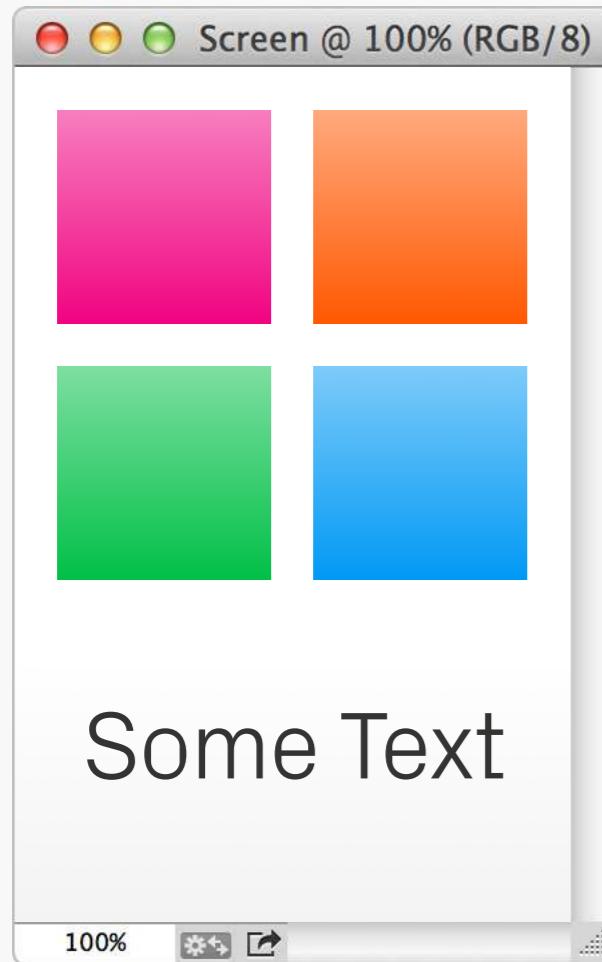
✗ Naughty

✓ Nice

## Object Colours

With Shape Layers and text it's a good idea to change the colour using the object's own setting, instead of the *Color Overlay* Layer Effect. The benefits of this are a) there's no need to load up the Layer Style window if you want to change the colour, and b) it makes the

object easier to find in the Layers panel. As an example, how quickly can you locate the blue square in each of the examples above?

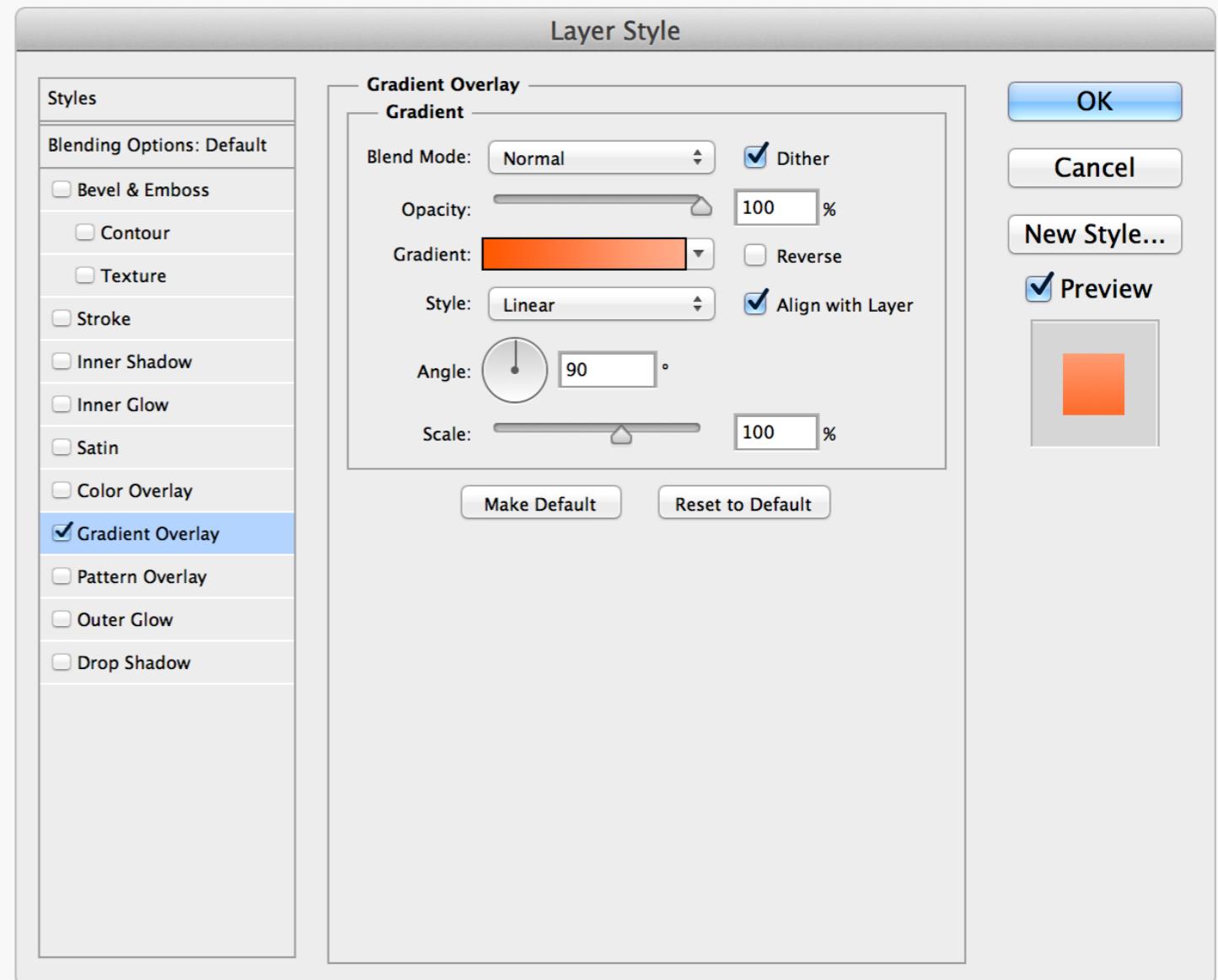
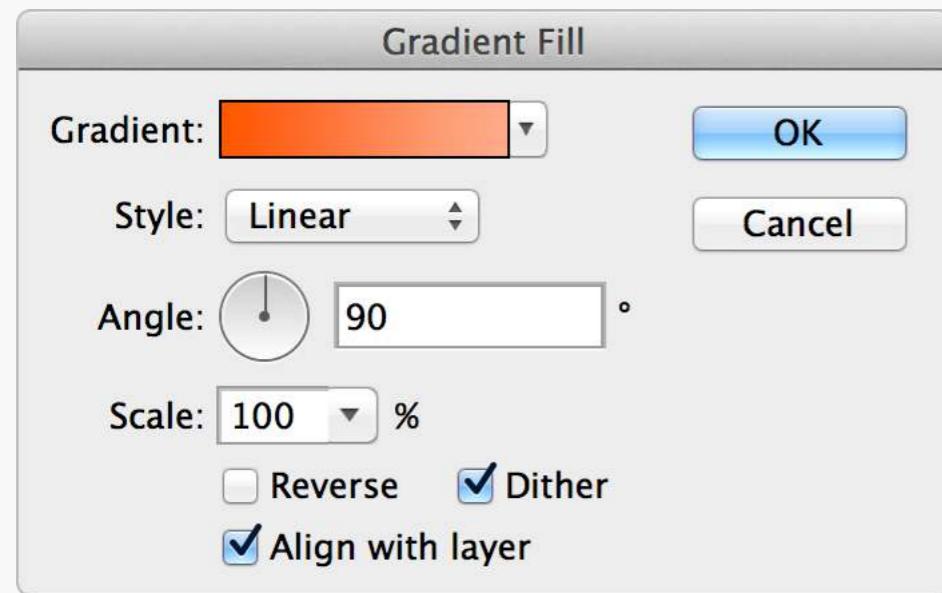


✗ Naughty

✓ Nice

## Object Gradients

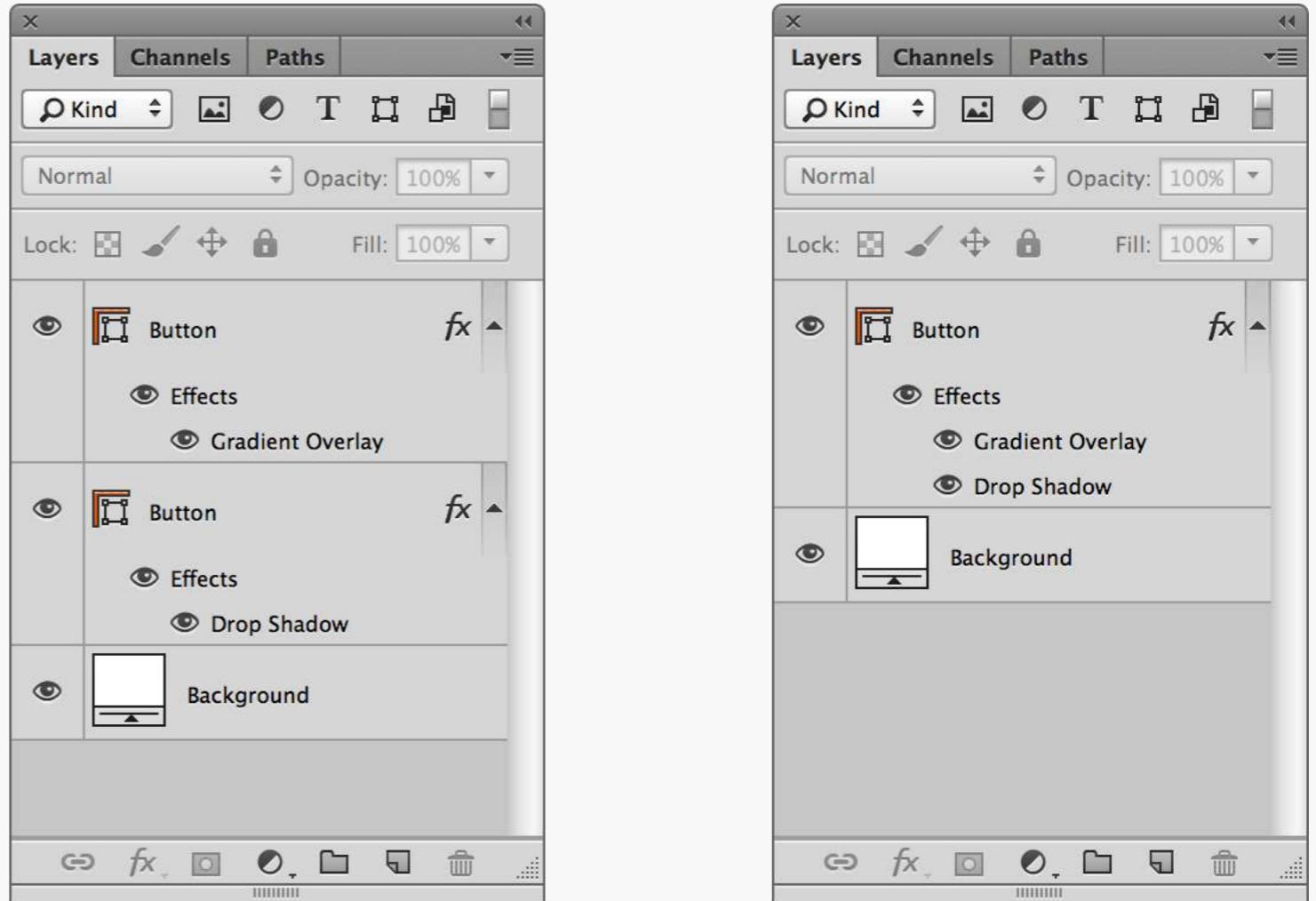
Same thing with gradients — use a gradient fill layer instead of a Layer Effect if possible.



## Object Gradients

### Dither

Whichever gradient method you choose, make sure the *Dither* option is selected. This will help smooth out the colour transition and prevent any banding. With Photoshop CS5 you can only apply a dither to a gradient layer, but in CS6 and above it's possible for both.

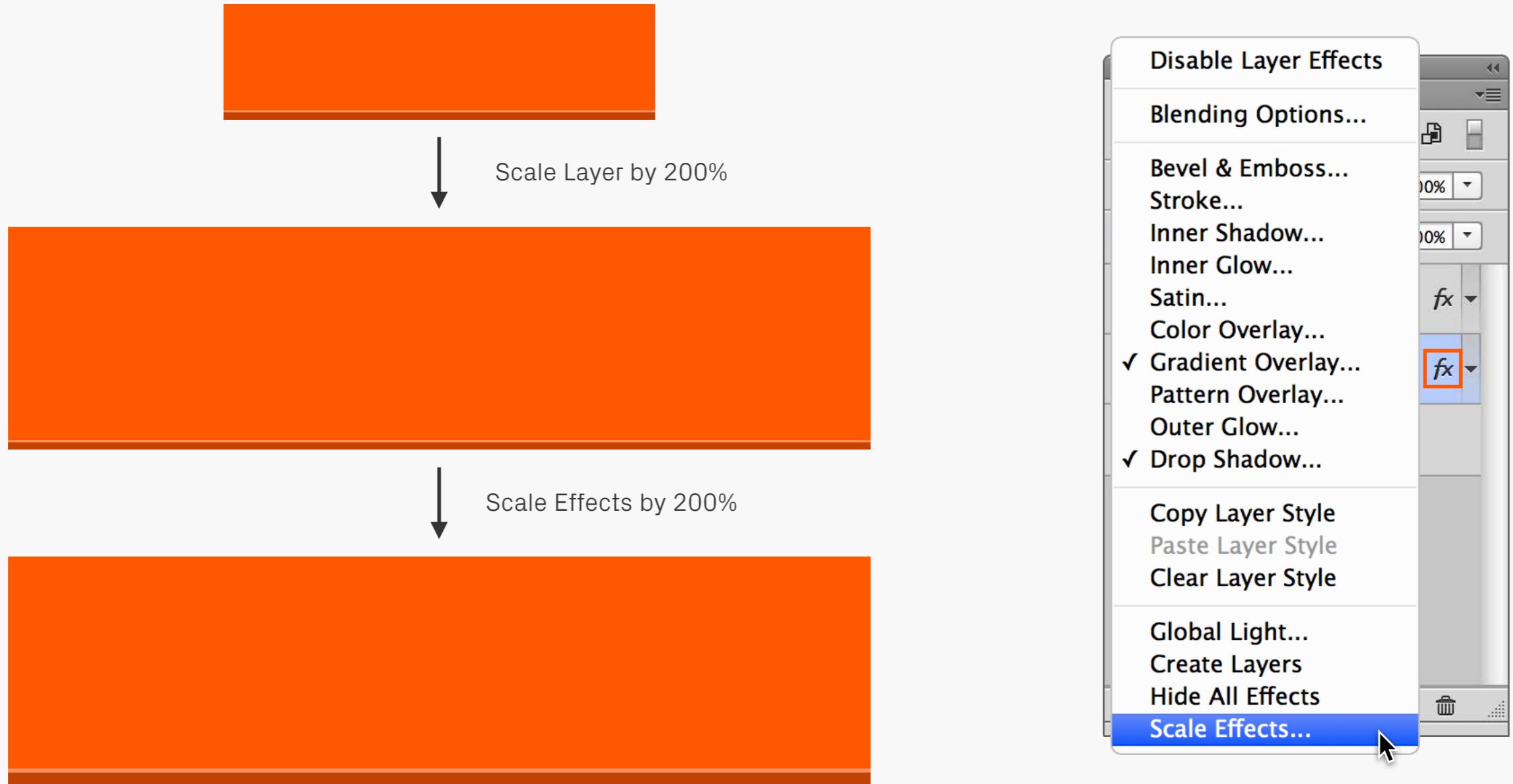


**✗ Naughty**

**✓ Nice**

## Concise Layer Styles

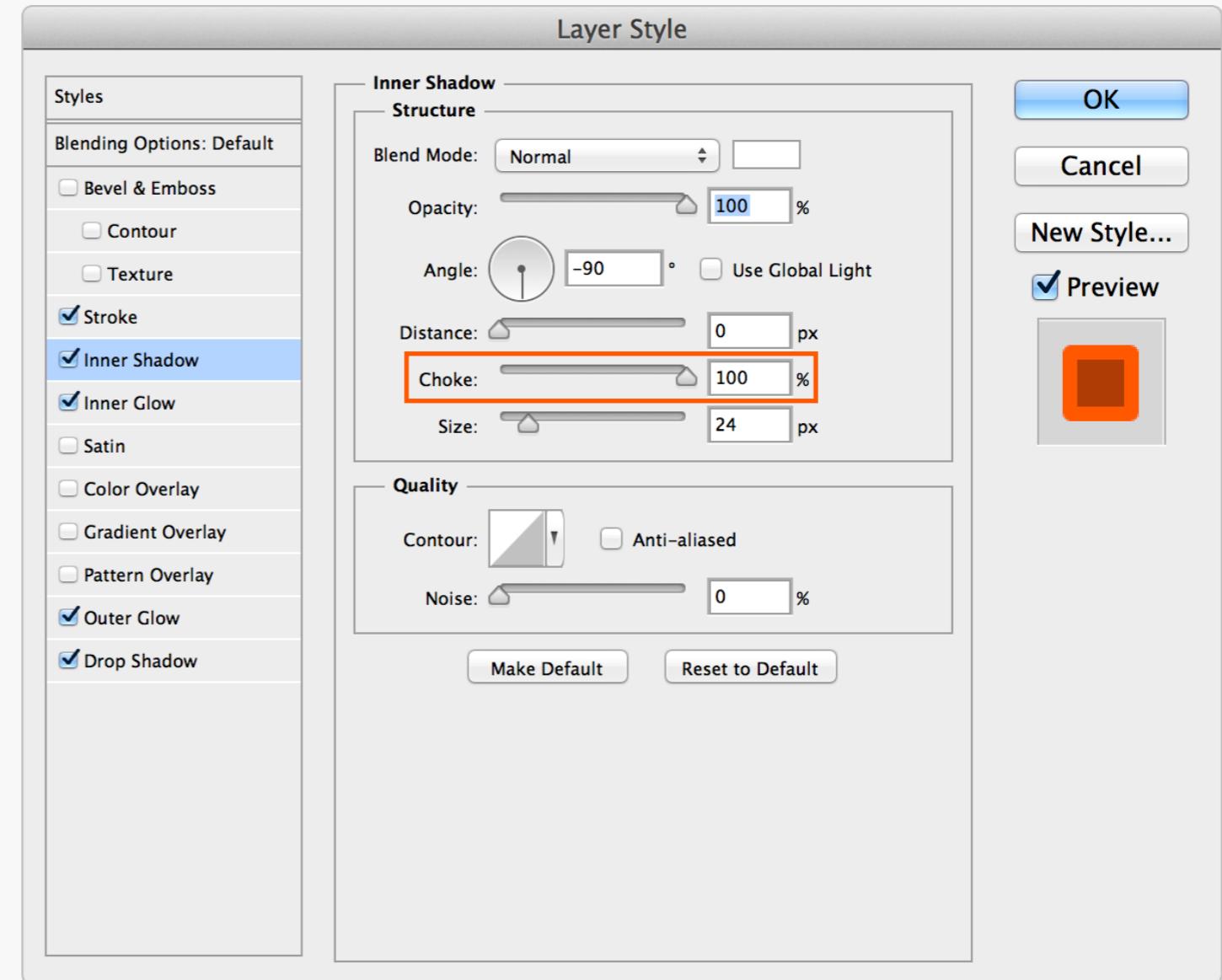
Try not to spread the Layer Effects for an object across multiple layers. It's much better if they're all together, as it keeps things tidy and makes it easier to copy and paste styles.



# Scale Layer Effects

Although you can choose the *Scale Styles* option when you resize an entire document through *Image Size...* there are times when you want to scale individual layers and their effects. When you resize one of these objects, the styling doesn't automatically adjust with it,

but you can use the *Scale Effects...* option to change them as well — although you'll need to know the percentage increase/decrease of the original shape to get the two to match. This option can be found by right-clicking the *fx* icon on the layer in question.

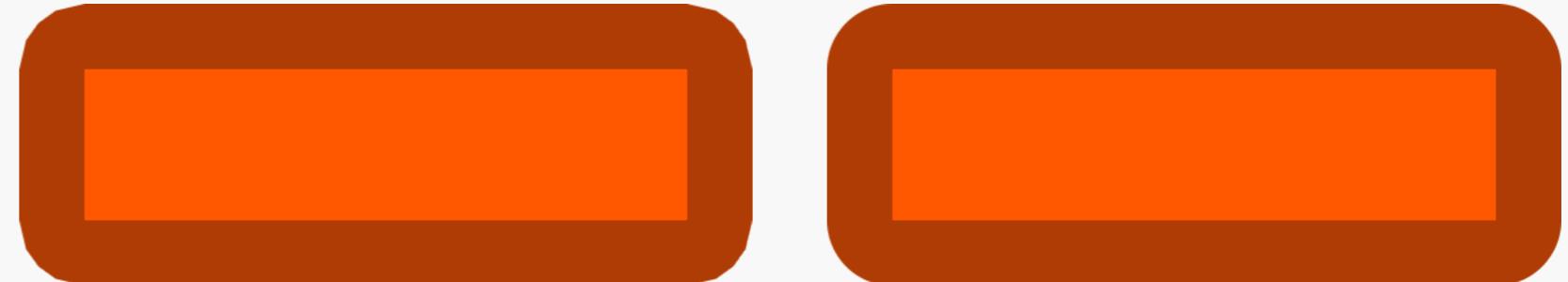


## Layer Effect Strokes

At first glance it may seem that the only way to create a stroke with Layer Effects is the *Stroke* option, but in fact there are multiple ways to add them to a shape. If you use the *Inner*, *Outer Glow*s and *Shadows*, and set their *Choke* to 100%, you can also get solid

outlines. The *Stroke* will always appear on top, followed by *Inner Shadow* and *Inner Glow* on the inside, likewise *Outer Glow* and *Drop Shadow* on the outside. Downsides? At thicker widths they can blur, and the *Choke* can cause roughness on rounded edges.

# Layer Effect vs. Vector Strokes

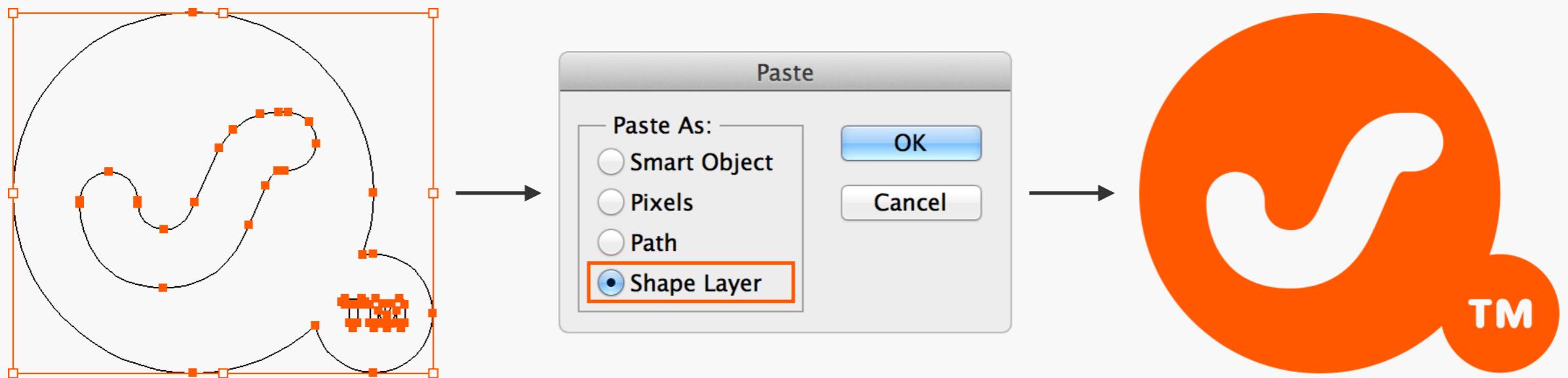


✗ Naughty

✓ Nice

If you want top quality outlines, and have Photoshop CS6 or above, then add a vector stroke directly to your Shape Layer rather than as a Layer Effect. Not only are they better quality (more noticeable at thicker widths), but you have the option to use rounded, square, or

bevelled edges, as well as dashed outlines. They can also be scaled to half pixels, which is really useful if you're designing for iOS, as you can set a non-Retina stroke to 0.5px which will then scale up to 1px when the size is doubled to Retina.



## Complex Vectors

If you want to draw complex vectors, it's often easier to use Illustrator than copy and paste the outline into Photoshop as a Shape Layer. Make sure you outline any strokes in the Illustrator original, otherwise they won't import properly. Remember by reciting this phrase to

yourself: "Don't be a joke, outline the stroke". If the vector is more than just a shape, for example a multi-colour desktop icon, then it will have to be pasted as a Smart Object.

# Pasting From Illustrator

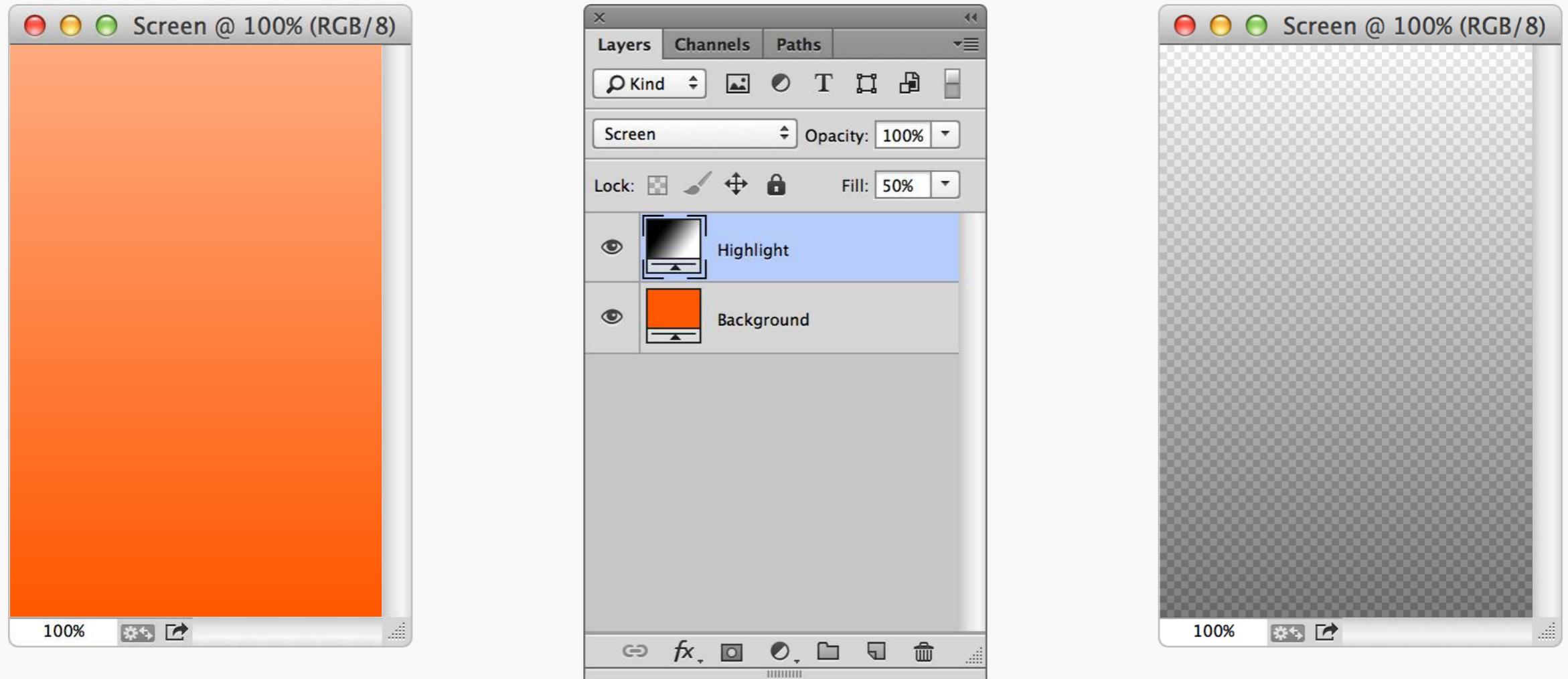
One quirk of pasting Shape Layers from Illustrator is that it can sometimes shift the object off-centre by half a pixel in either or both axes, resulting in blurred edges — although with CS6 onwards and pixel snapping this seems to be less of an issue.



✗ Naughty

✓ Nice

Always check to see if this has happened, and if it has, shift the shape back by half a pixel to its intended position.

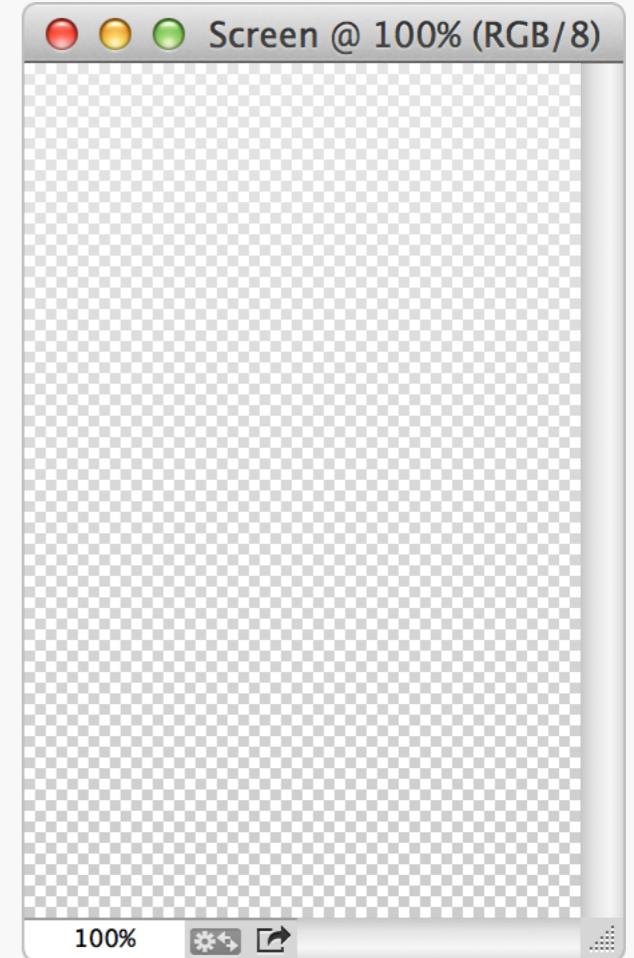
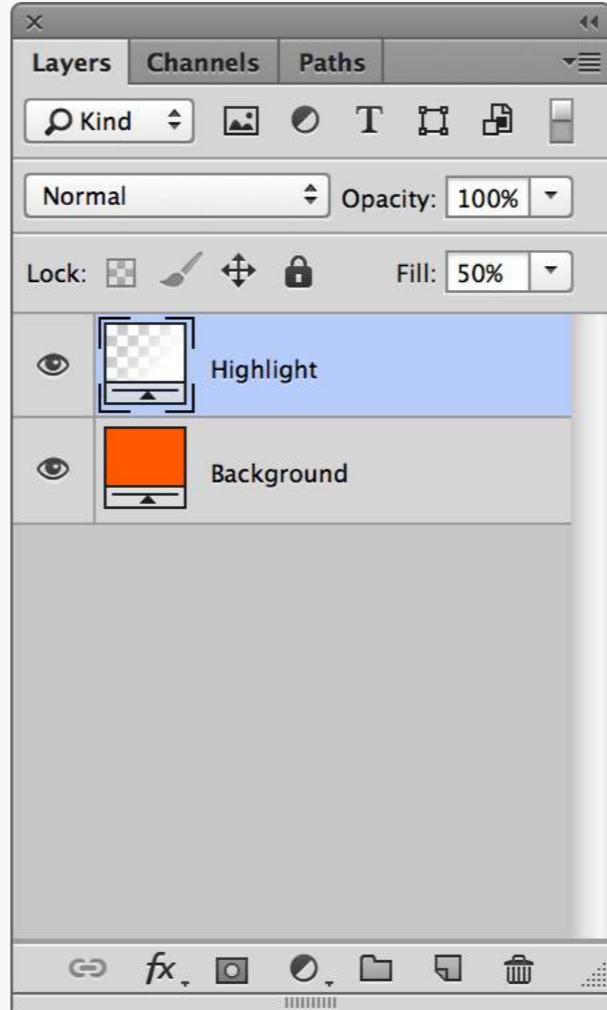


## ✗ Naughty

# Blending Modes

When creating effects remember to only use blending modes on items which will later be merged with other layers. In the example above the *Highlight* layer will be exported as a separate asset, but when shown on its own,

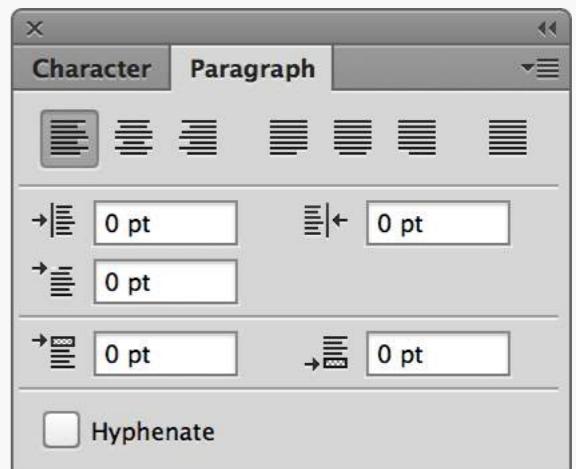
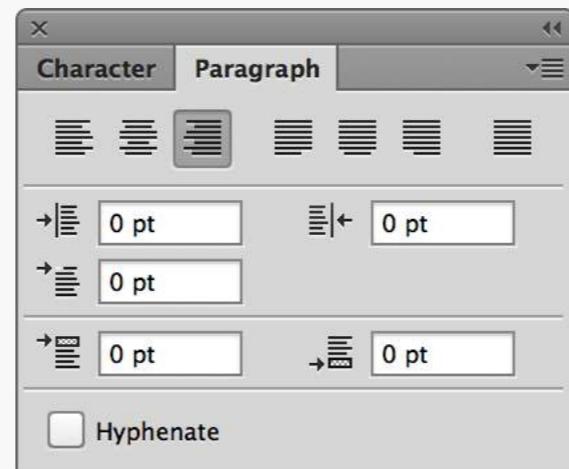
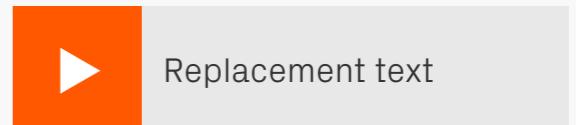
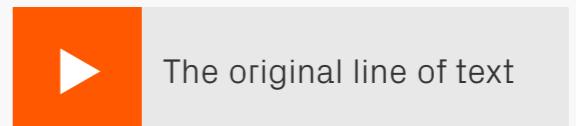
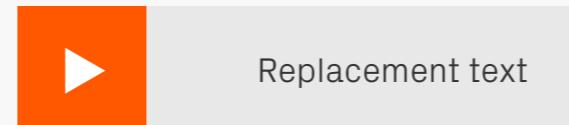
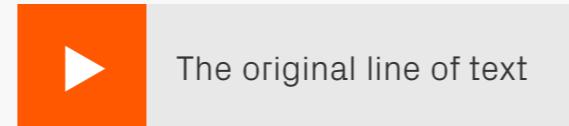
the blending effect disappears and it becomes a white to black gradient.



✓ Nice

## Blending Modes

The best solution is to recreate the effect using a layer that's independent of what's underneath it.

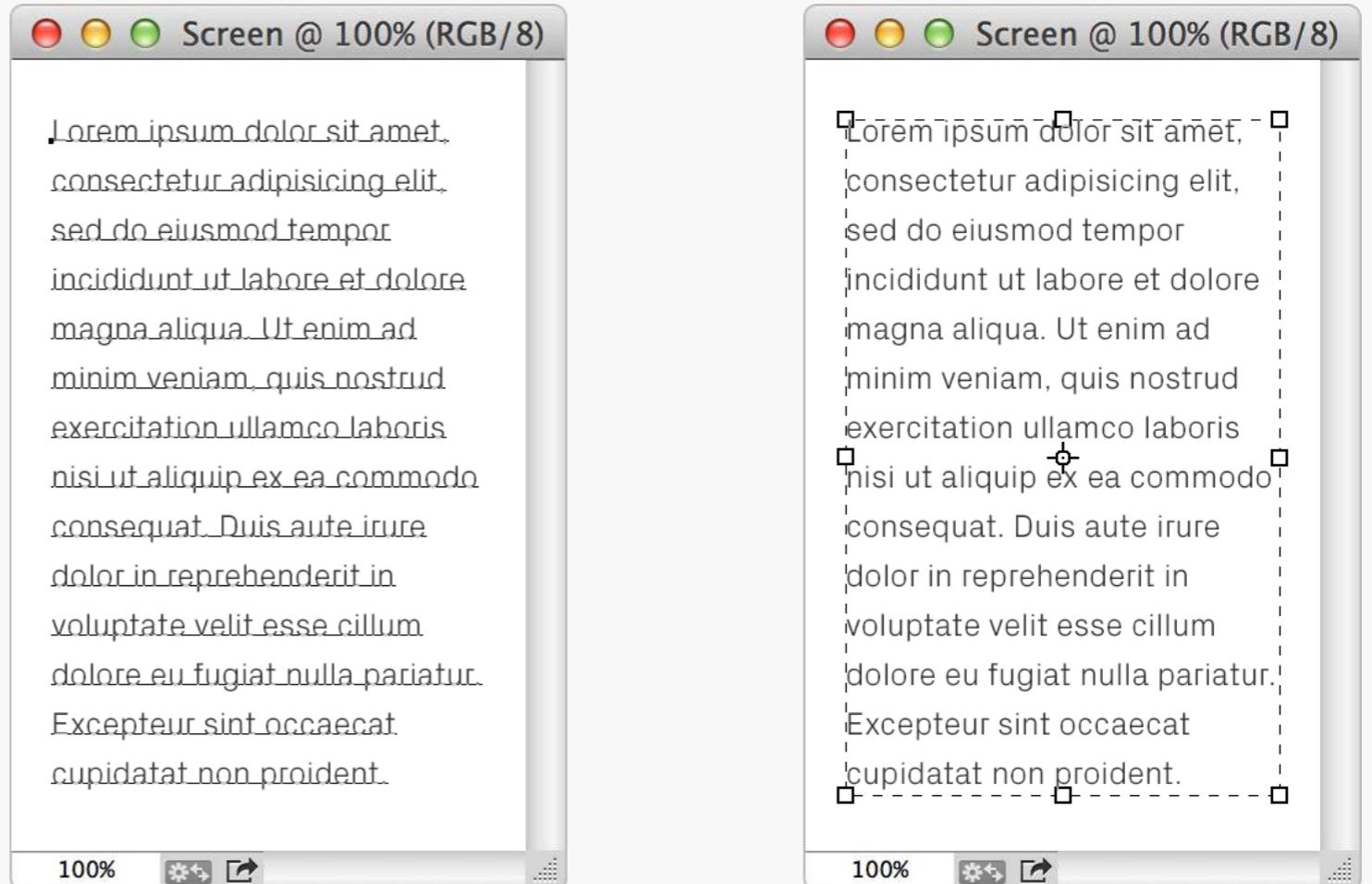


✗ Naughty

✓ Nice

## Text Alignment

When adding text, make things easier in the future by matching the paragraph alignment to that in the design — if the text is then changed, it will still look correct.



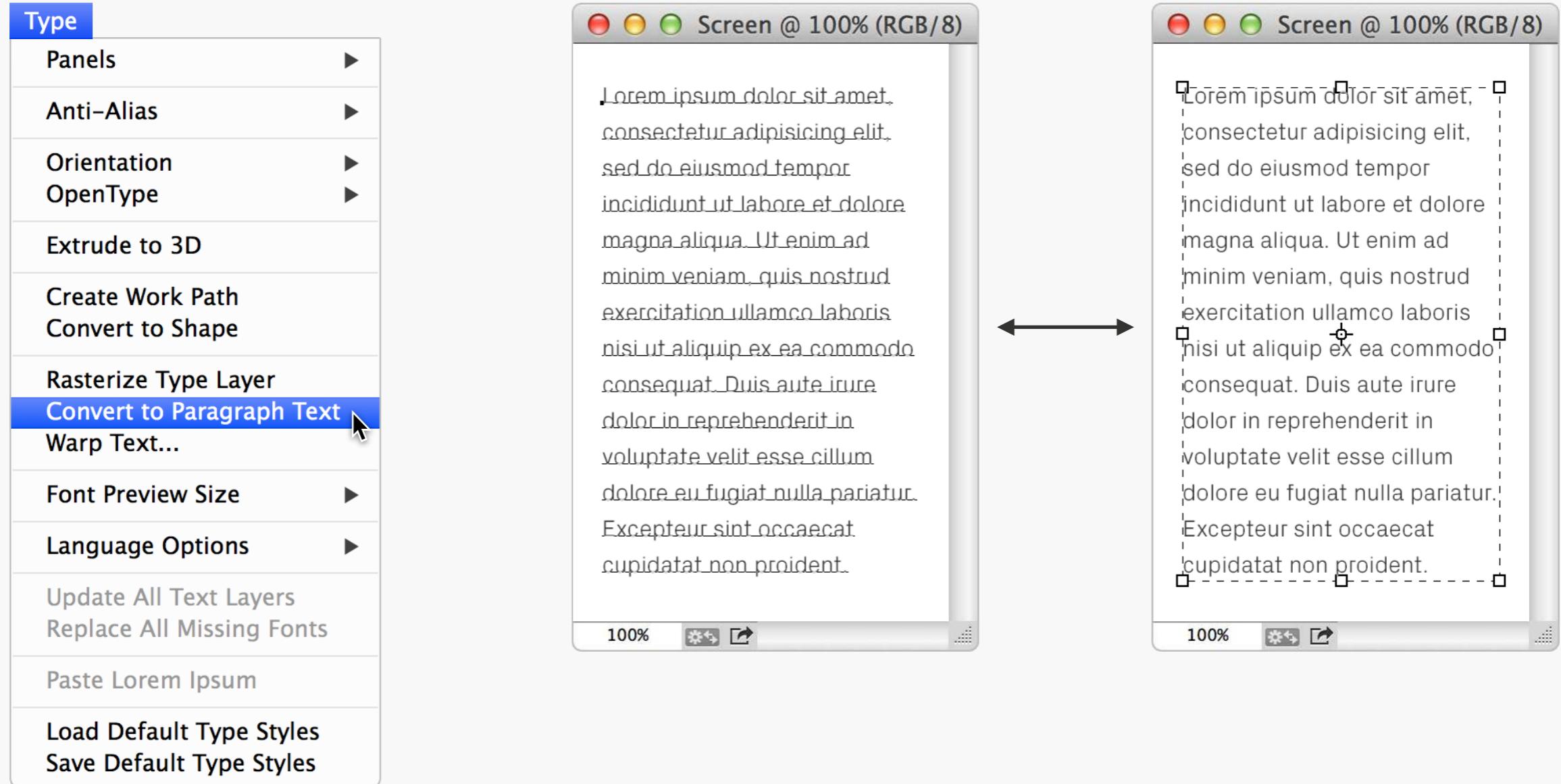
## X Naughty

# Paragraphs

If you've got a paragraph of text, then place it in a container (Paragraph Text) rather than manually adding line breaks (Point Text). These will often have to be reset if the copy or typeface is changed. With a proper container

though, the text will automatically wrap, making the paragraph easier to update.

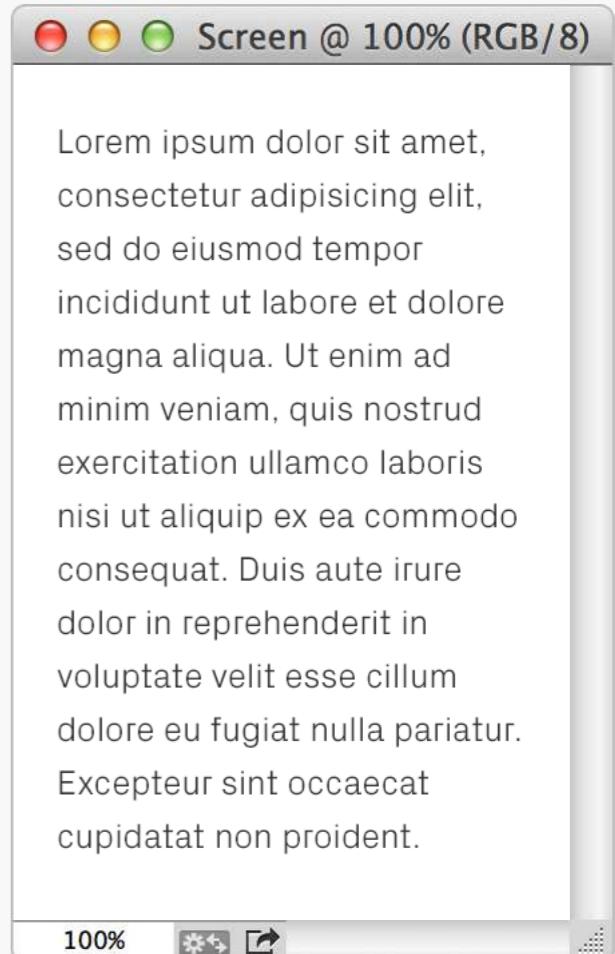
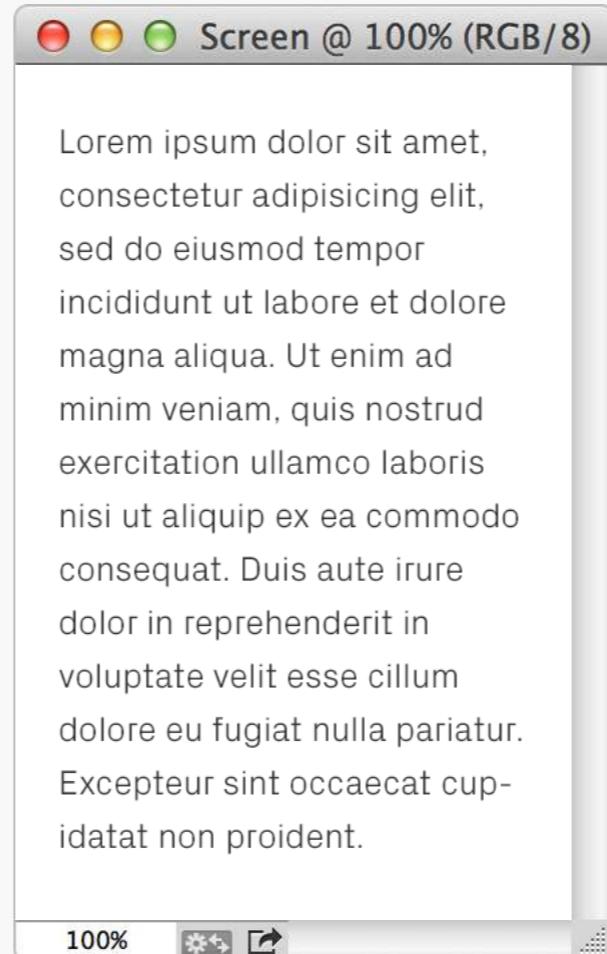
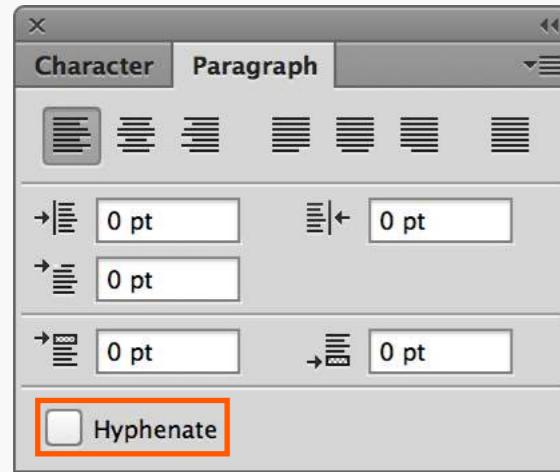
## ✓ Nice



# Convert to Paragraph Text

Fortunately, Photoshop allows you to convert Point Text to Paragraph Text, and vice versa, by selecting *Type > Convert to Paragraph Text / Convert to Point Text*, or right-clicking the layer and choosing the same option. In

Photoshop CS5 these are found in the *Layer > Type >* menu.

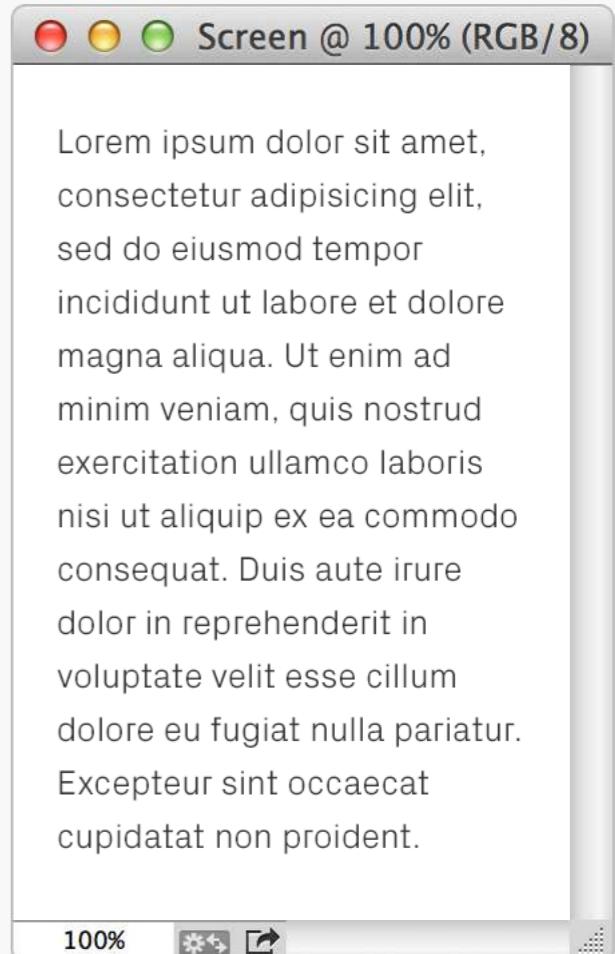
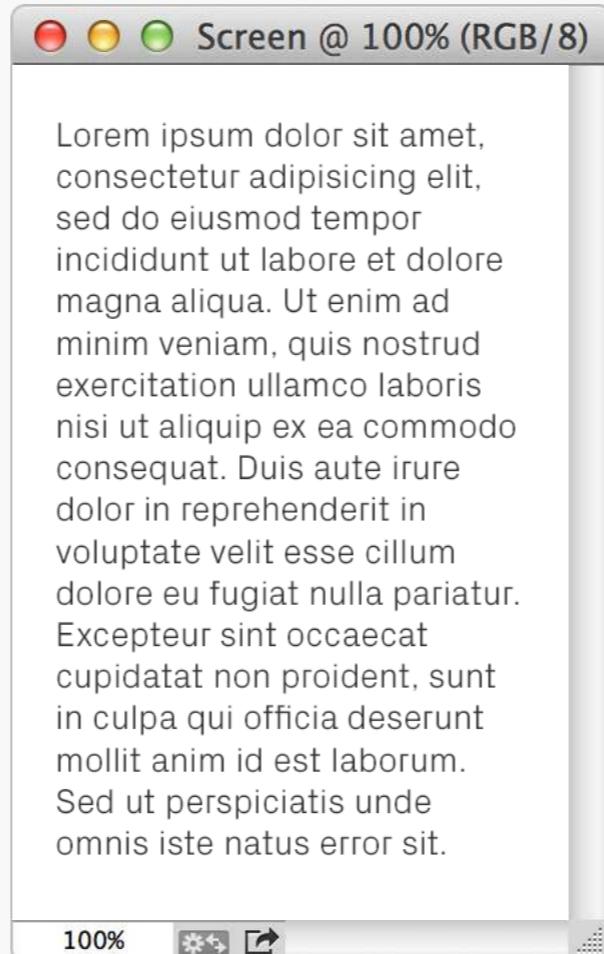
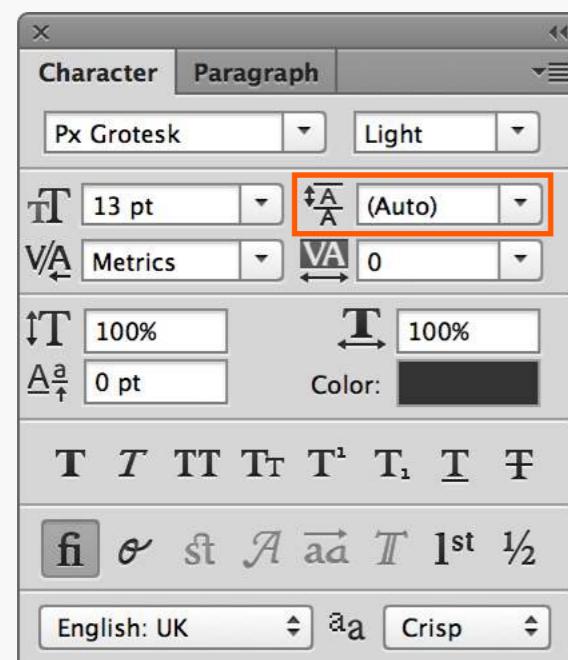


✗ Naughty

✓ Nice

## Hyphenation

Most devices don't support hyphenation, so for accuracy leave it out of your designs.

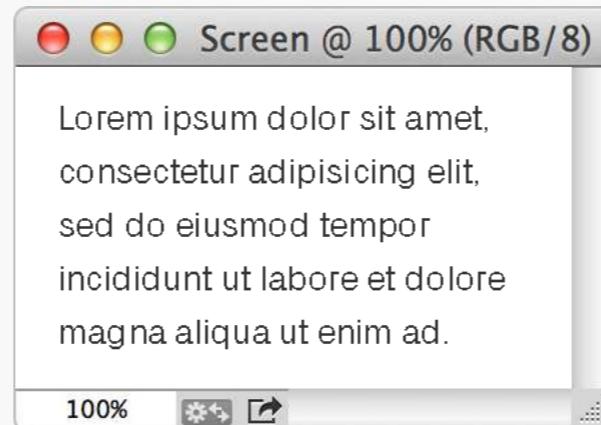
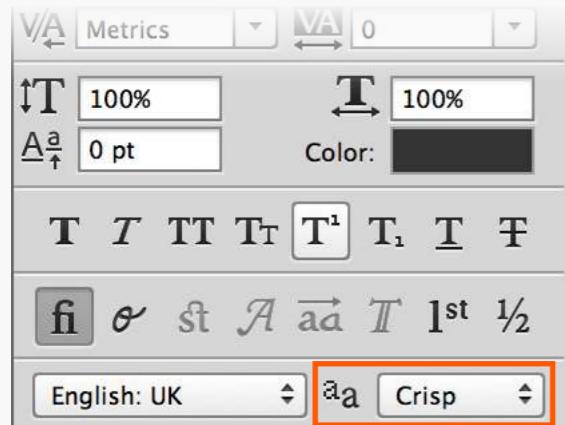


✗ Naughty

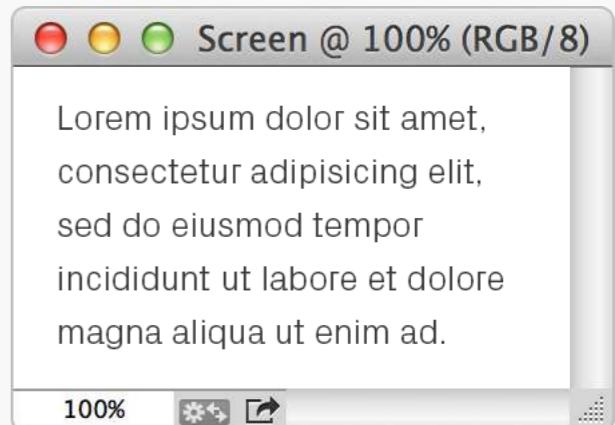
## Leading

Photoshop's default leading is just a bit too tight for comfort, so make your text easier to read by spacing it out a little bit. See how much better the Nice example above is after increasing from the *(Auto)* setting to *20pt*.

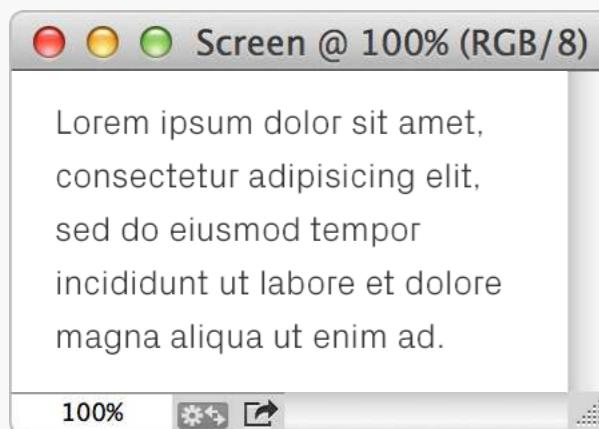
✓ Nice



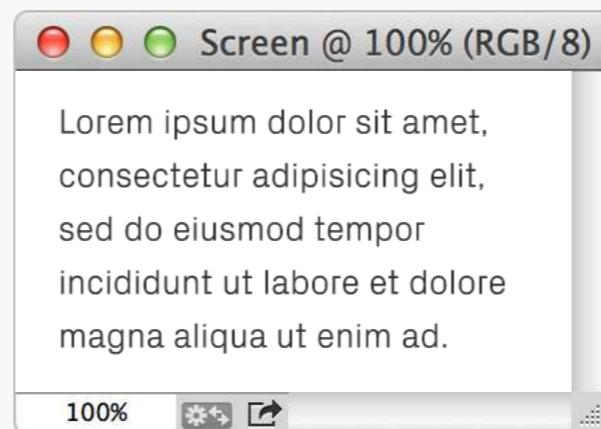
None



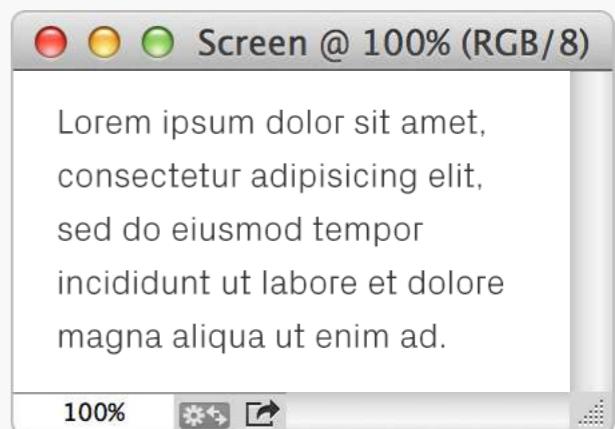
Sharp



Crisp



Strong



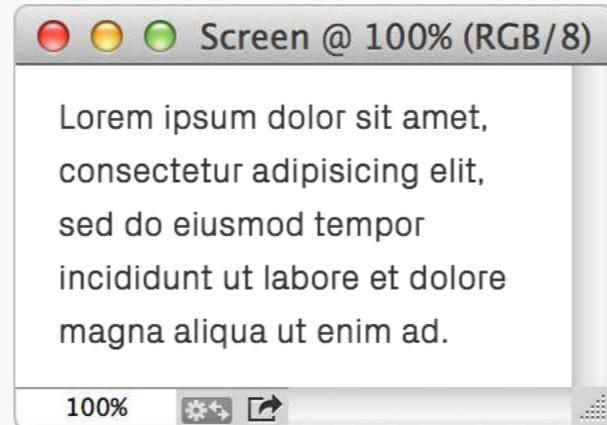
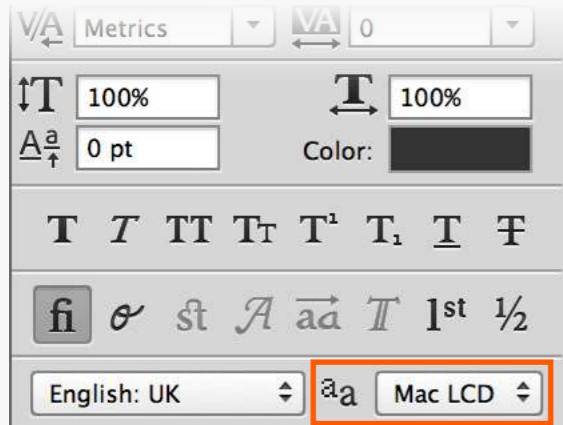
Smooth

## Text Anti-aliasing

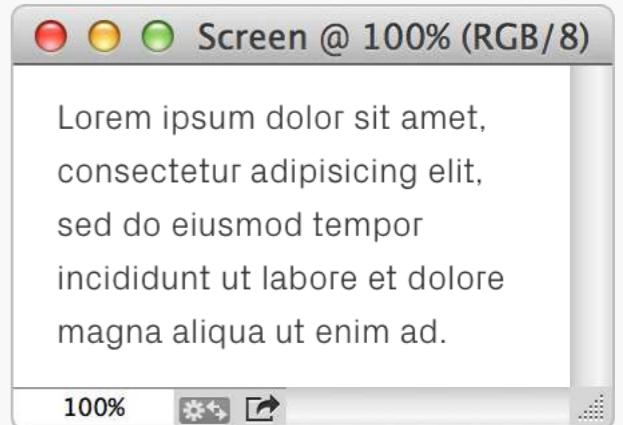
There are a few different types of text anti-aliasing in Photoshop, so try them out to see which gives you the most suitable legibility and rendering — *Crisp* seems to be a good all-rounder. Similarly, if you’re mocking up text that will be generated elsewhere, then find the

option which is the closest match to the intended screen’s anti-aliasing.

# Text Anti-aliasing System



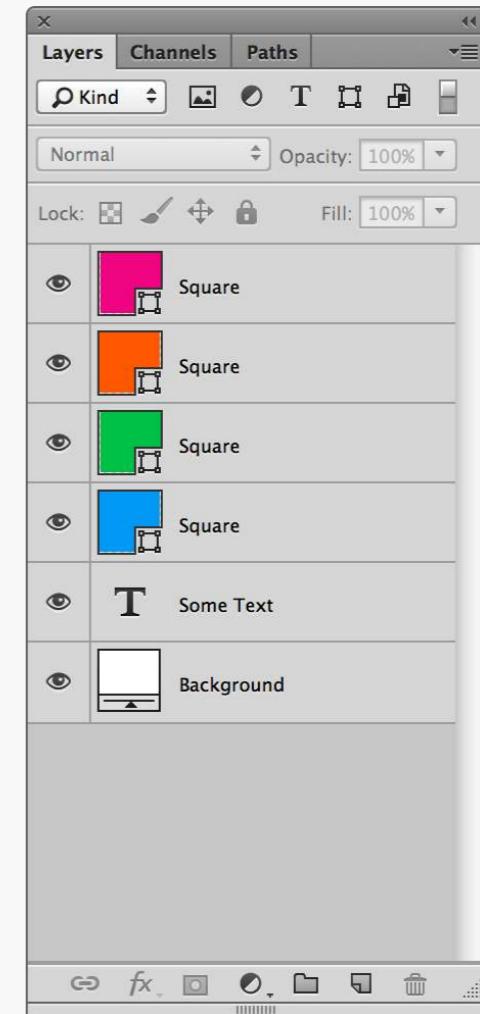
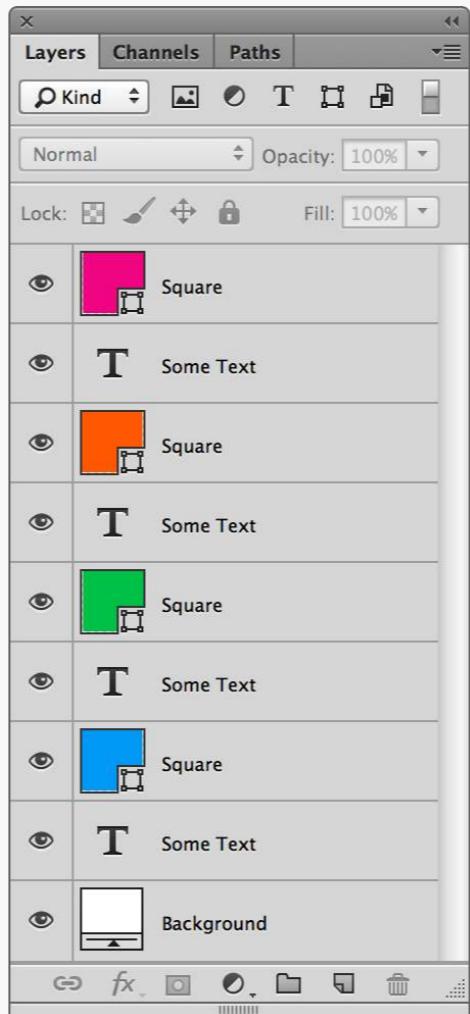
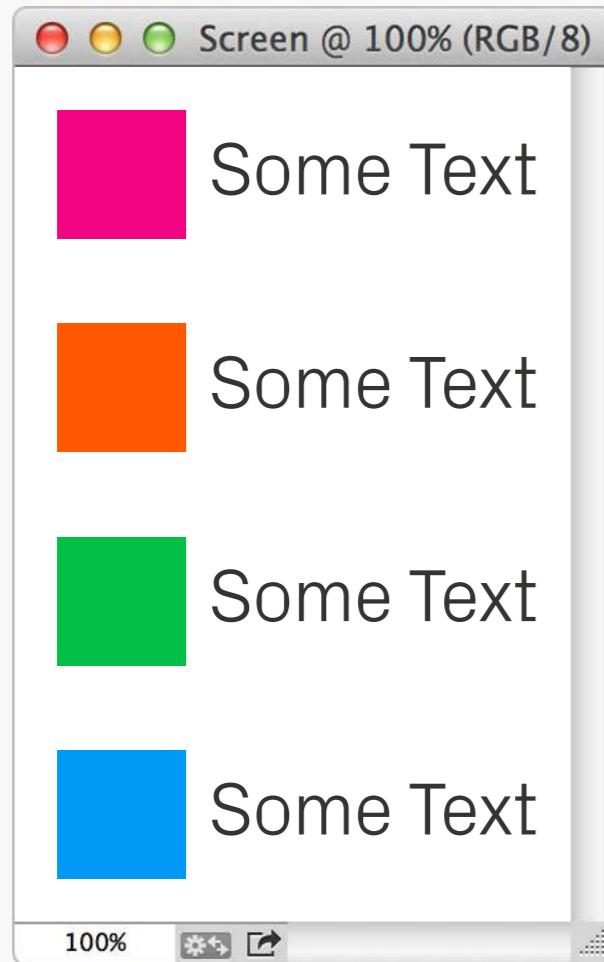
Mac LCD



Mac

Photoshop CC also includes anti-aliasing options that replicate the operating system's sub-pixel rendering, giving you a good idea of how text will look in a browser for instance. It's worth noting though that unlike browsers, the sub-pixels in Photoshop are greyscale, not

RGB. For a little extra detail on these new rendering options, have a look at Realmac Software's [Working with Type in Photoshop](#) blog post.



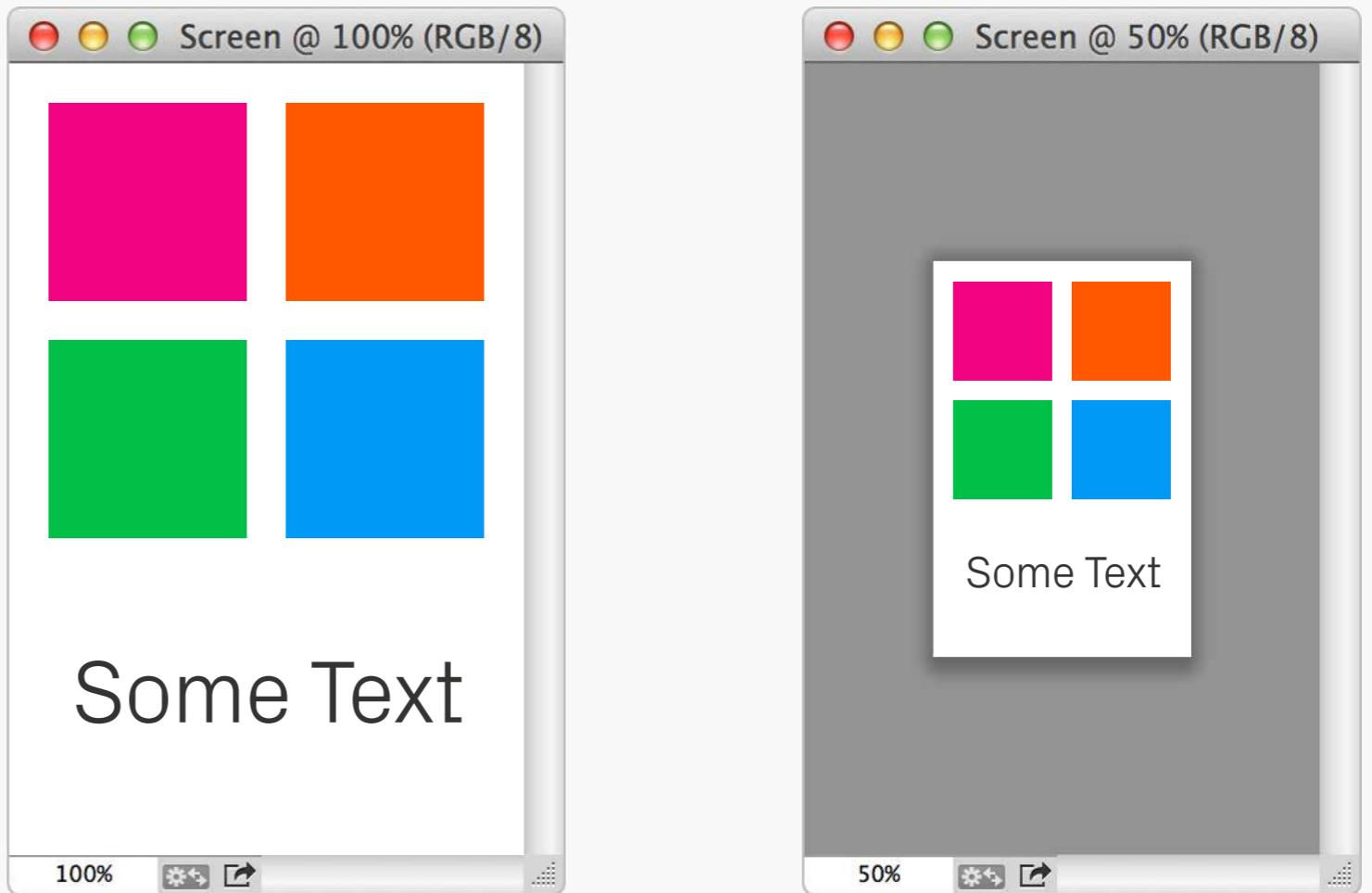
✗ Naughty

## Lists

When creating lists, especially those with graphics next to them, you might find it easier to place all the descriptions in a single text block and set the leading to the spacing you're after, rather than have each line as a separate layer. Not only will it keep the

content perfectly aligned and distributed, but it'll be quicker to update in the future.

✓ Nice



## Quick Preview

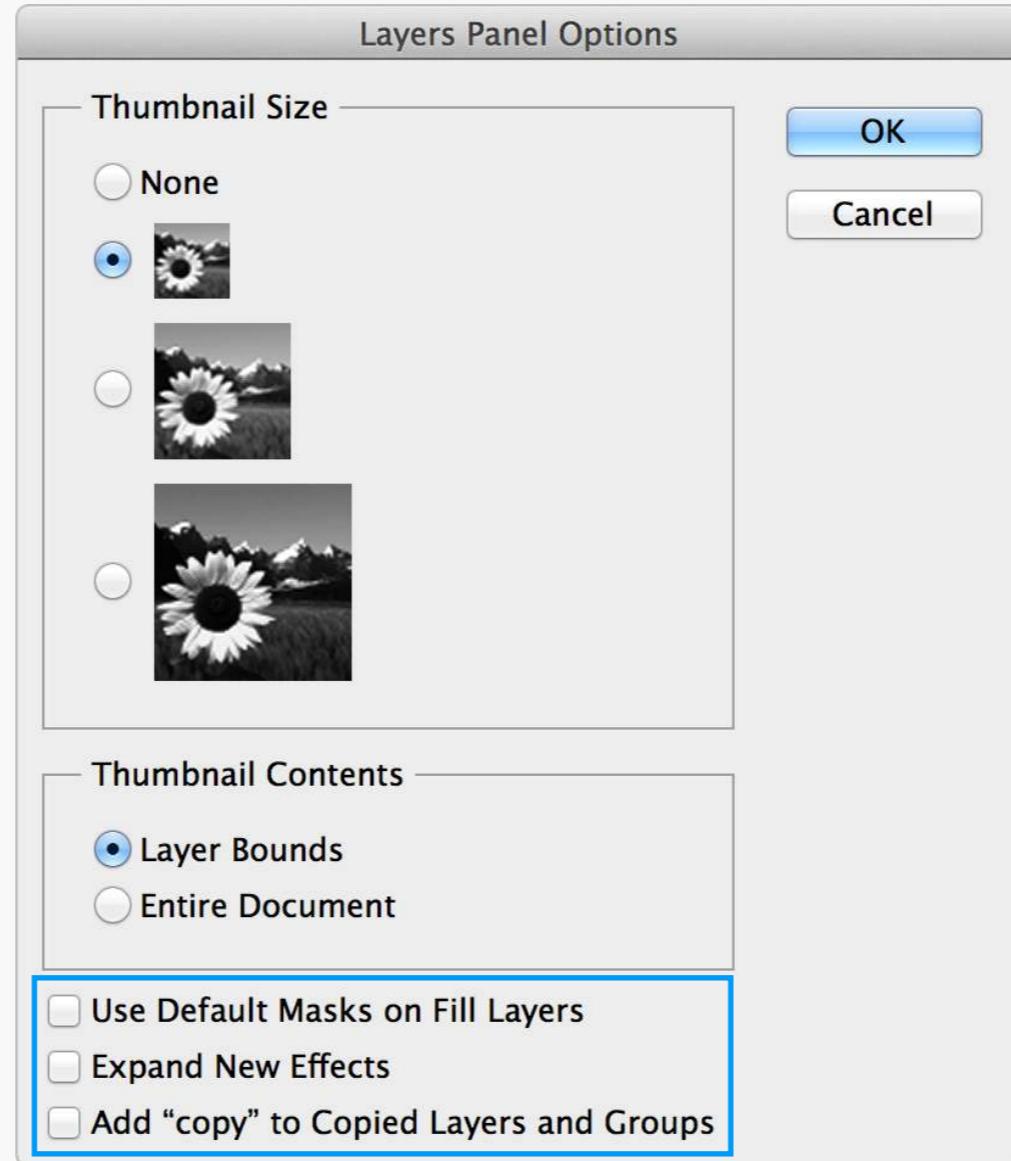
Mobile phone screens often have a higher pixel resolution (PPI) than those on computers, meaning the physical dimensions of your designs will be smaller on the former than the latter. As a quick check to see if text and interactive elements are a useable size, zoom

out until your document roughly matches the measurements of the phone screen — if anything looks too small make it bigger!

Photoshop

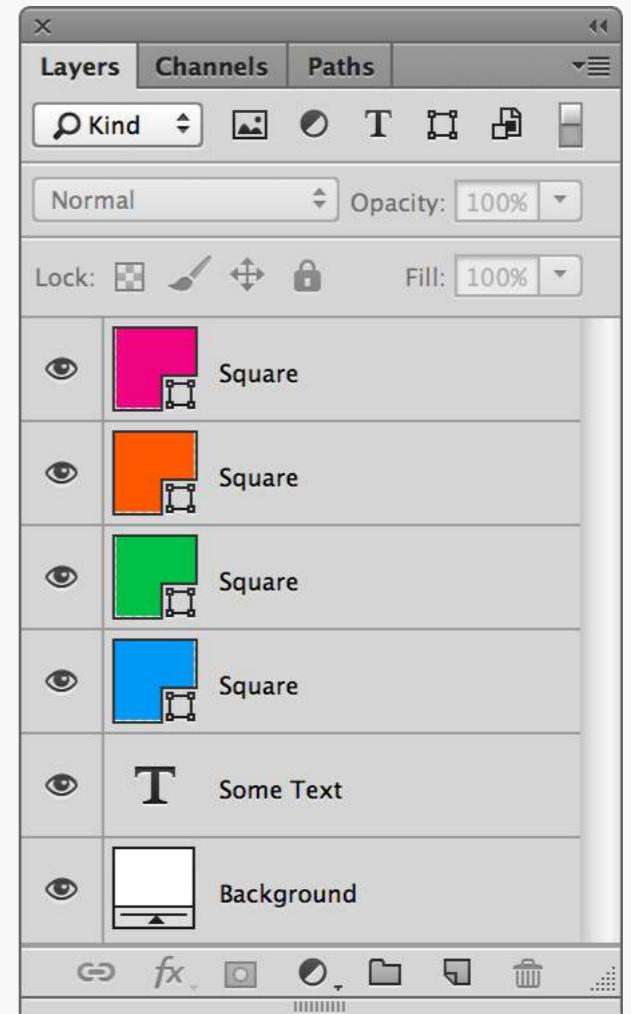
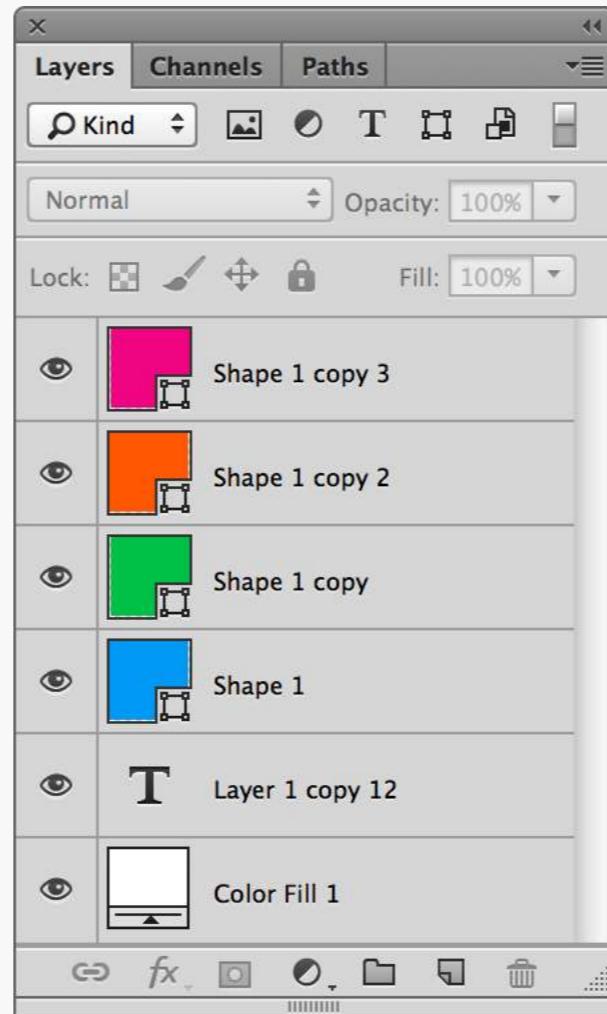
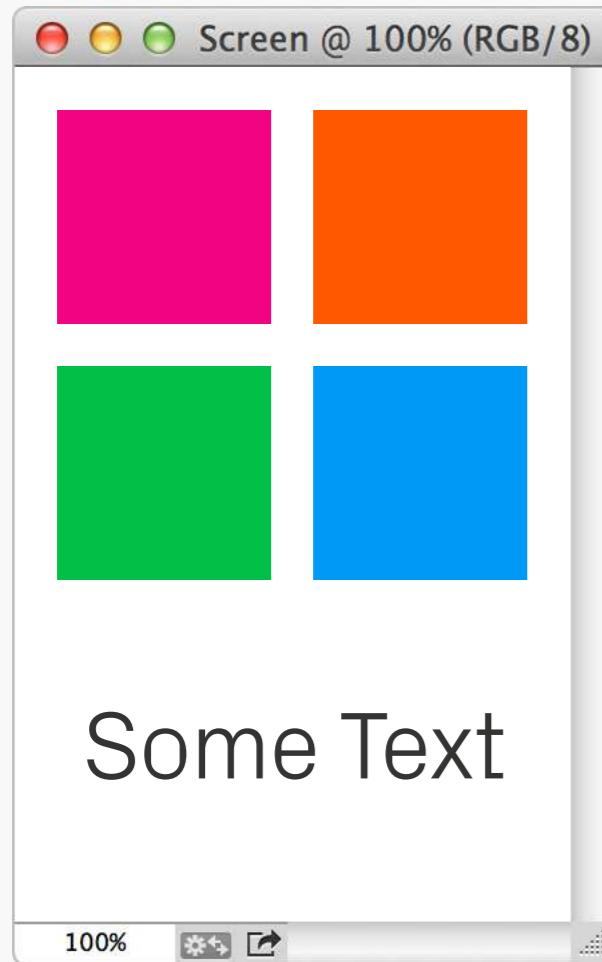
# **ORGANISATION**

# Layers Panel Options



By default, Photoshop will add “copy” to the end of every duplicated layer’s name — very annoying. To switch this feature off, and also remove some other visual clutter, go to the Layers Panel Options and untick *Use Default Masks on Fill Layers*, *Expand New Effects*, and

*Add “copy” to Copied Layers and Groups*. Every little helps.



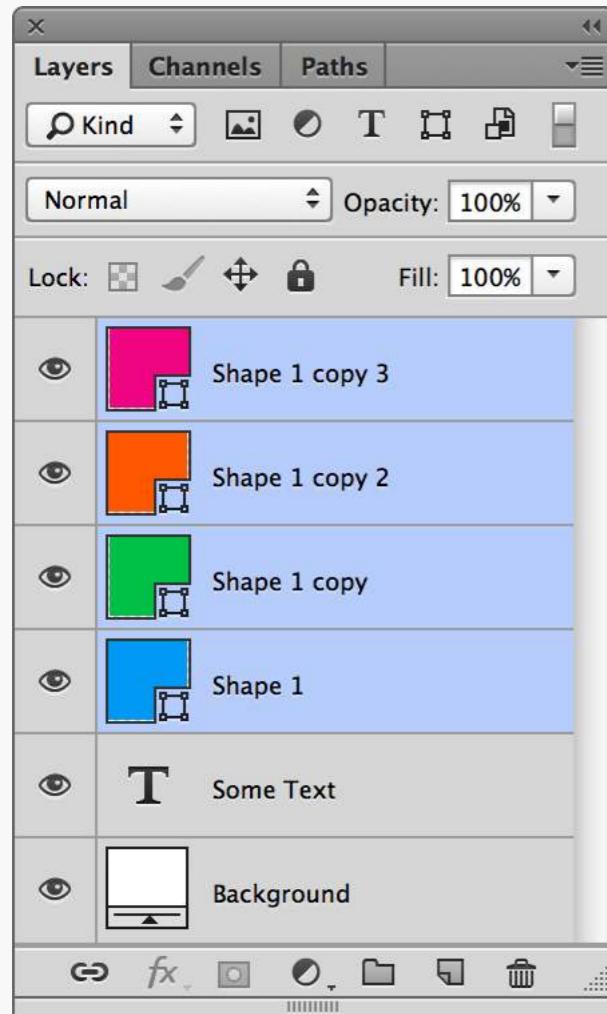
✗ Naughty

## Naming Layers

Don't be selfish, give your layers proper names. Not only does it make life easier for the next person who has to work with your files, but clients will think you're amazing if you send off something that's really well organised. Pro tip: name your layers as they're

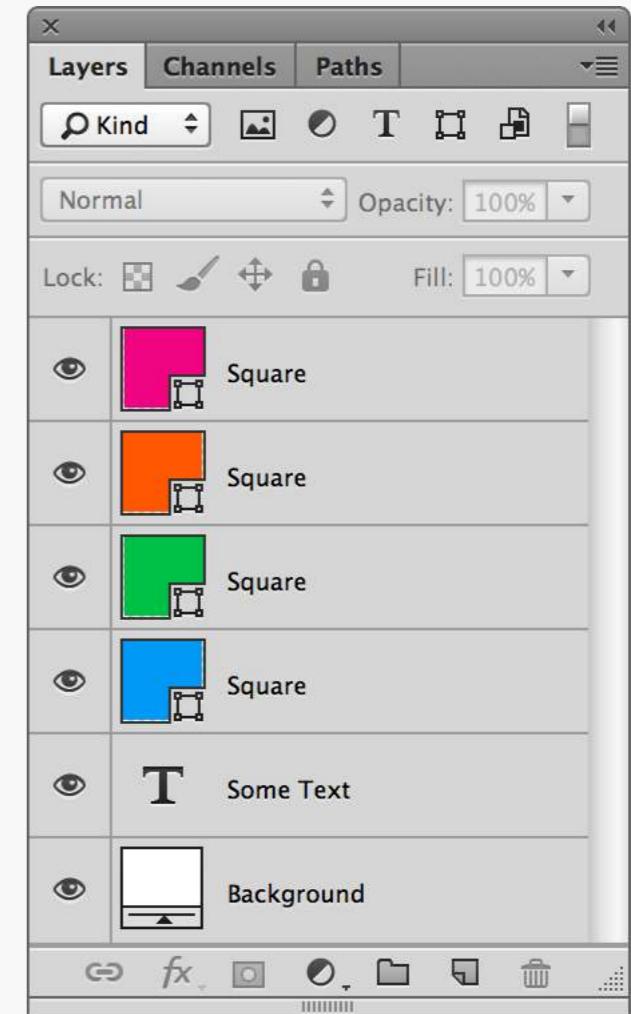
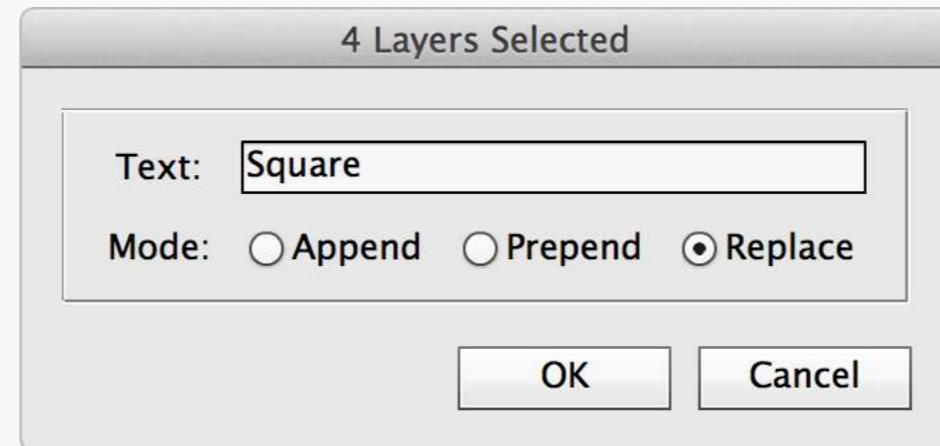
created so you don't need to rush and do them all at deadline time.

✓ Nice



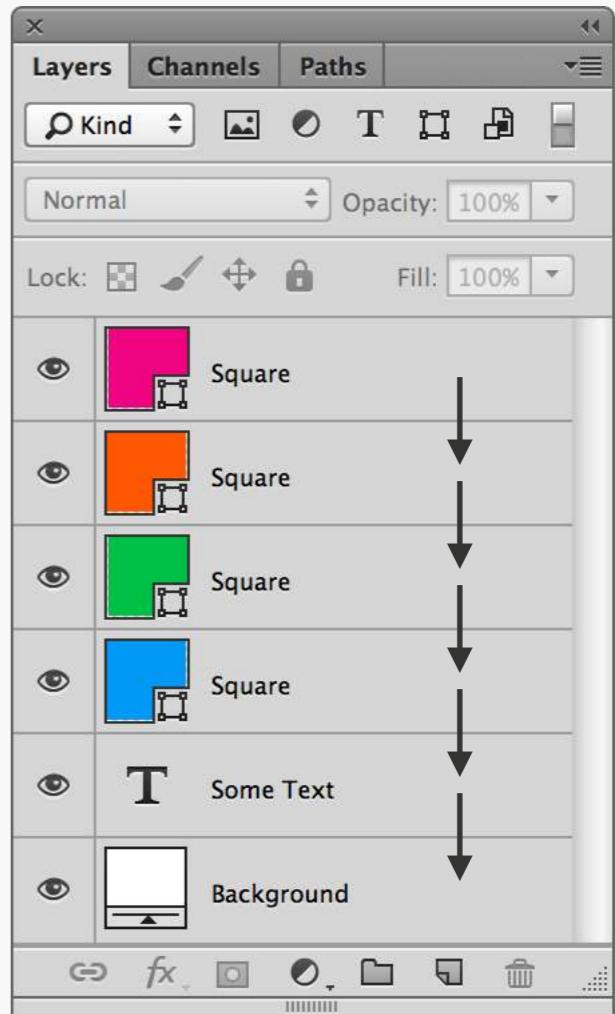
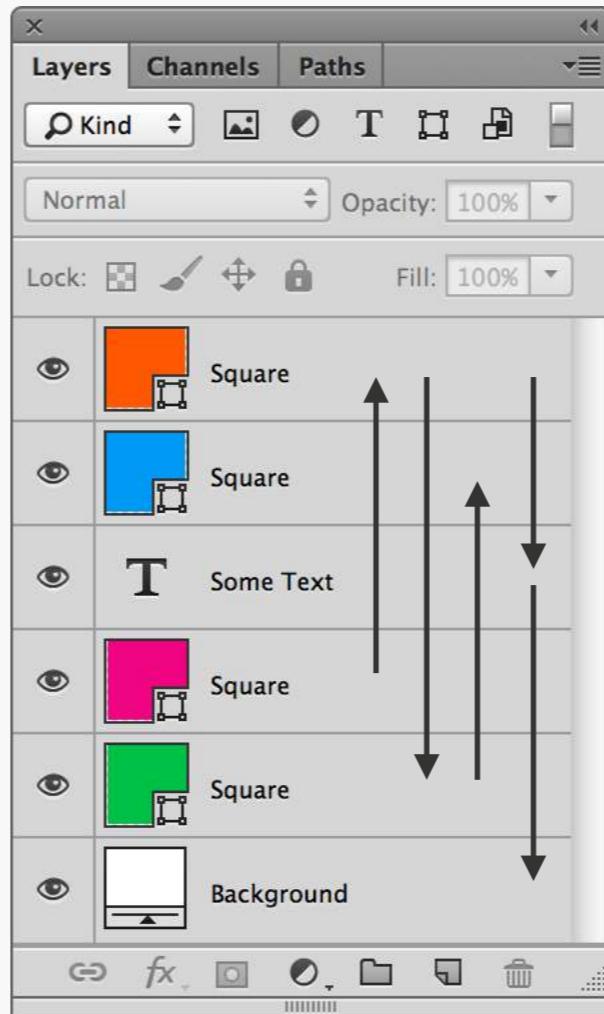
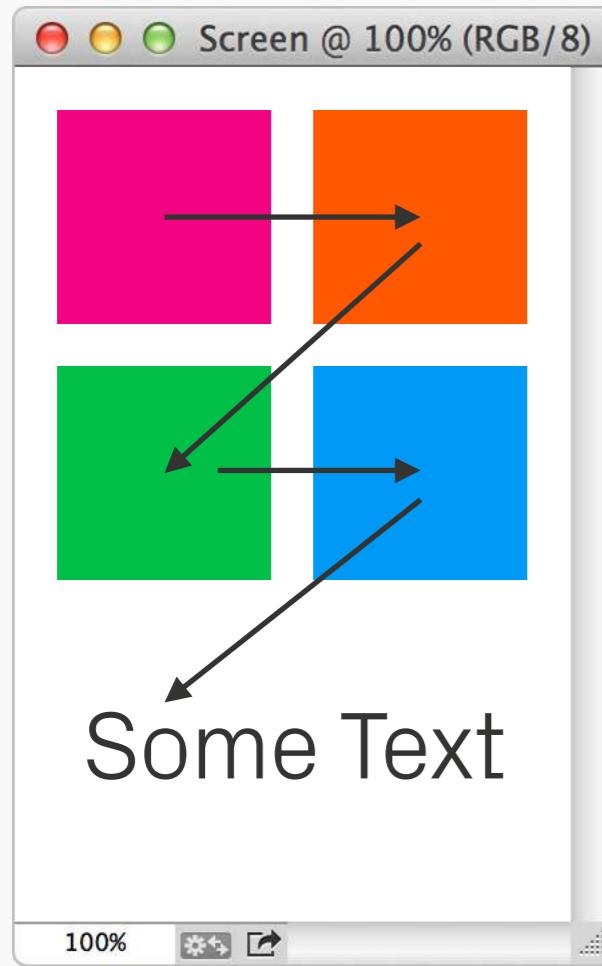
Before

## Group Layer Renaming



After

If you'd like to do some batch renaming then download this [Group Layer Renaming script](#) by Kamil Khadeyev. It does exactly what it says on the tin, letting you add text or completely rename layers, as well as attach sequential numbers using the `%n` variable.



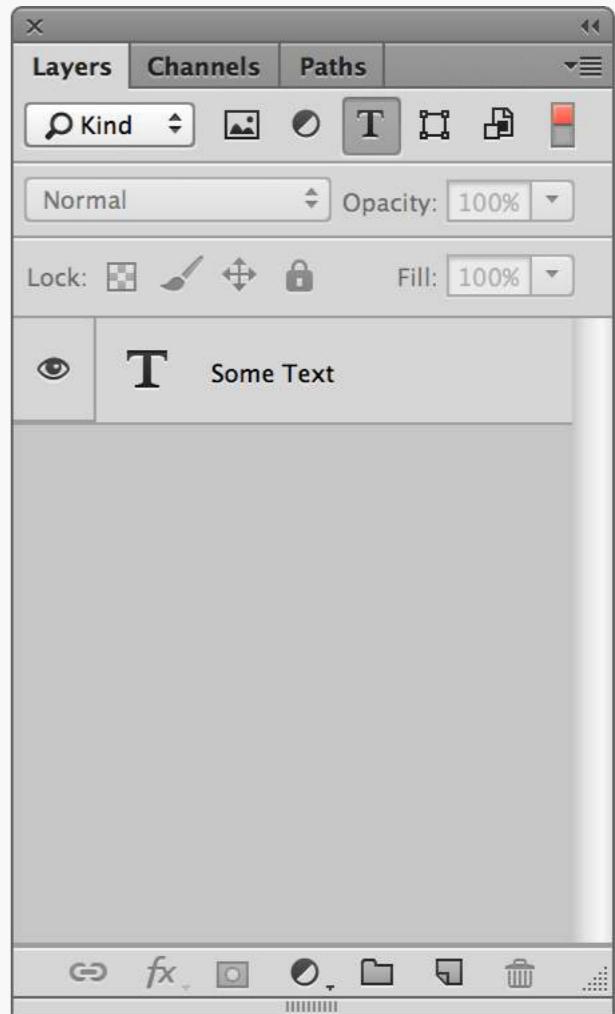
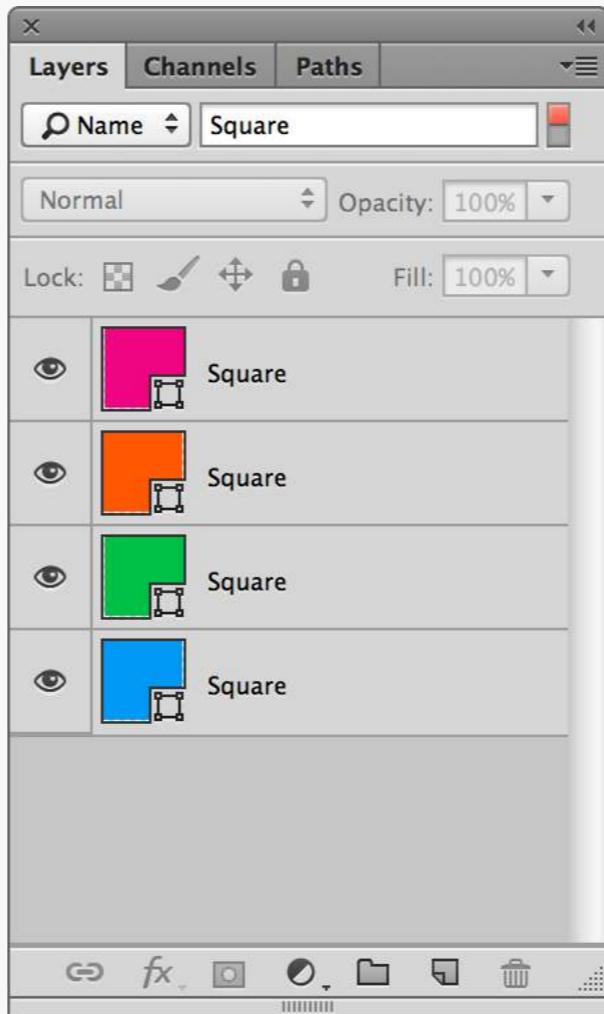
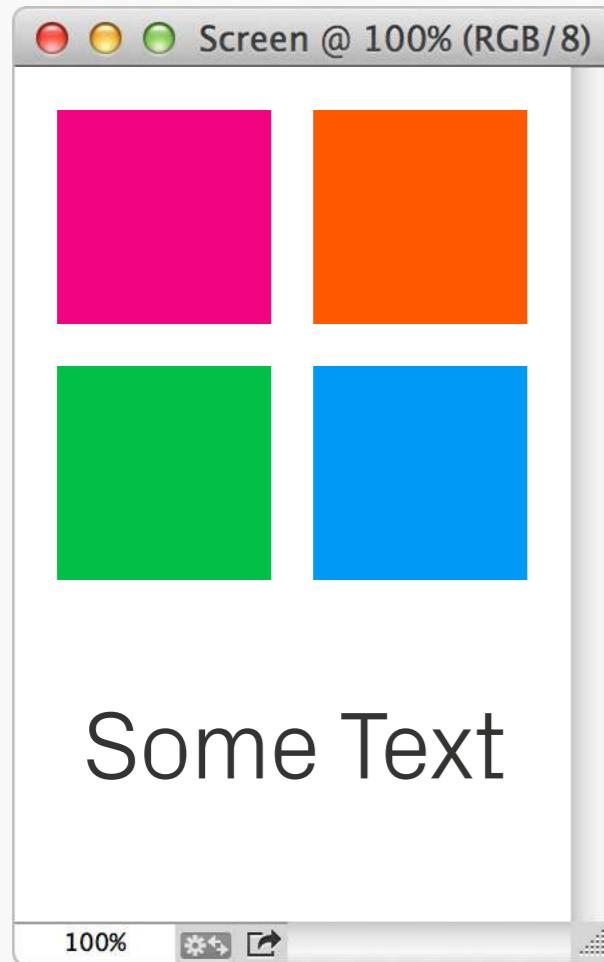
✗ Naughty

✓ Nice

## Ordering Layers

To make your files super special, be sure to order your layers logically in addition to naming them. A good method is following where the elements appear in the design from left to right, top to bottom, just like reading a

book (apologies if your first language goes in another direction).



## Some Text

### by Name

### by Kind

# Search

Coupling good organisation and the search features available in Photoshop will give you an incredibly powerful way of working with your designs. For example, by naming layers consistently with prefixes such as “btn”, “icn” etc. you can quickly filter them by their

content — perfect for situations like updating multiple buttons with a new style. There’s lots of other search types available, including Kind, Effect, and [Layer] Colour, so have a play and see what other filtering systems you can come up with.

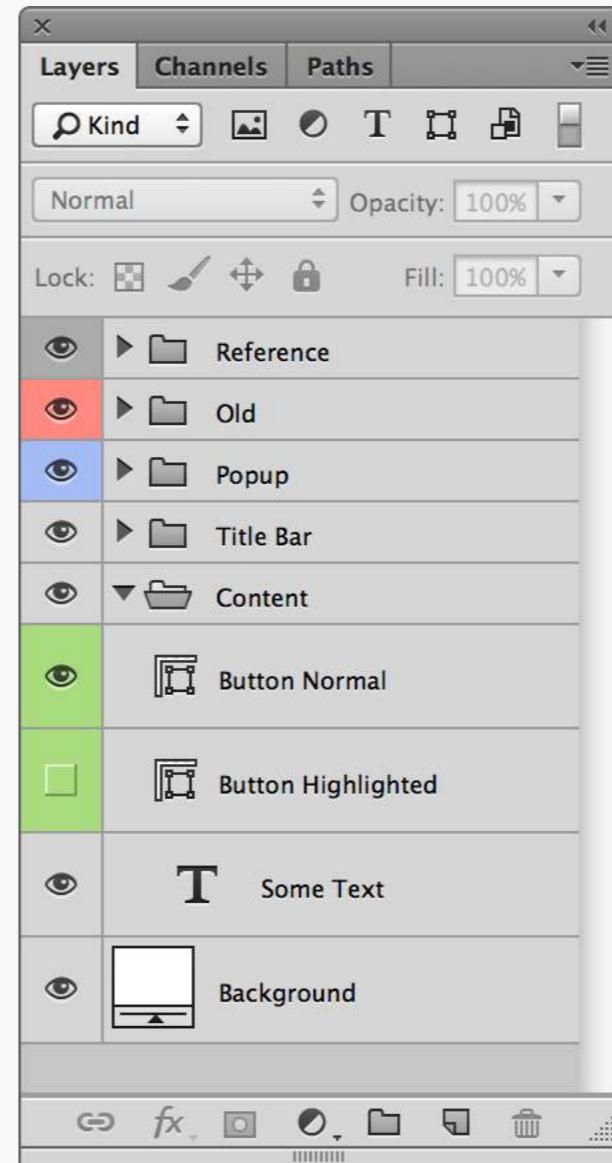
Grey ("neutral") used for reference items like wireframes or screenshots

Popup window

The green labels highlight different states of the same button

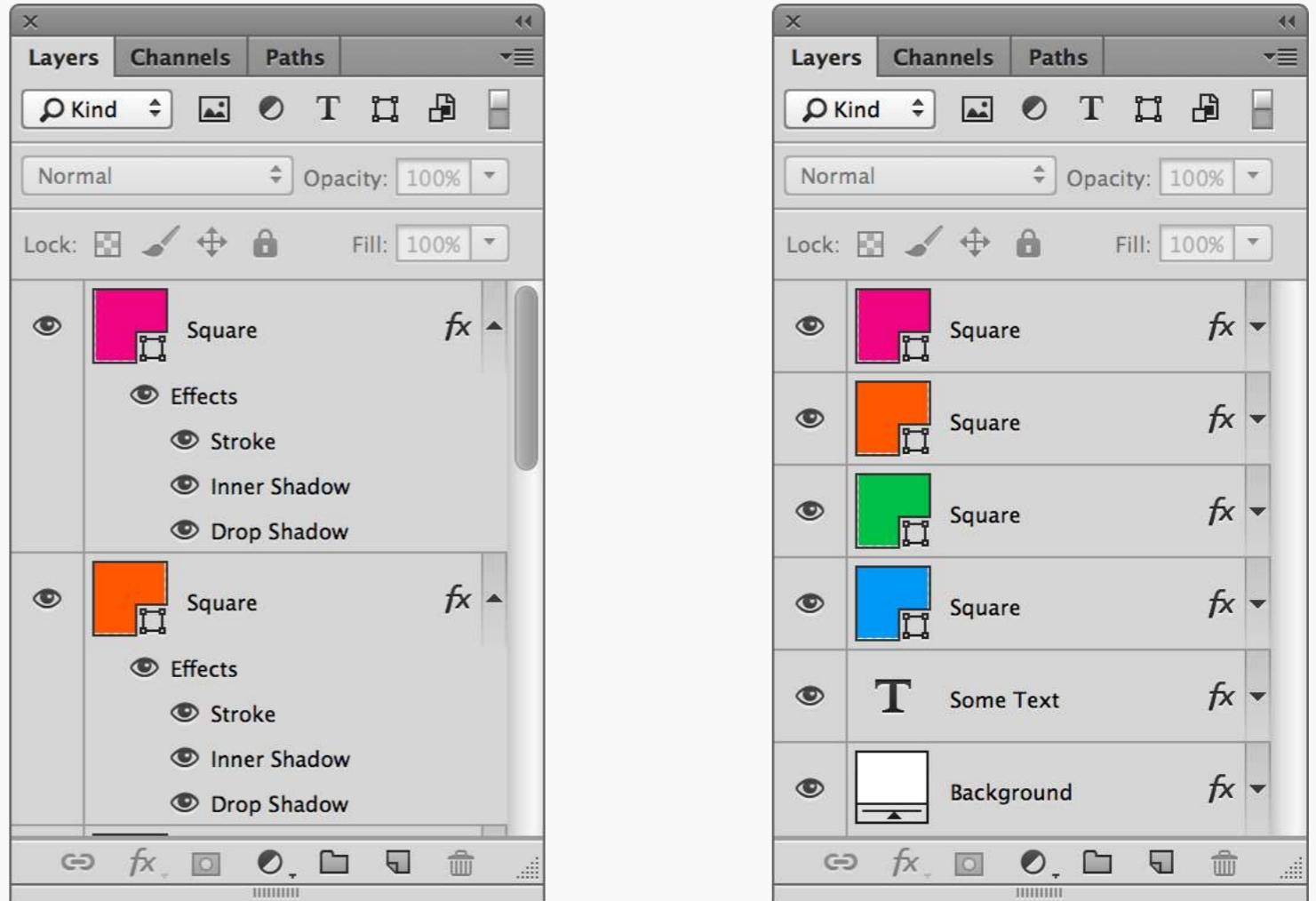
Red ("danger") for old, unused elements

Core design doesn't have colour labels



## Colour Coding

Here's an example of colour coding layers so they're easier to navigate. Try to leave the core design untouched though so the panel doesn't end up looking like a bag of Smarties. Right click on a layer to choose a colour label.

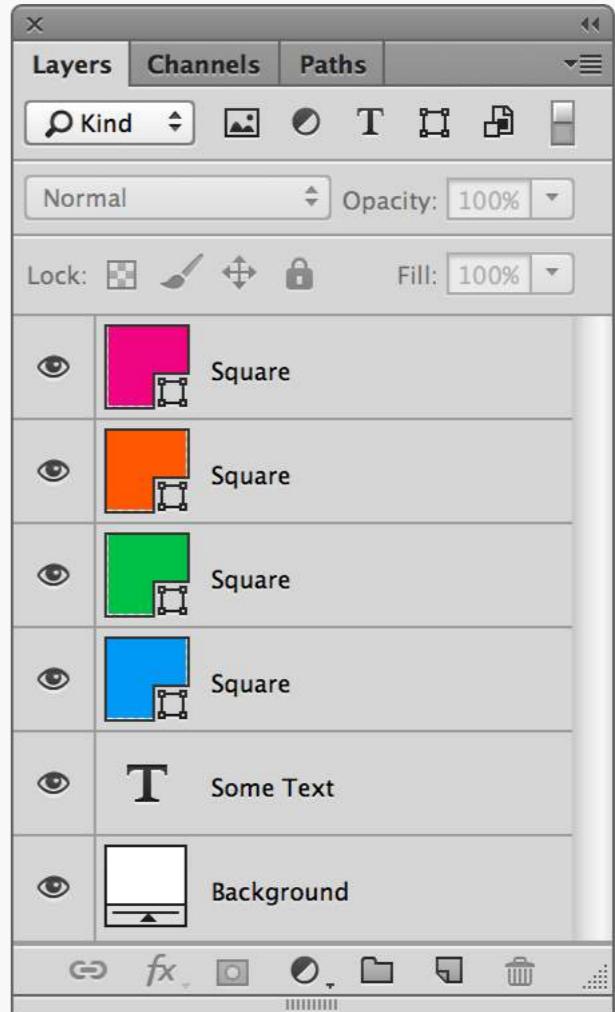
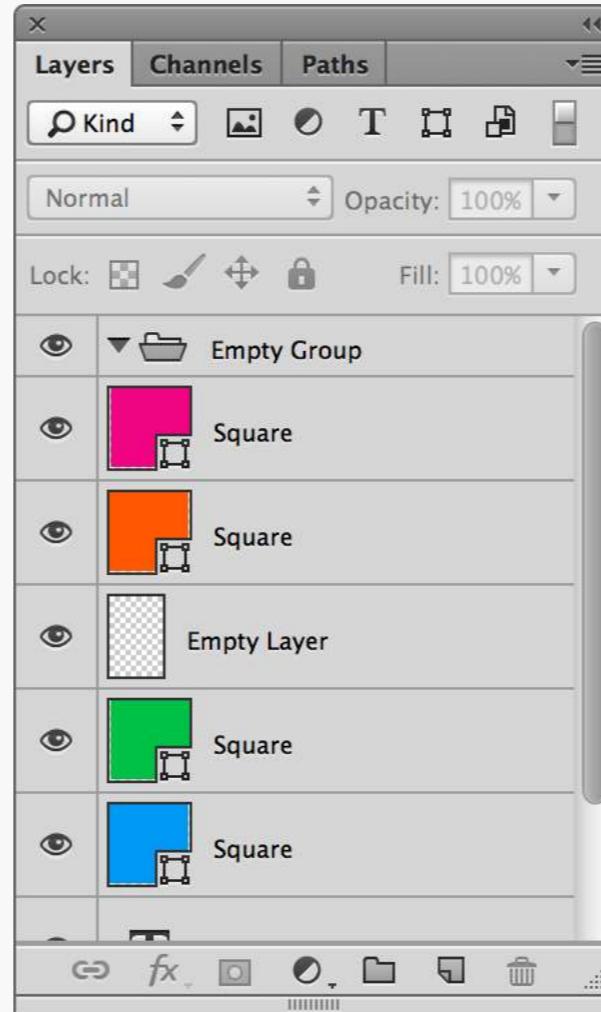
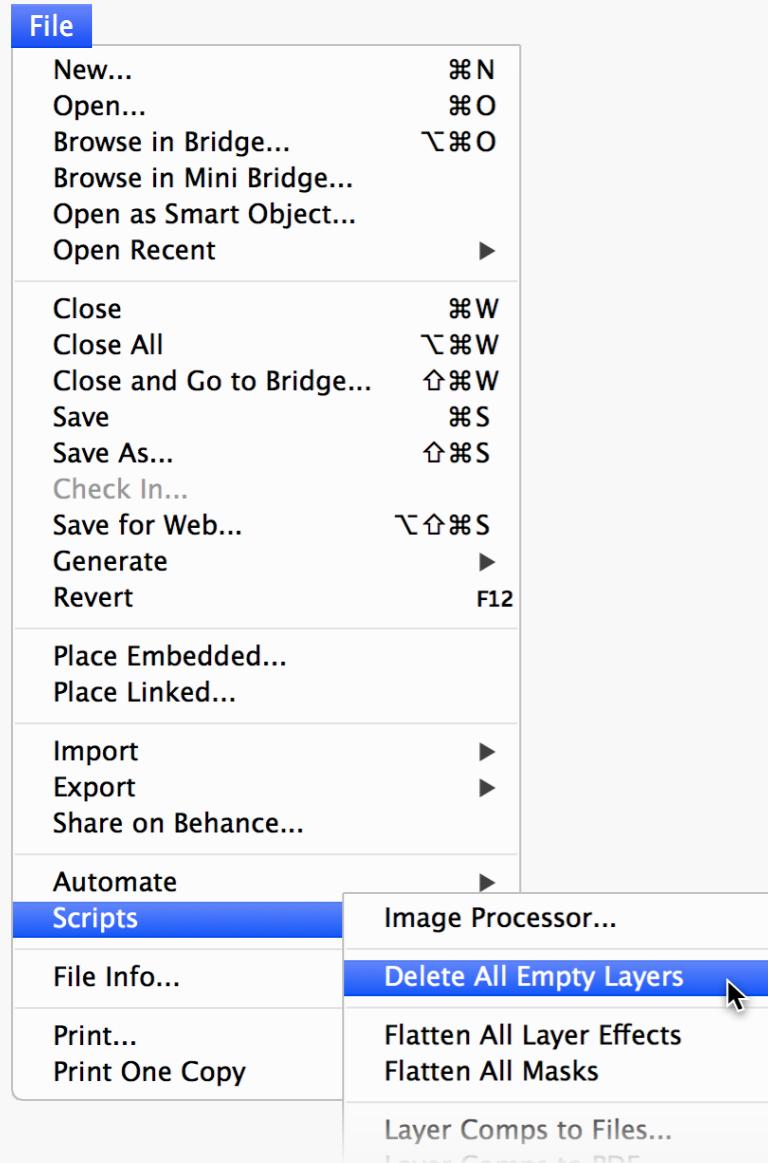


✗ Naughty

✓ Nice

## Expanded Layer Effects

Like a messy house guest, expanded Effects can make it harder to find the things you're actually after. Keep them collapsed and life will be better for everyone.



✗ Naughty

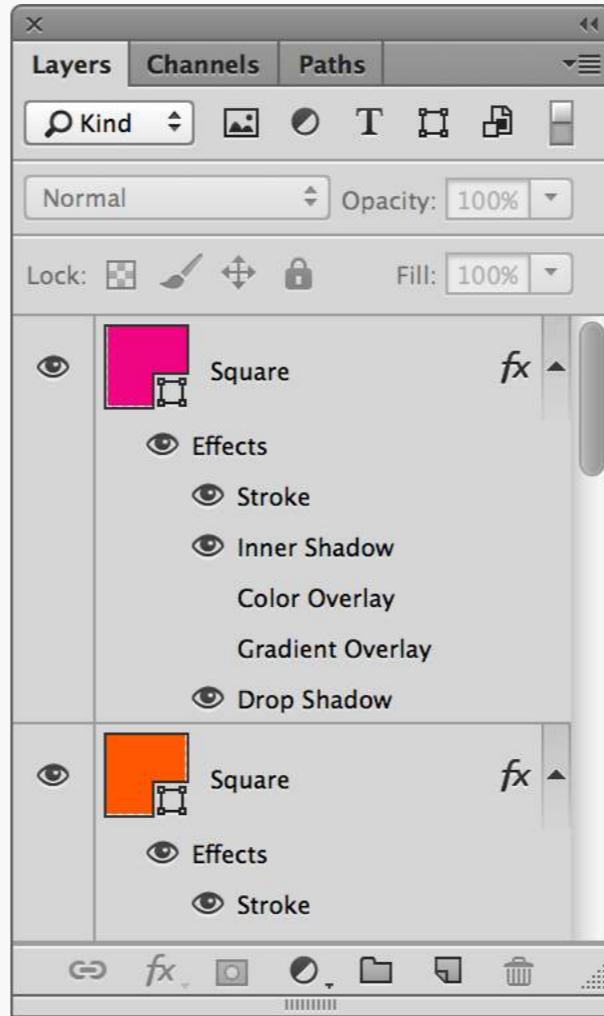
✓ Nice

# Delete All Empty Layers

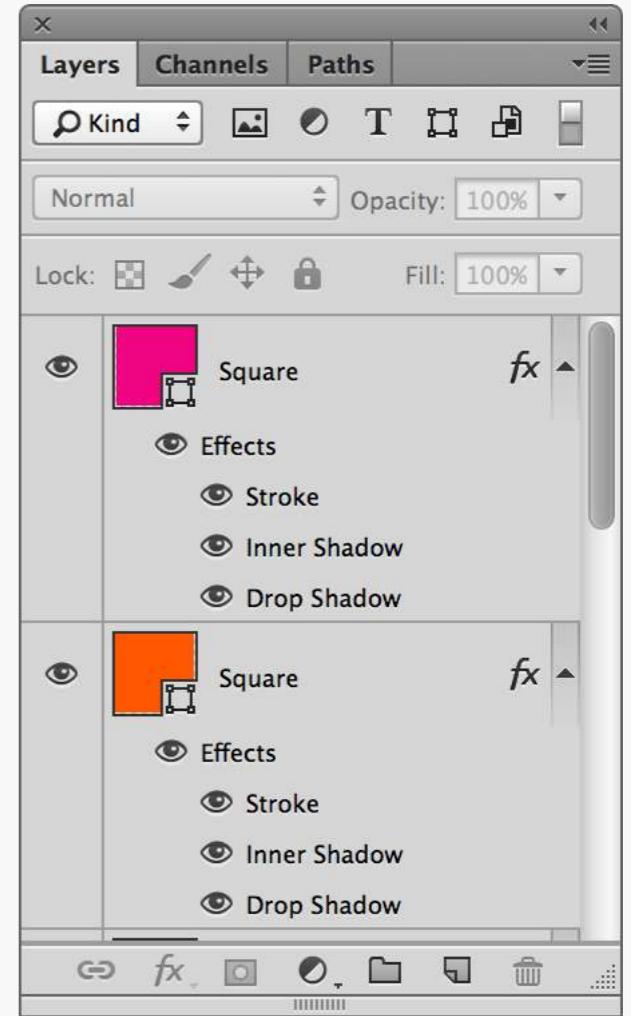
Try not to leave empty layers or groups scattered throughout your files, as they add unnecessary clutter. There's a handy script located in the *File > Scripts* menu called *Delete All Empty Layers* which does it exactly what you think it will.

# Remove Unused FX

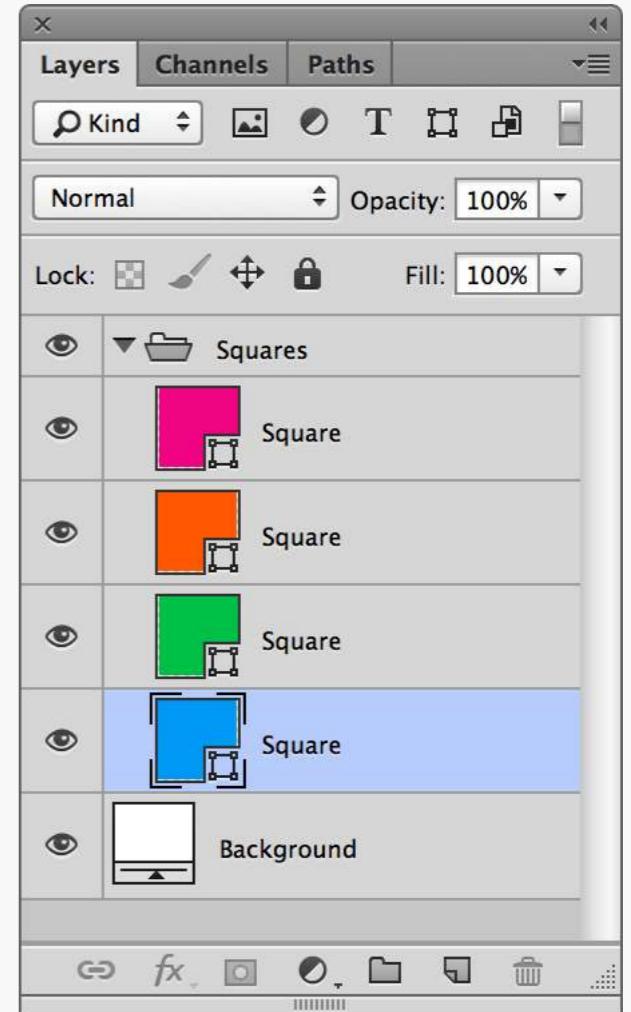
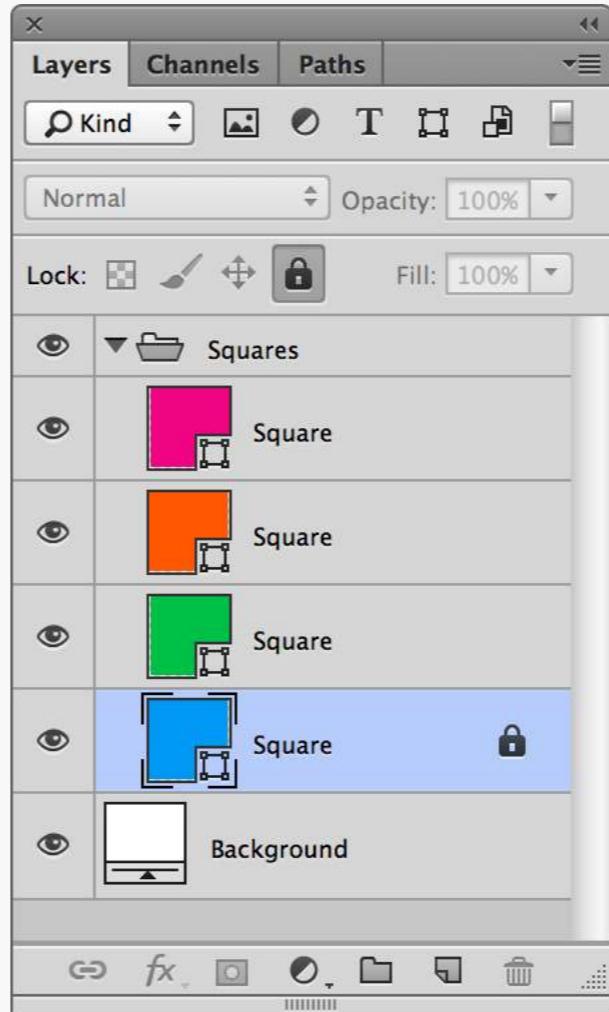
If you're experimenting with a design you can often end up with lots of unused effects floating around. You'd normally have to delete them one by one, but with the [Remove Unused FX](#) extension installed, they can all be gone at the click of a button.



Before



After

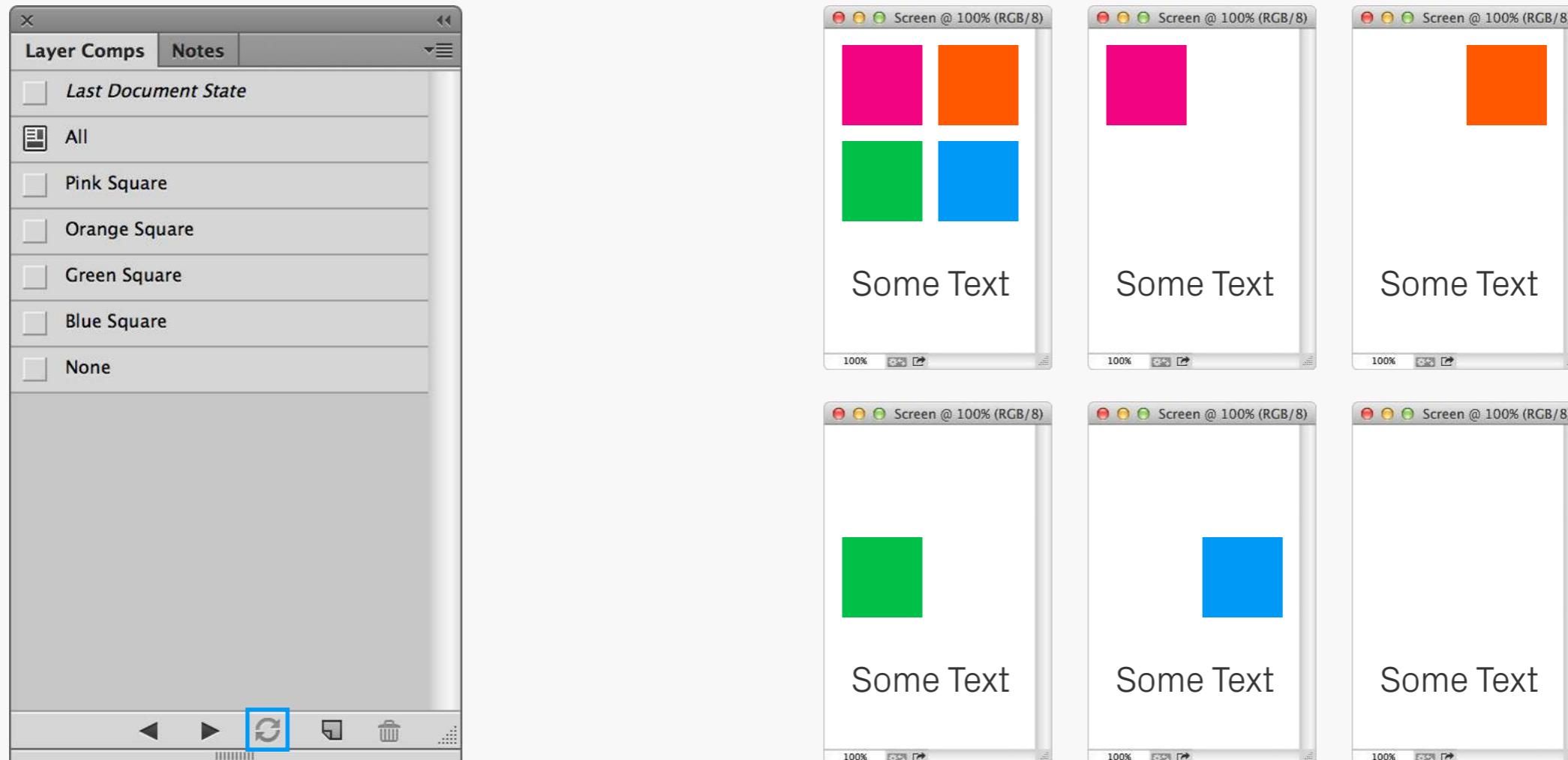


✗ Naughty

✓ Nice

## Locked Layers

Locks are a great way to protect an object while you're working, but make sure they're switched off before handing the file over to other designers. A locked layer hidden deep within a file is a pain when it prevents you from moving or deleting a group.



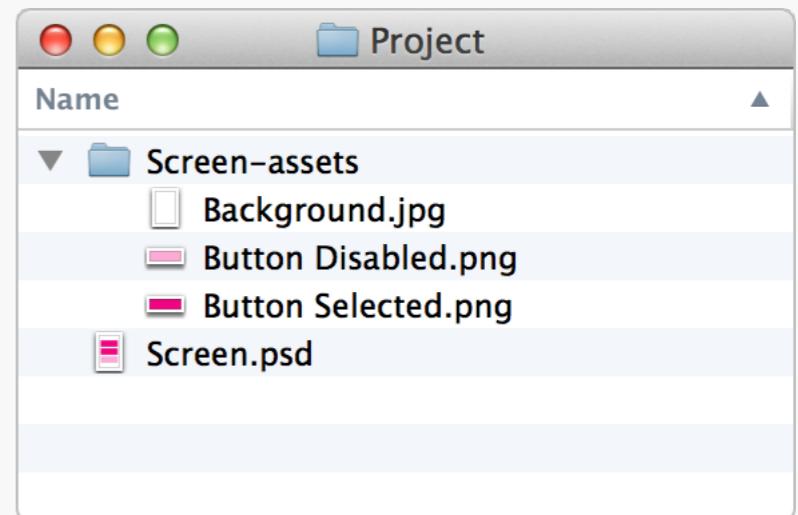
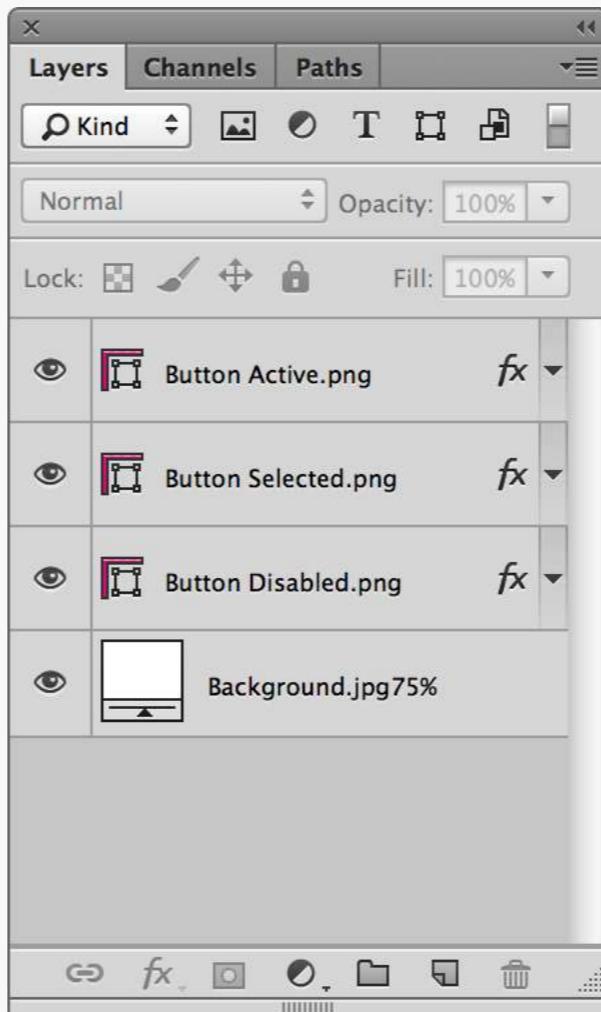
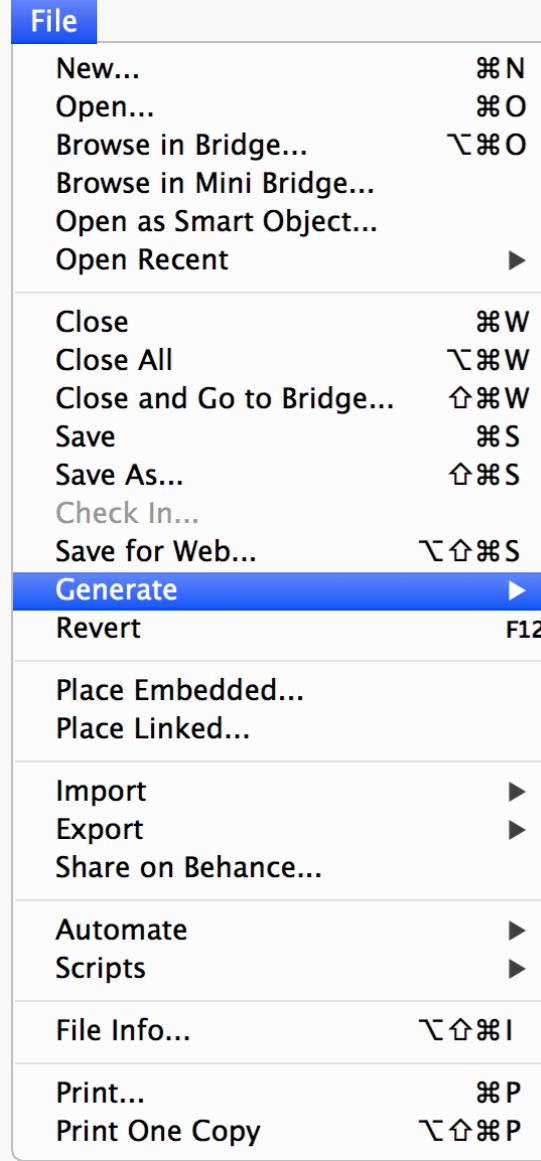
## Layer Comps

Layer Comps are a really useful way to store multiple variations of a design within one file. At a basic level they allow different layer visibilities to show and hide content in different configurations, but there's also the option to toggle individual Effects on and off,

and even modify the position of an object. Remember to save your changes to a comp by hitting the update button.

Photoshop

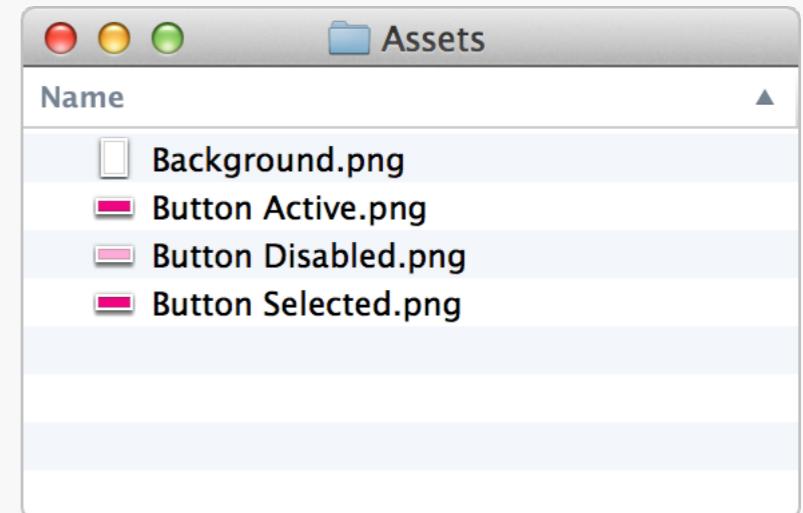
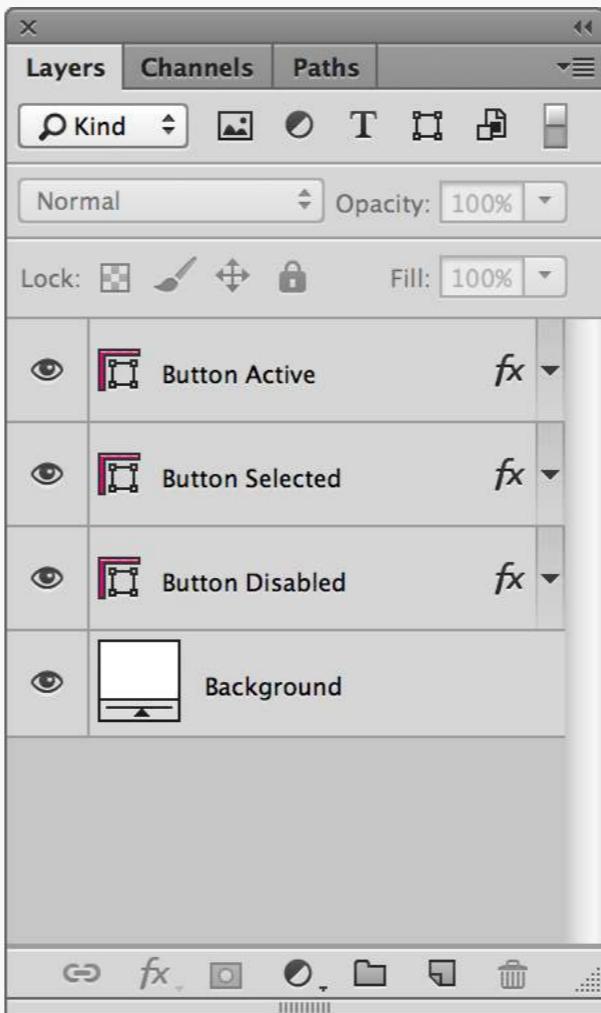
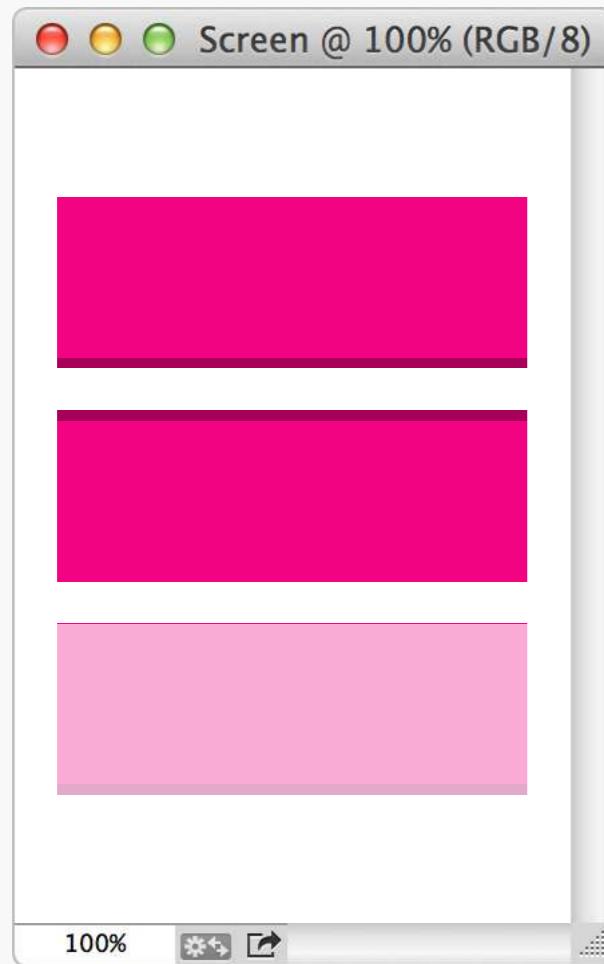
# **EXPORT**



# Generator

Generator is one of the best new features in Photoshop CC, allowing you to export layers or groups by simply adding a file extension to their name. Once activated from the *File > Generate* menu it will run through and create a folder of assets, automatically updating them

when any changes are made to the source file — woohoo! There are also various parameters available that can scale and/or adjust image quality, as well as output multiple versions of the same asset. Check out this [Generate image assets from layers](#) page for more info.



## Export Scripts

There's still a way to automate asset export if you're not using Photoshop CC. Instead use our *ustwo Crop & Export* scripts (see next page for details). The first thing you need to do is set up your files so they work properly, put every individual object that you want to export

as its own layer or group, and give it an asset name. It doesn't matter how many layers a group contains, as the scripts only work at the root level. Also, by laying out the components separately, as shown above, you'll end up with a useful reference sheet.

# Export Scripts

Now that your file's sorted, use one of our scripts to export all the individual assets as PNGs... no muss, no fuss. Just copy them from *Scripts* in the PPP Extras to your *Adobe Photoshop CSx/Presets/Scripts* folder, (re)start Photoshop and you're good to go. Once installed they can be accessed from the *File > Scripts* menu.

## **ustwo Crop & Export [filename][layername]**

This will crop to each asset and then export the file as *[filename][layername].png*, meaning a layer called *\_normal* from *button.psd* would end up as *button\_normal.png*.

## **ustwo Crop & Export [layername]**

Same script as above except it doesn't add the filename, so the layer from the previous example would export as *\_normal.png*.

## **ustwo Crop & Export +1px [filename] [layername]**

In this case the asset will have a 1px margin added to each edge so that it'll display correctly in Flash. File naming works as with the normal *Crop & Export*.

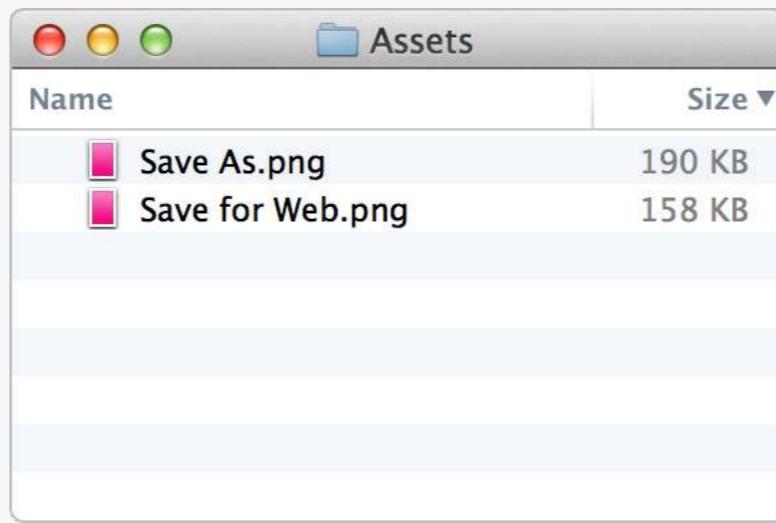
## **ustwo Crop & Export +1px [layername]**

Same as the previous script, just using the alternative naming method.

There are also a couple of additional scripts which won't crop the layers but will instead stick to the dimensions of the Photoshop file. This can be useful for things like screen comps, where the actual content might change size, but you want all the exported PNGs to have the same dimensions.

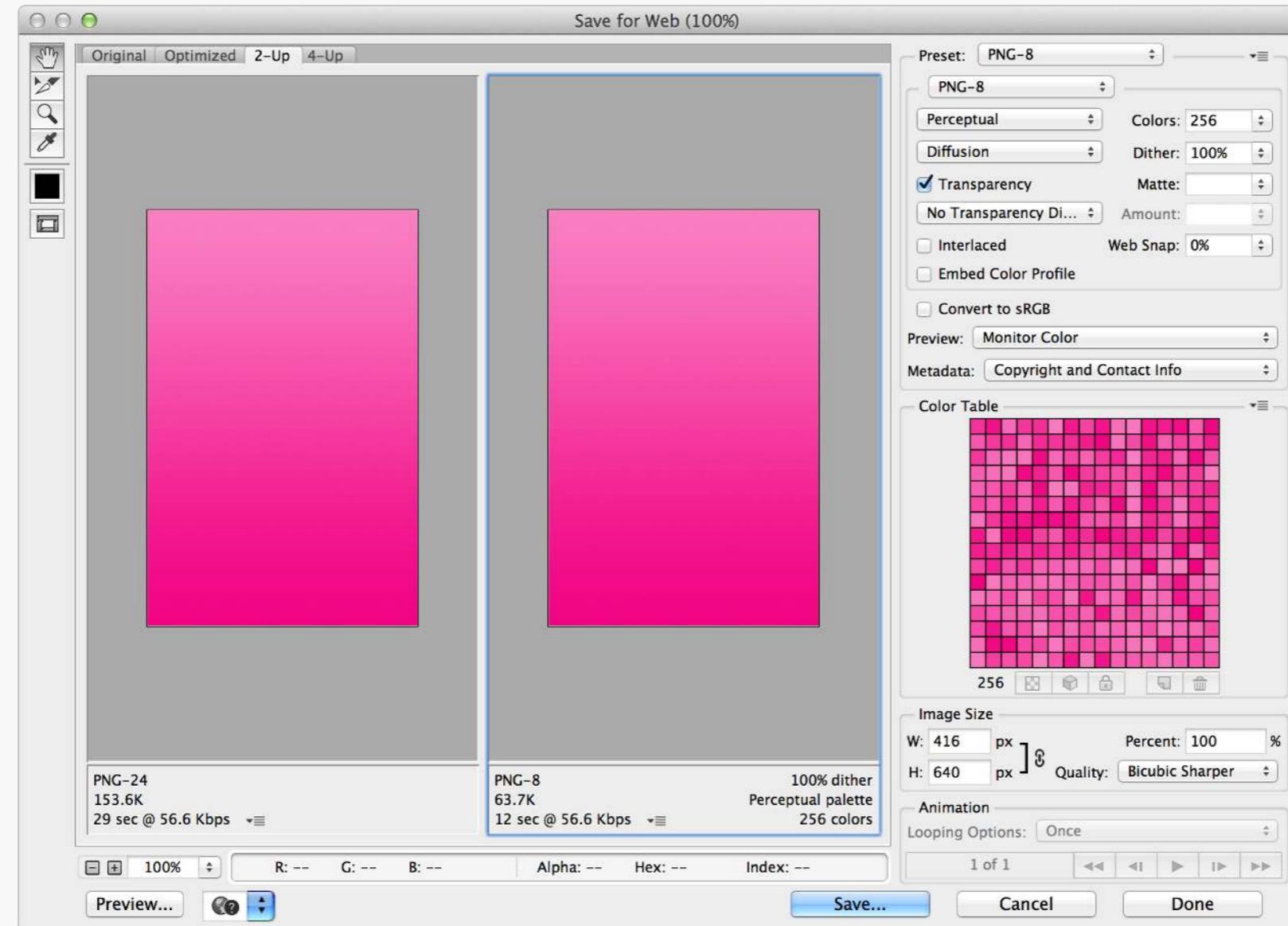
## **ustwo Export [filename][layername]**

## **ustwo Export [layername]**



## Save for Web

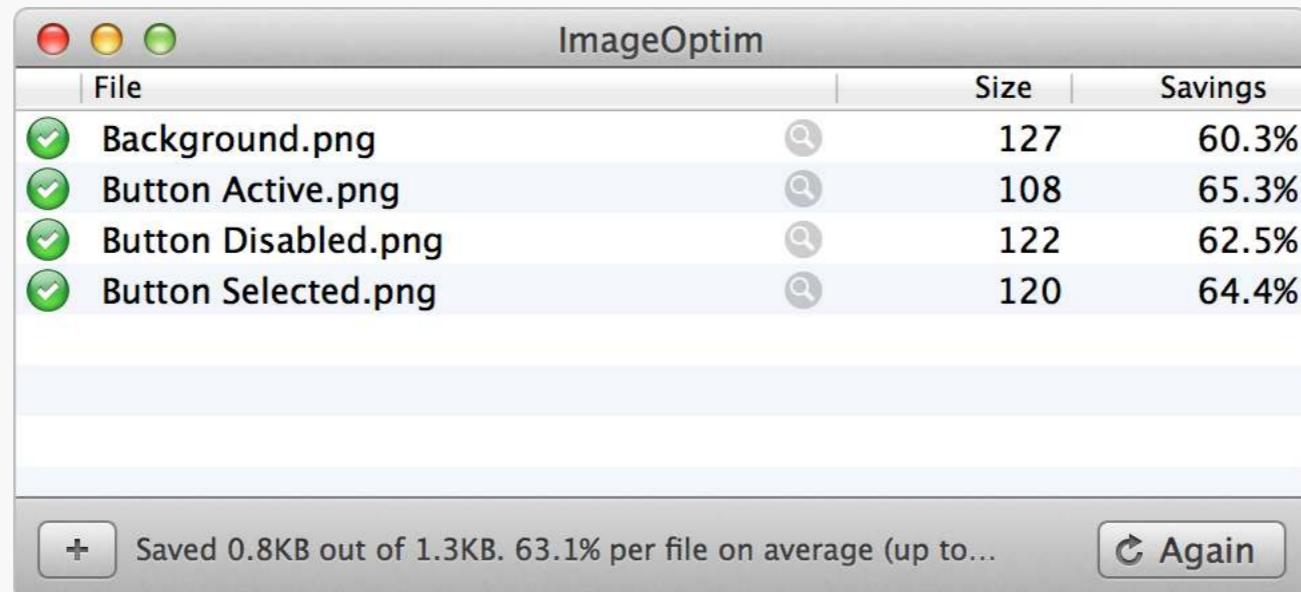
Check out the difference in file size for the two different PNGs here. *Save As...* has created a file that's 32KB bigger than *Save for Web*. Worth using the latter then.



## Reducing File Size

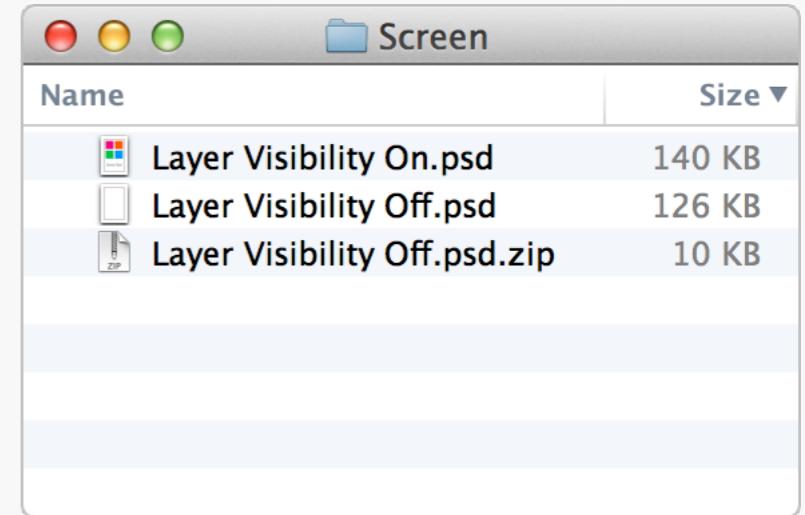
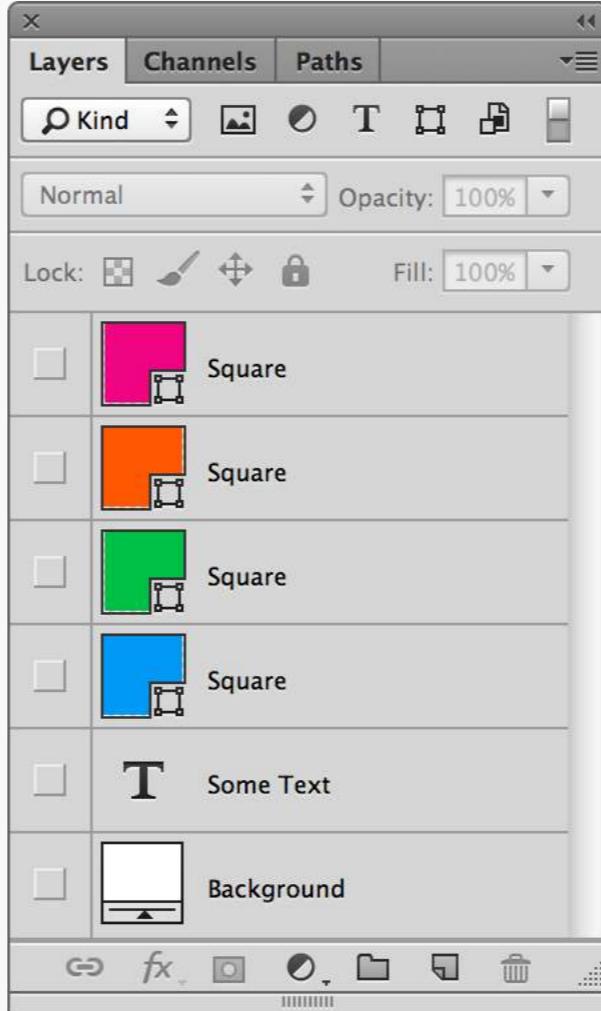
If you're exporting an asset that doesn't need transparency, try converting it to an 8bit PNG. In the example above there's no loss in quality from making the switch, but the file size has been more than halved.

# ImageOptim



**ImageOptim** can shave even more Kilobytes from your assets. Simply drag and drop your files on to the main window and watch as it does its thing. The app works on PNG, JPEG, and GIF images by stripping out any unnecessary metadata, such as comments

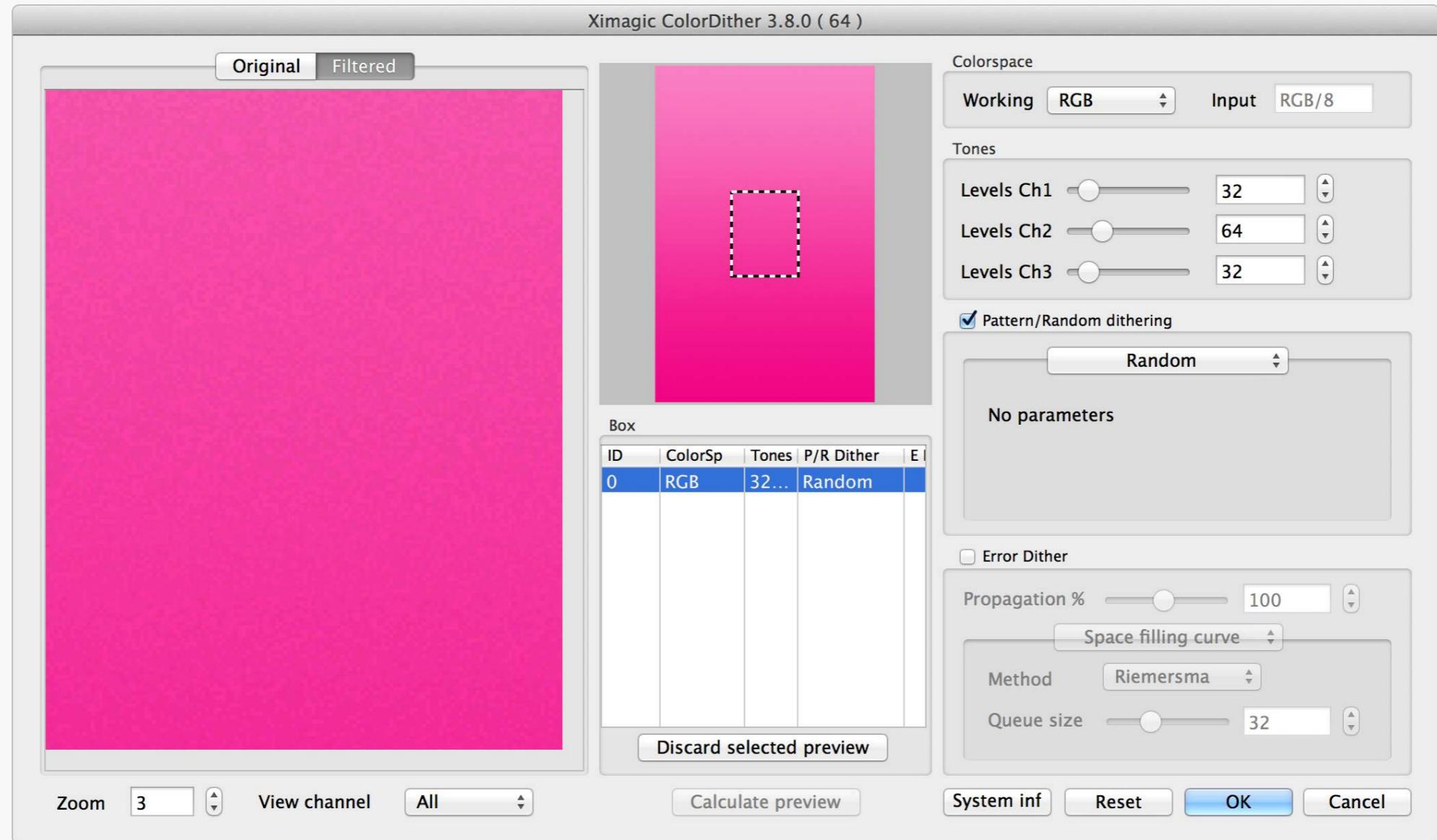
and colour profiles, as well as optimising the compression used. Worth noting though, that if you're developing for iOS, then it might not be worth using ImageOptim, as this article on [PNG compression and iOS apps](#) explains.



# Reducing Photoshop File Sizes

A quick way to knock some of the size from your PSDs is to hide all the layers. Not always practical if a design requires a certain visible combination to make sense, but it can be useful if you're sending files and want them as small as possible. Even better, use ZIP

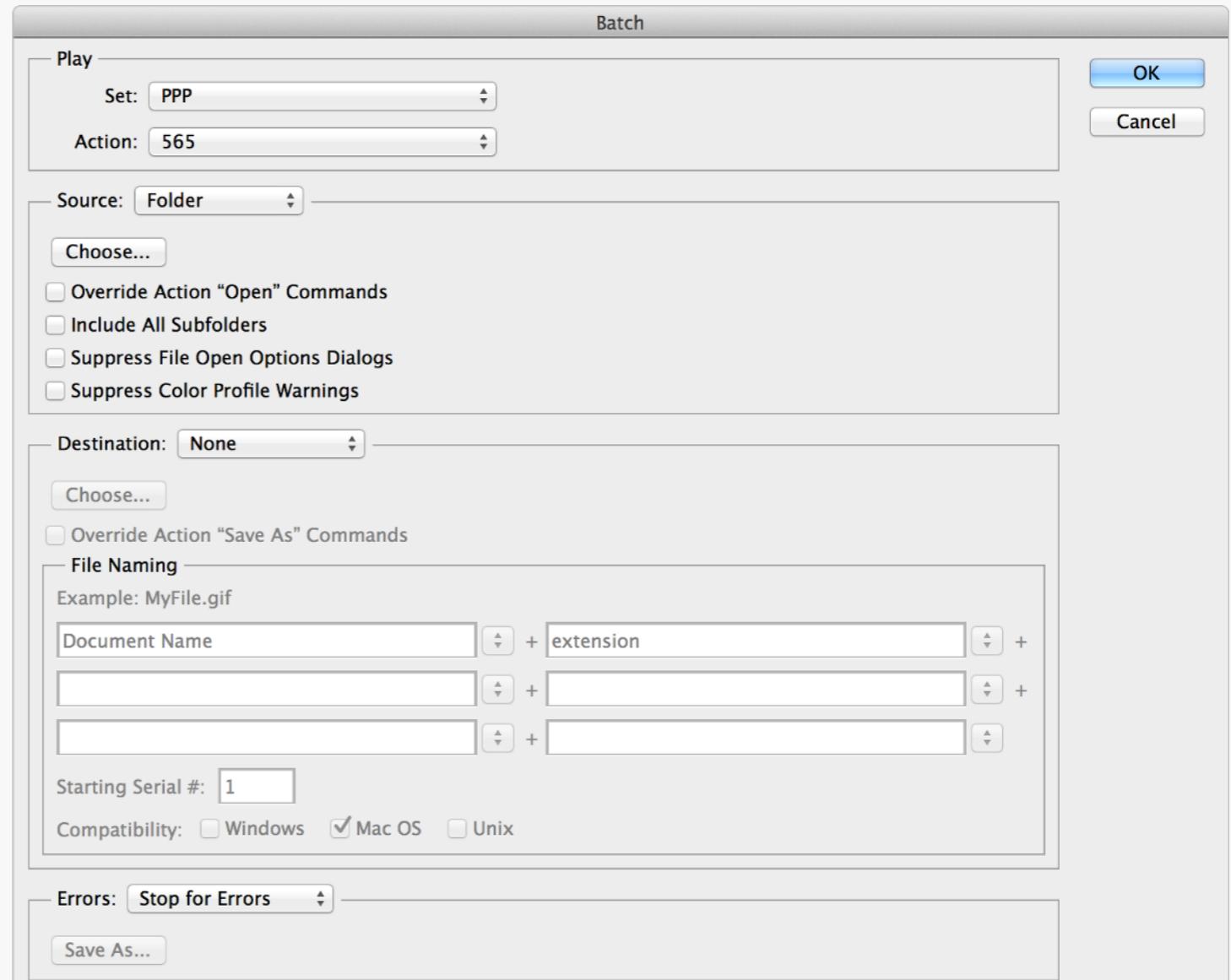
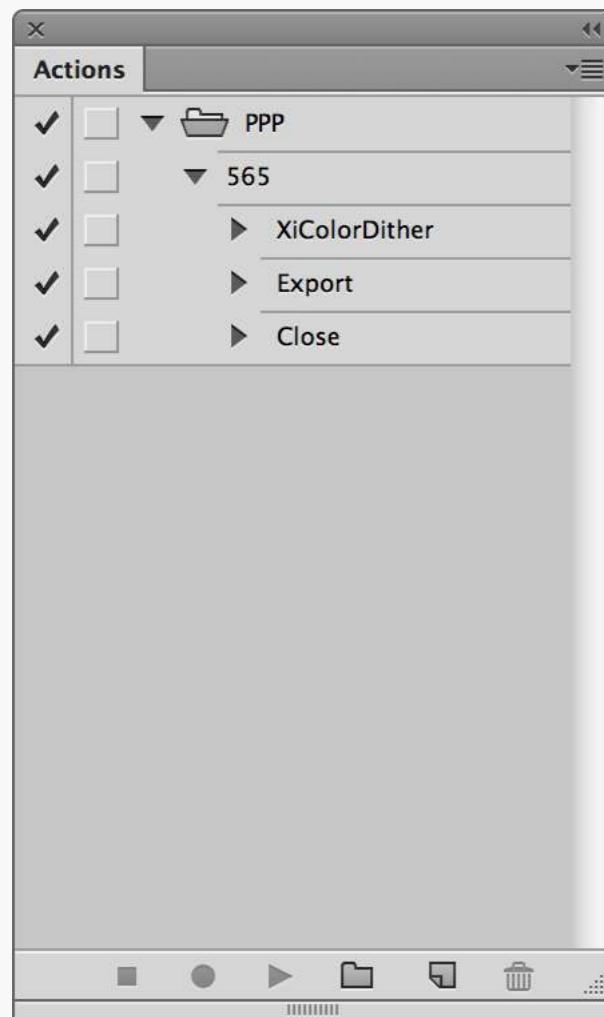
compression as PSDs can shrink down to less than 10% of their original size.



# 565

Some devices can't display as many colours as your computer screen, which may cause visual degradation of your assets — often most noticeable in gradients and transitions. To prevent this from happening convert them to 565 images using the [Ximagic ColorDither](#)

plugin. This reduces the bit depth from 24 bit to 16 bit (a commonly supported amount on older mobile screens) and applies dithering to counteract the reduction in colours. The 565 name comes from the 5+6+5 bits per channel of a 16 bit RGB image.

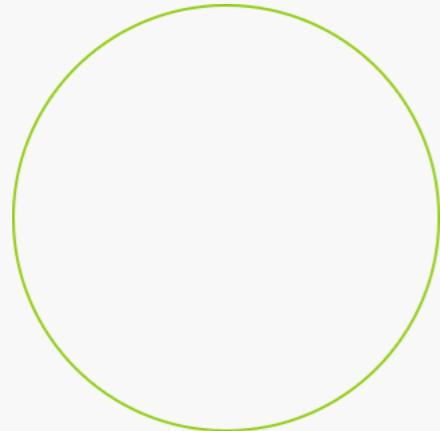


## 565 Batch

Running the 565 filter on a group of files is pretty laborious if you do them all individually, so automate the process using Actions and the Batch tool. Output all the assets as usual, then record an Action that applies the filter, exports the result using *Save for Web* (a better

option than *Save and Close* in the *Destination* menu, which increases the file size), and closes the file without saving. Afterwards, simply run the Action in the Batch tool with the settings as above. All the filtered files will be exported to the original *Save for Web* folder.

Photoshop  
**TIPS**



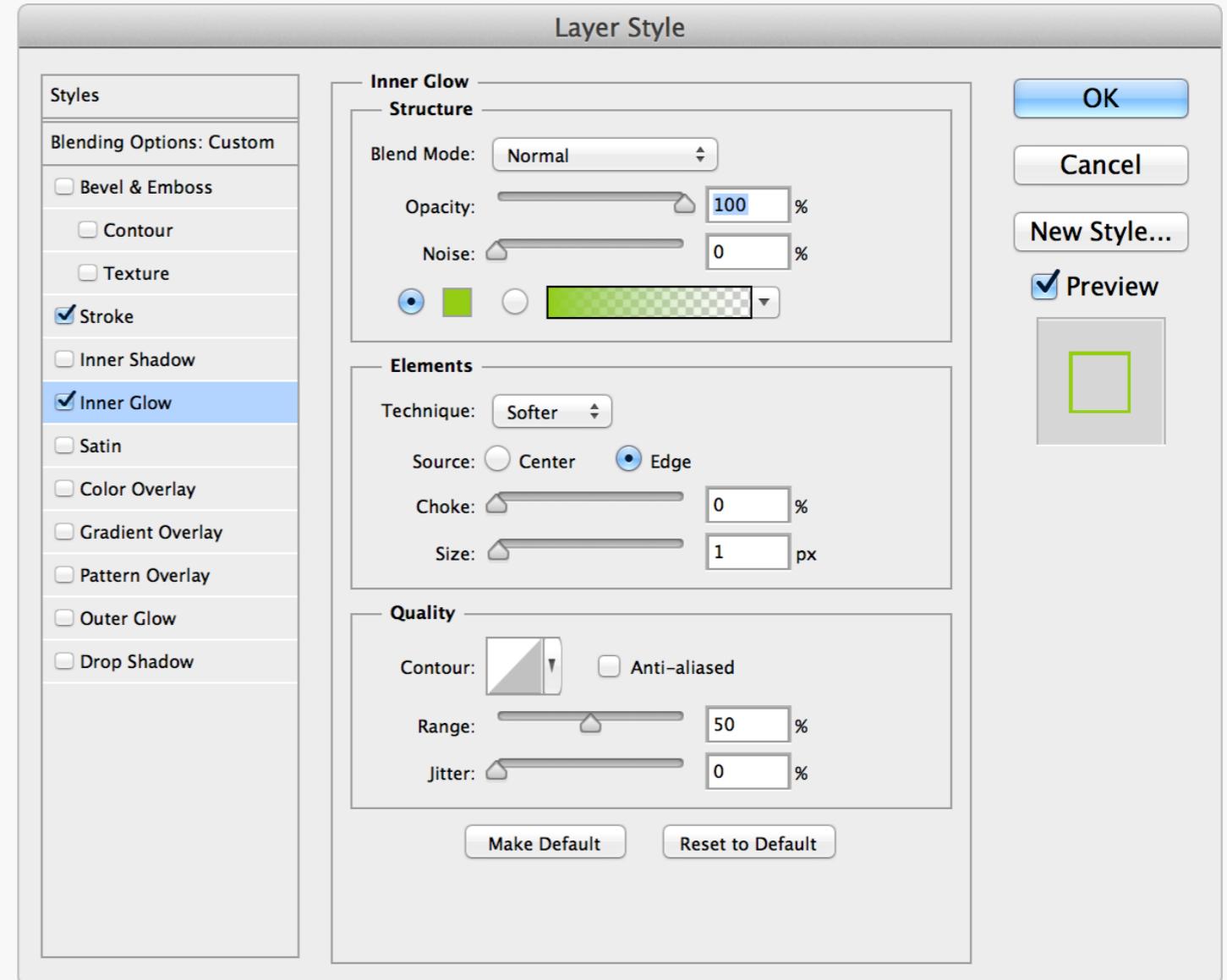
No Glow

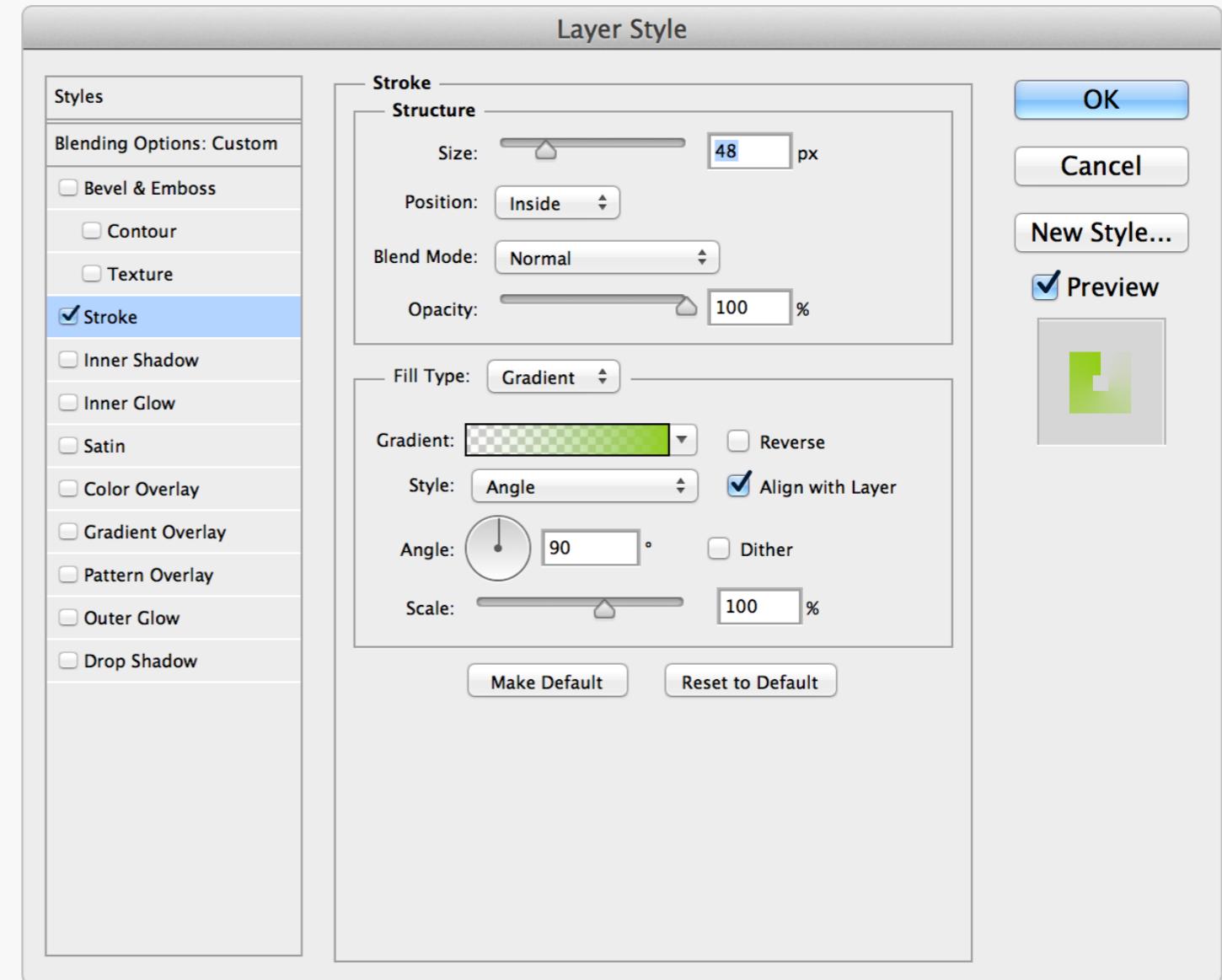


Glow

## Strokes

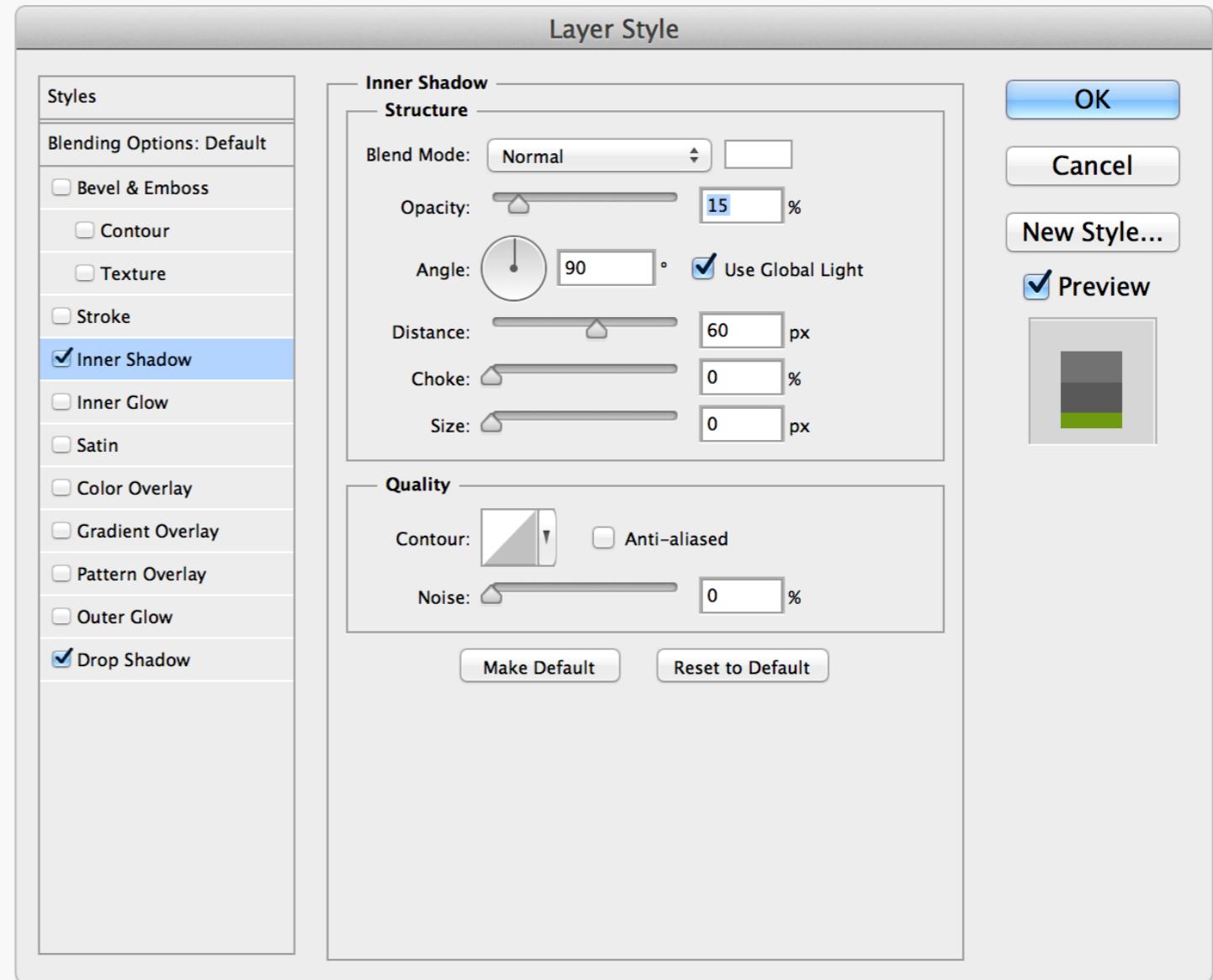
Occasionally 1px strokes can look a little too thin and wispy on curved edges. To strengthen them without increasing their thickness add a Glow using the settings above. The difference is subtle, but it definitely helps.





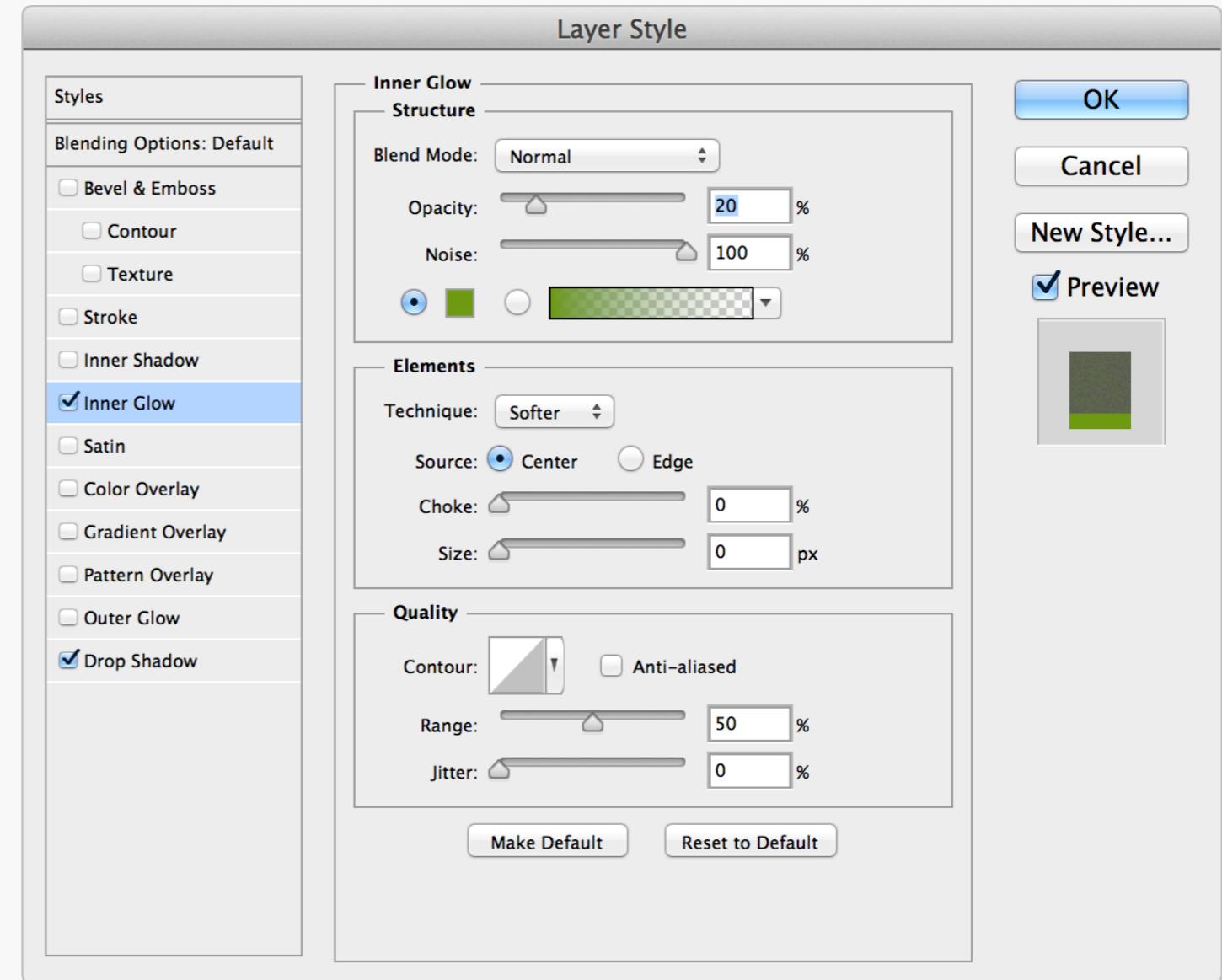
## Fading Circles

Circular fades are really easy to make with the *Stroke Effect*. The trick is to use *Fill Type: Gradient* and *Style: Angle*.



## Quick Shine

If you want to quickly add a shine to an object, try using the *Inner Shadow* Effect with a low opacity white. Be careful though, as its shape will be based on the top edge of the parent layer, meaning any non-straight sections will be replicated in the shine.



## Add Noise with Inner Glow

It's possible to add a simple noise texture to an object using the *Inner Glow* Effect. Set the *Source* to *Center* and *Size* to *0*, then vary the amount using the *Noise* setting.



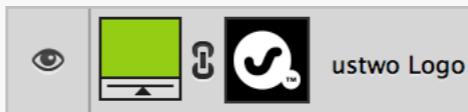
Grab a flat bitmap logo on a white background from somewhere



*Image > Adjustments > Invert then Select All and Copy*



*Image > Adjustments > Desaturate*



Create a new *Solid Color* layer, add a *Layer Mask*, *Option + click* on it and then *Paste* — this masks the layer using the black and white logo you copied in the previous step



*Image > Adjustments > Levels* and use the black point eyedropper to select the main grey colour

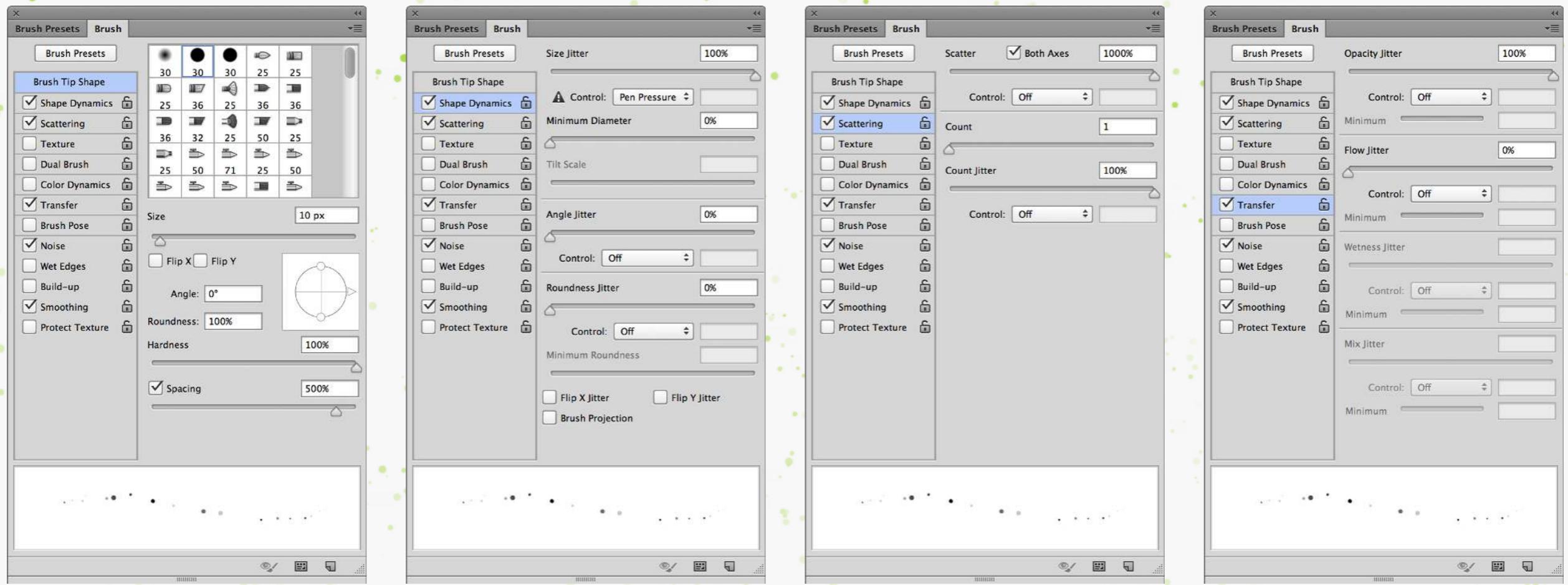


Ta-da! You now have a logo on a transparent background

## Extracting Logos

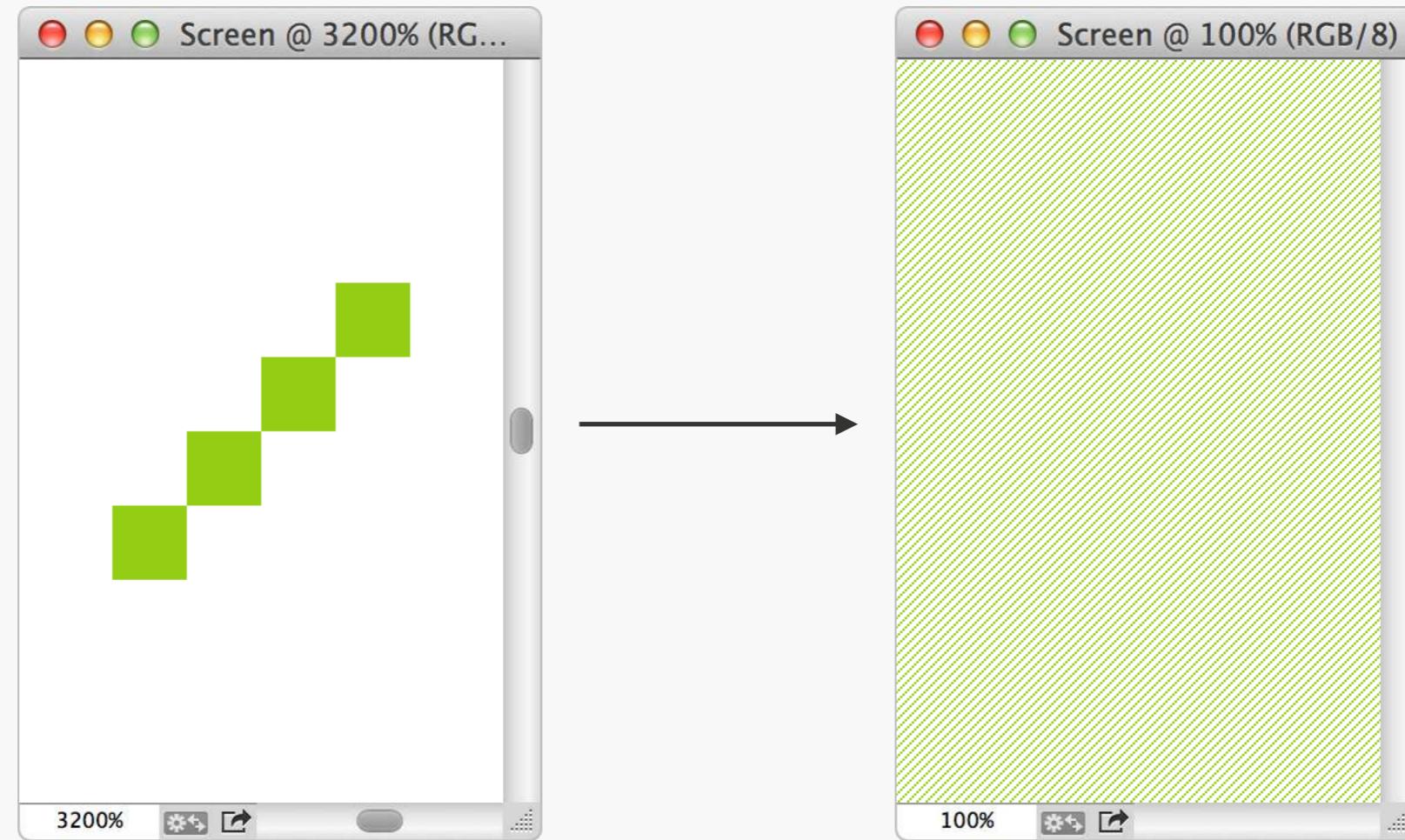
Sometimes it can be difficult to obtain a decent copy of a logo, in which case try using this process as a last resort. Another useful tip is to search a company's site to see if they have any PDFs available for download. You can

open these up in Illustrator and grab any vector logos they might contain.



## Star Fields

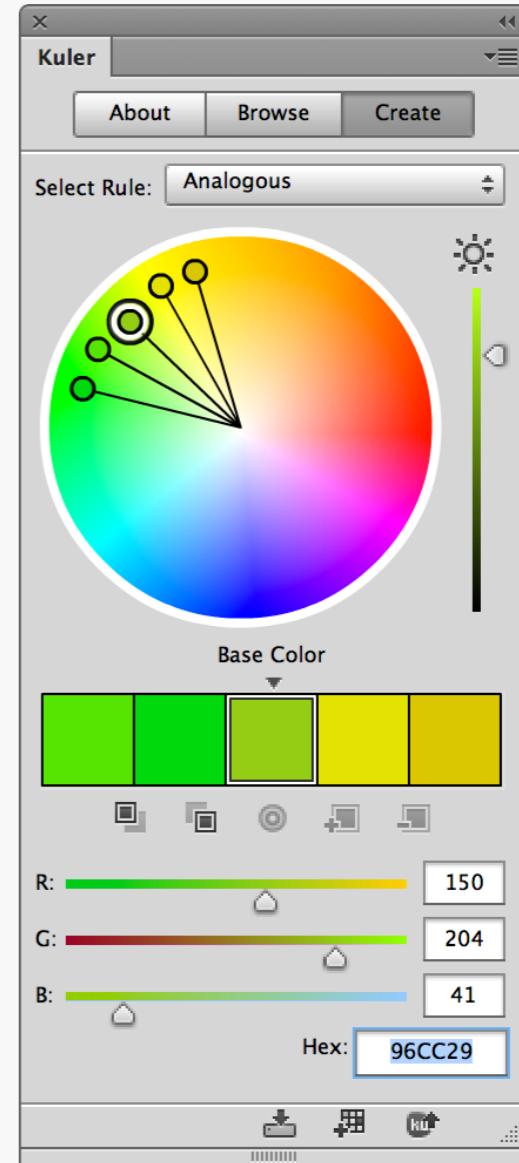
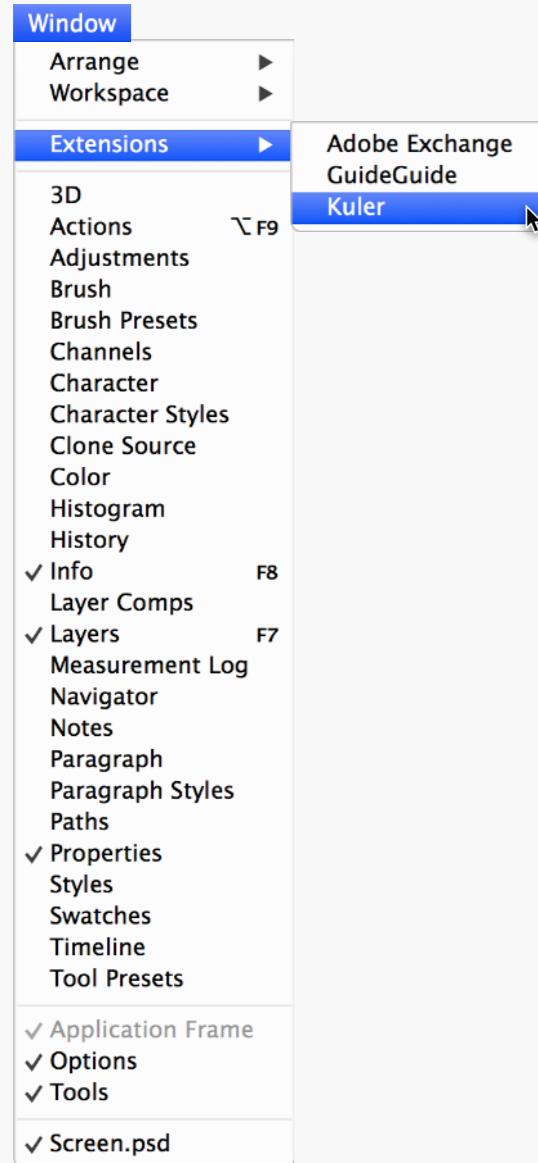
Play around with the settings in the *Brushes* panel to create some different effects, for example a basic star field. By increasing the *Size Jitter* and *Opacity Jitter* the brushes become more random.



## Patterns

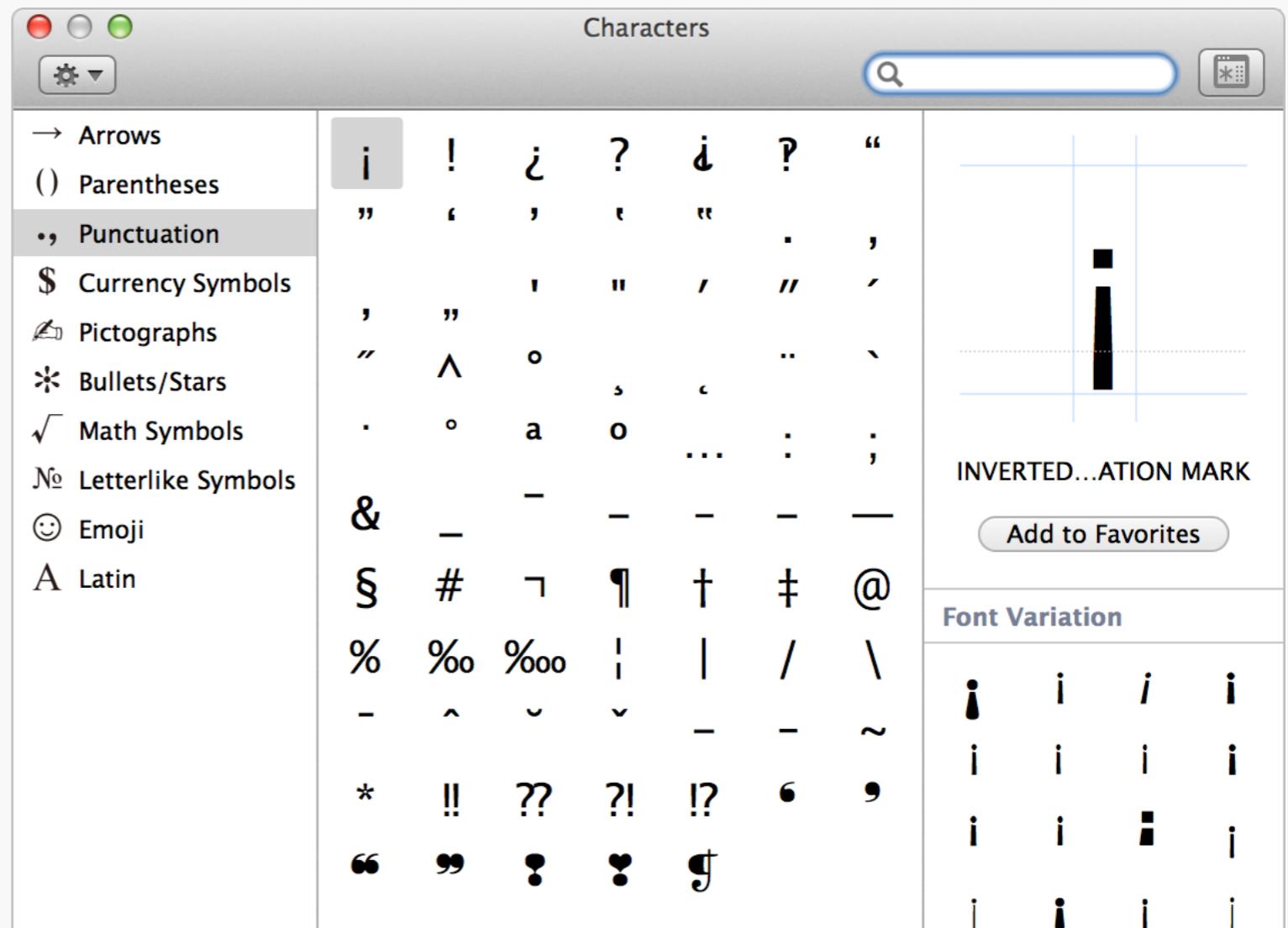
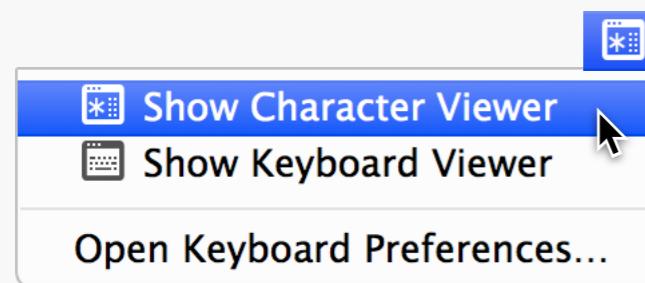
Add a little something to your designs by including a pattern or texture. They're simple enough to make in Photoshop: first, draw a tile that seamlessly repeats, then drag a selection around it, and finally go to *Edit > Define Pattern...* to save it as a preset. The new

pattern can then be used throughout the app, including the Layer Style panel. Don't just add it on top of everything else as a solid layer either. Experiment with Blend Modes and Opacity to change how the pattern interacts with the underlying design.



# Kuler

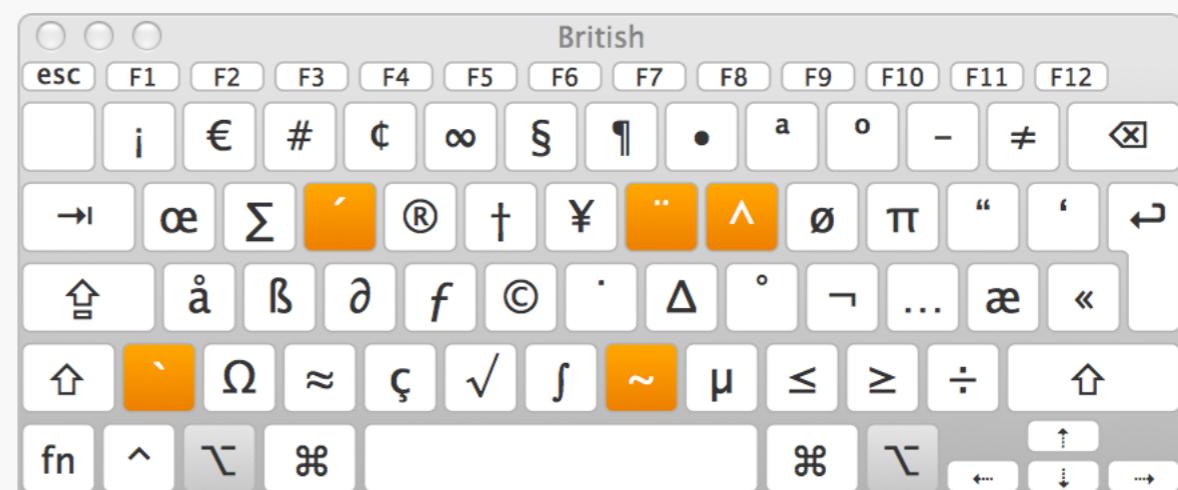
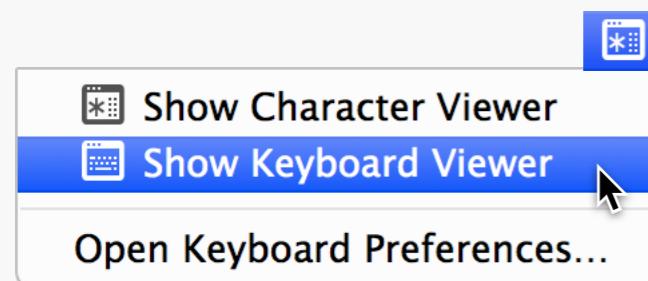
Feeling a bit uninspired when it comes to colours and palettes? Then give [Kuler](#) a go. This handy Photoshop extension allows you to browse through and interact with user-generated colour schemes, as well as create your own. Beautiful!



## Character Viewer

Mac OS X includes a couple of helpful type tools, found in the menu bar option that appears after activating *Show Keyboard & Character Viewers in menu bar* in *System Preferences > Keyboard*. The first in the pair, Character Viewer, will help you find lesser

known glyphs in a typeface. To use it, make sure you've got a text box active in Photoshop (or any other app) and double-click the character you want to insert. If nothing appears it means the typeface you've got selected, doesn't have that option available.



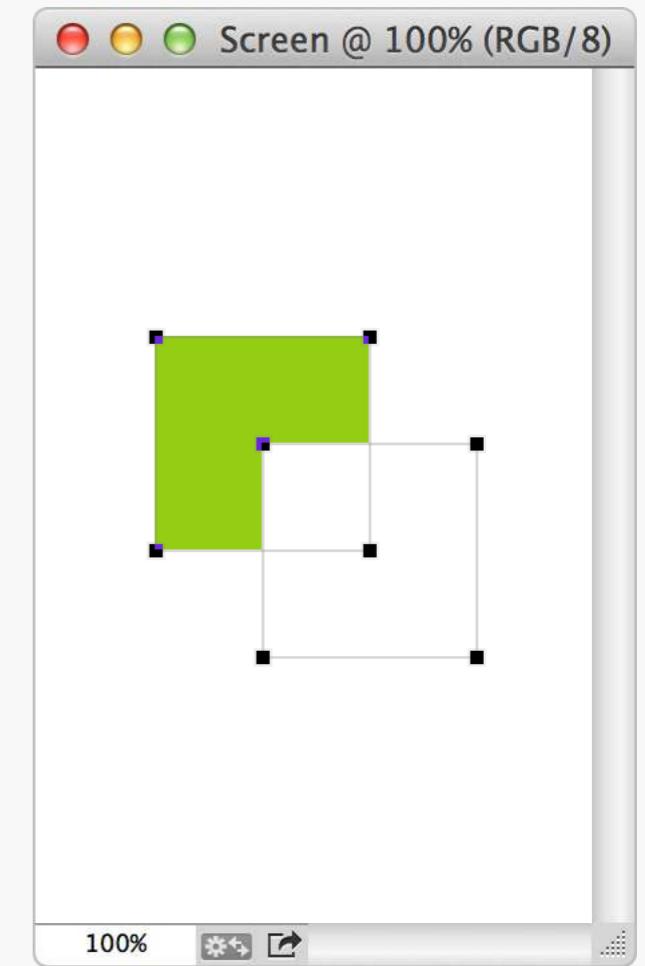
# Keyboard Viewer

Character Viewer's little brother is Keyboard Viewer, a simpler app that shows you all the letters and symbols available from the keyboard. Clicking on a key with a text box active, inserts that character; hold down modifiers like *Shift* and *Option* to see all the

other options available. It's a great way of learning how to type accents and symbols directly from the keyboard.

# Shortcuts Paths

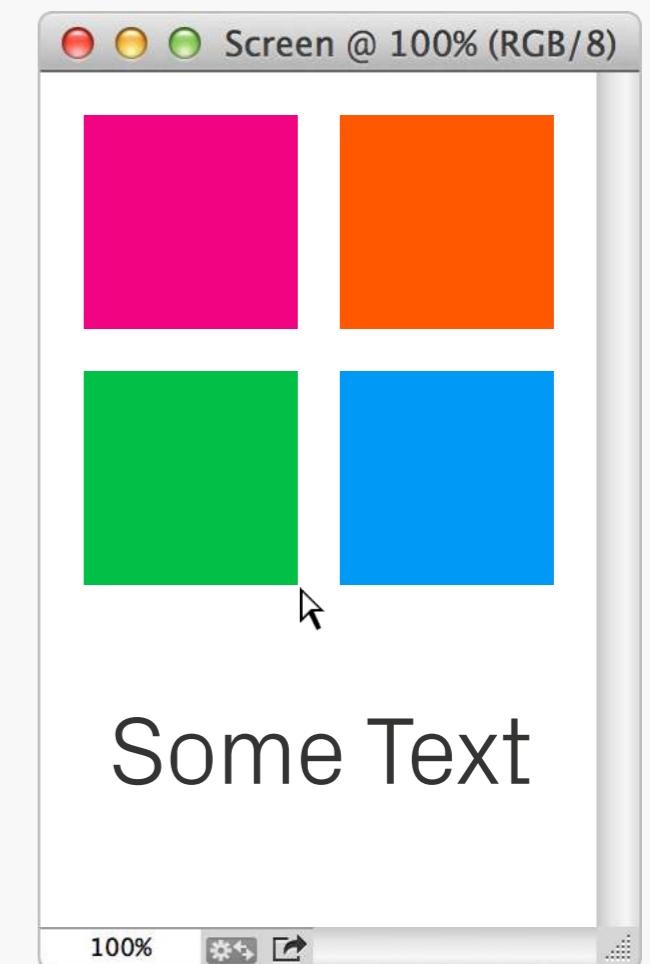
There are loads of shortcuts available for the path tools to speed up their operation. Combine the paths of two existing Shape Layers by selecting them and hitting *Command + E*. After drawing a path, add another to it by pressing  $+$  (*plus*) or holding



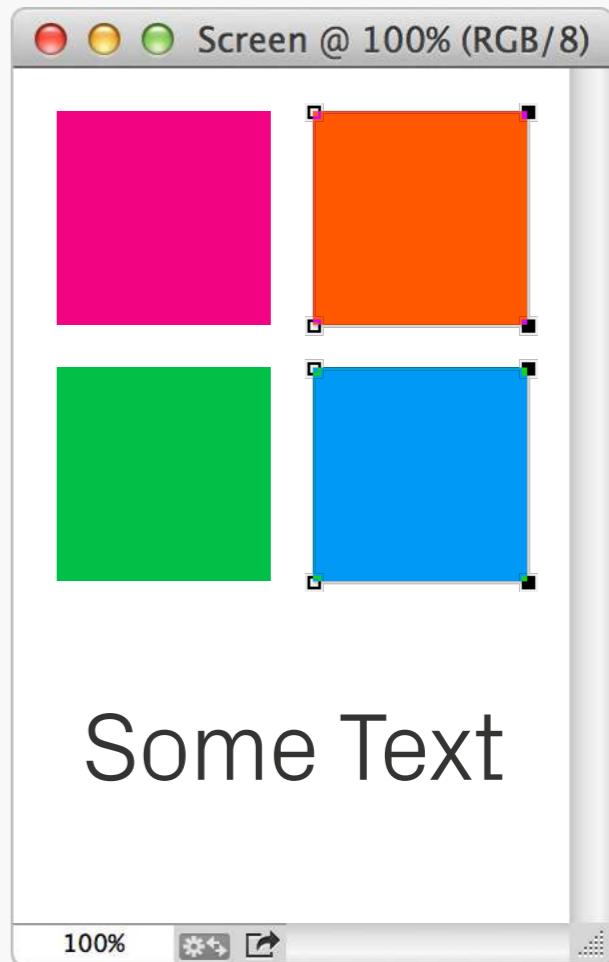
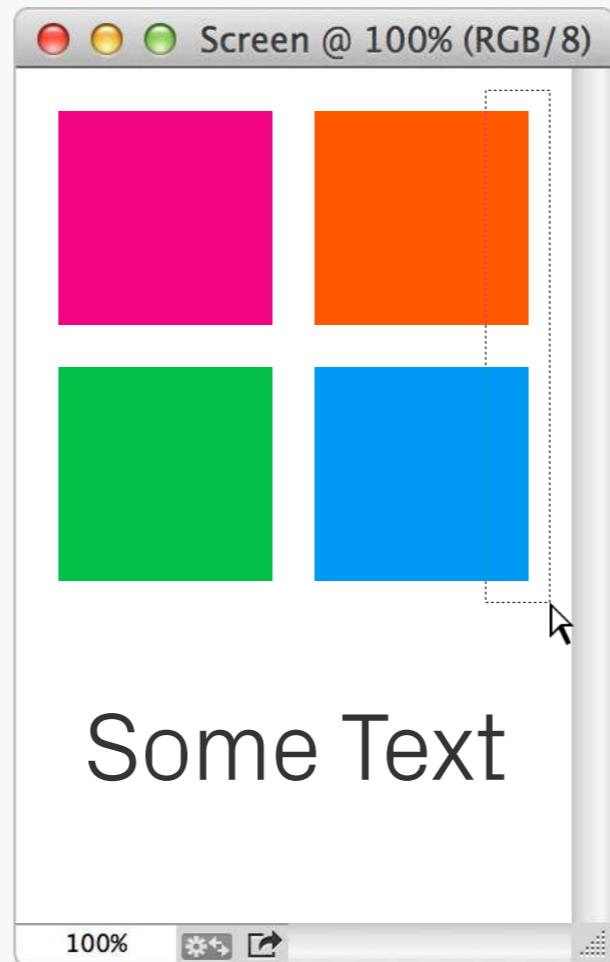
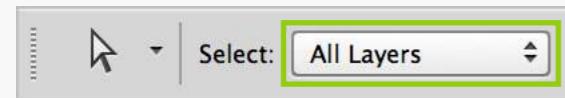
down *Shift*; alternatively – (*minus*) or *Option* will subtract from the shape. Once drawn, add and subtract the new path from the original by selecting it and pressing – (*minus*) or  $+$  (*plus*).

# Shortcuts Paths

If you're editing a path with the Direct Selection Tool and don't want to accidentally select other Shape Layers in the document, then tap *Q* to enter Quick Mask Mode, which isolates the one you're currently working on.



# Shortcuts Paths



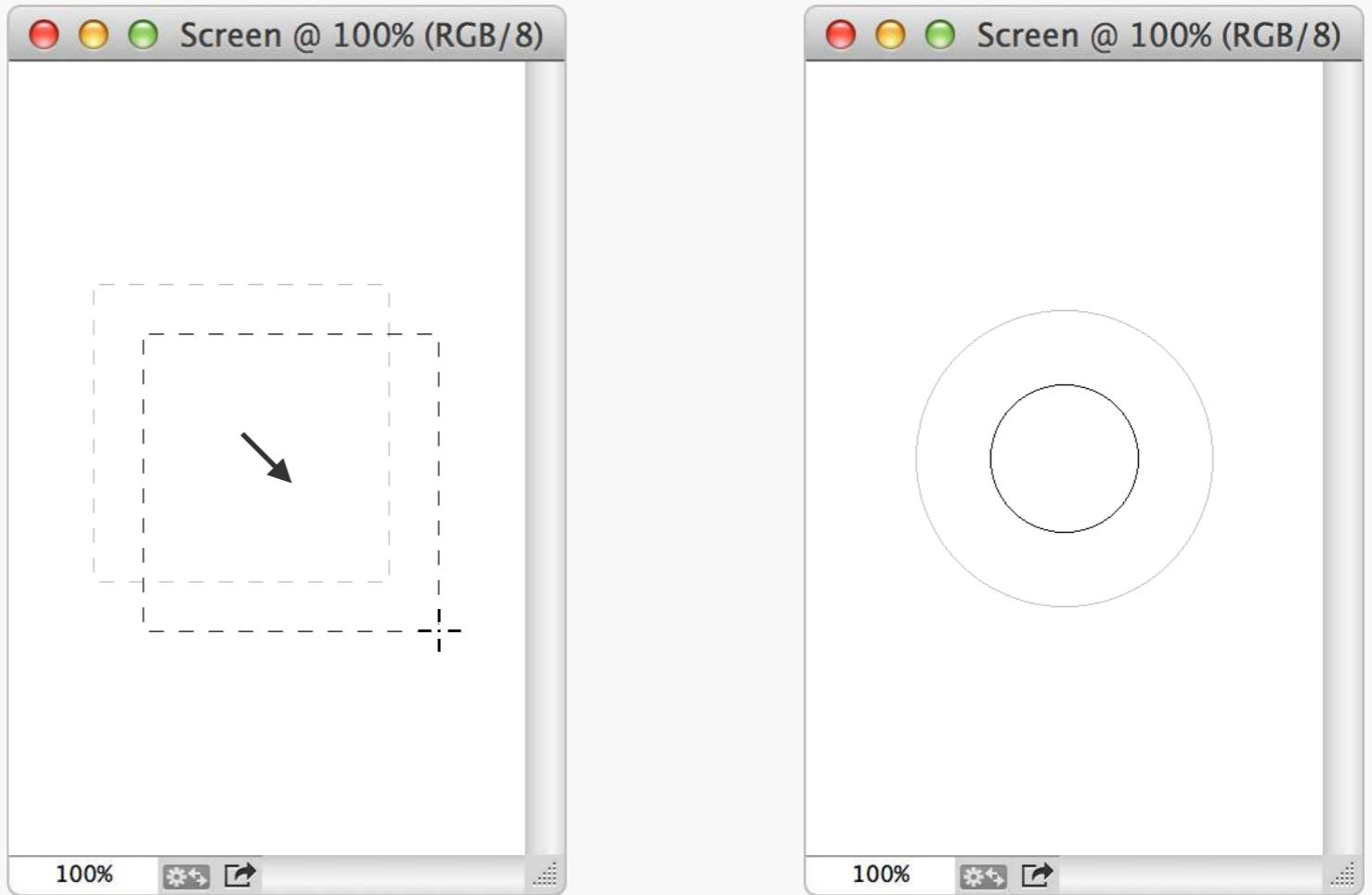
Photoshop CC includes updates to the way the Direct Selection tool interacts with paths, making them easier to edit. With *Select: All Layers* chosen in the *Options* bar you can now click and drag to select multiple points over multiple layers, allowing changes to more than

one shape at once. Double-clicking on a path will isolate it, with another double-click exiting that mode.

# Shortcuts

## Selections and Brushes

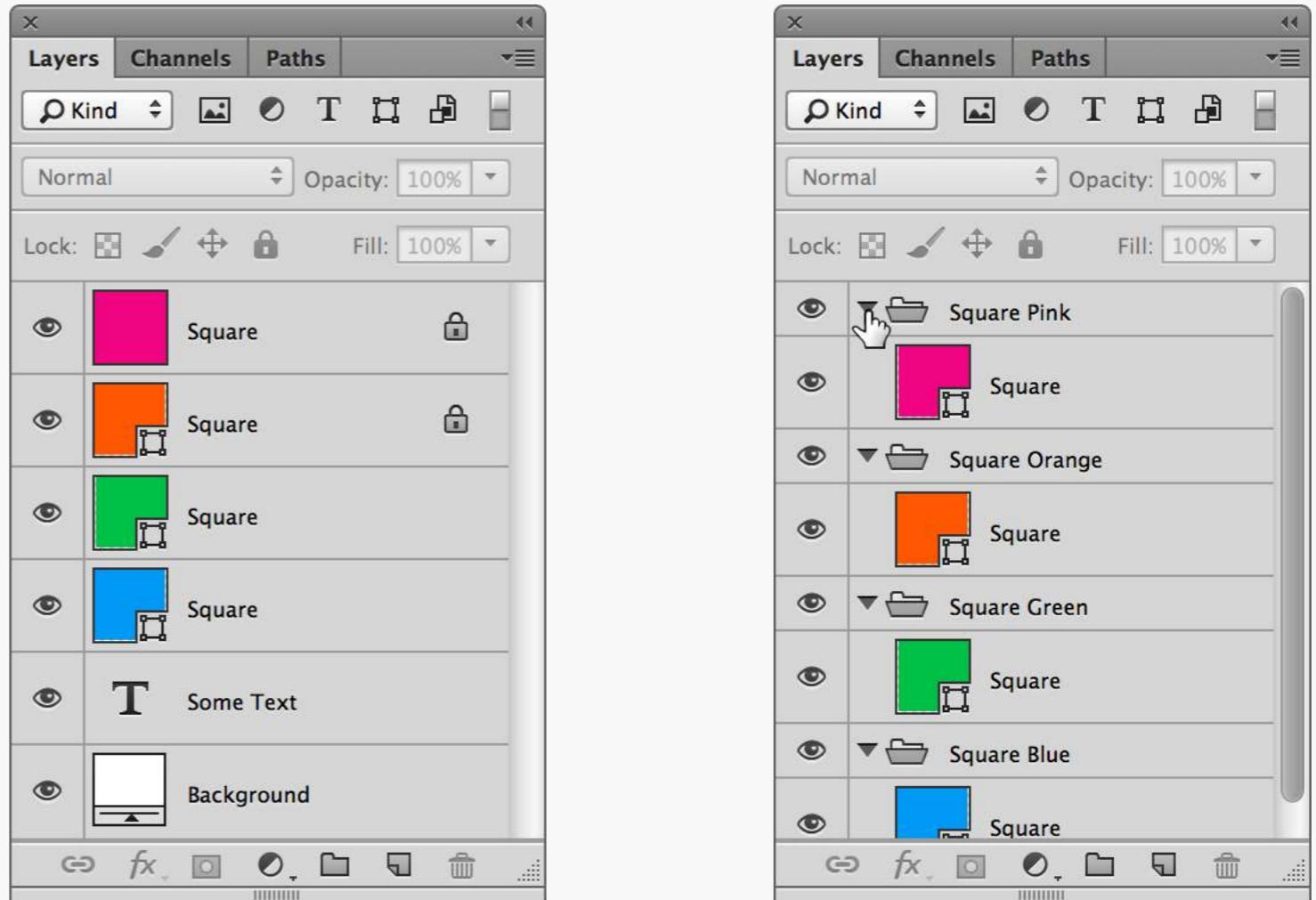
When creating a selection, hold down the *Space* key to move its original point around.



Use the square bracket keys, [ and ], to adjust the brush size up and down. *Shift* + [ or ] will increase or decrease the brush hardness.

# Shortcuts Layers

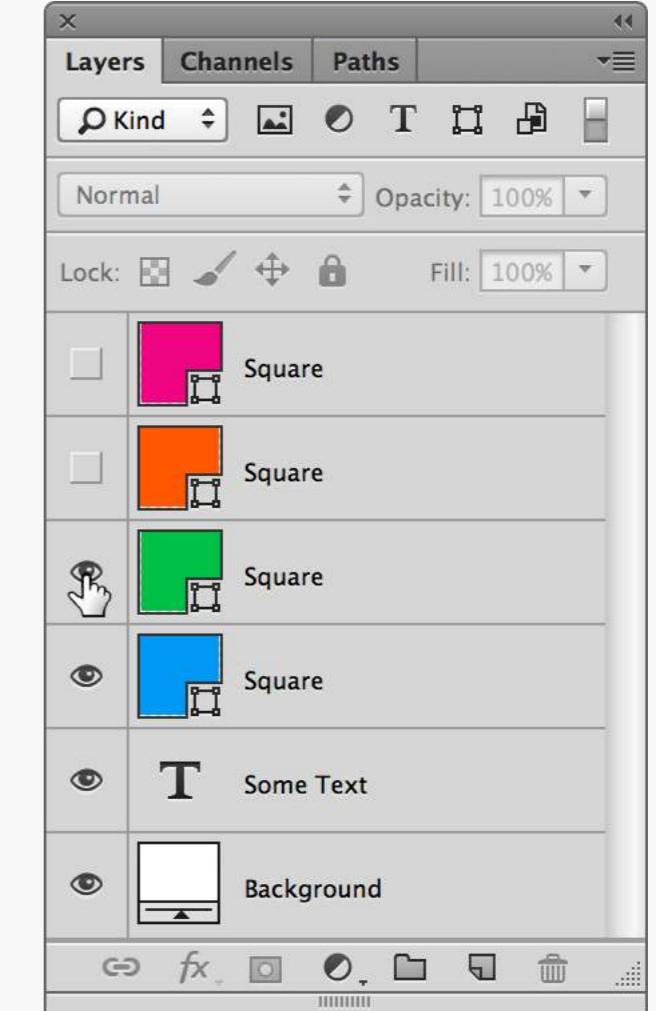
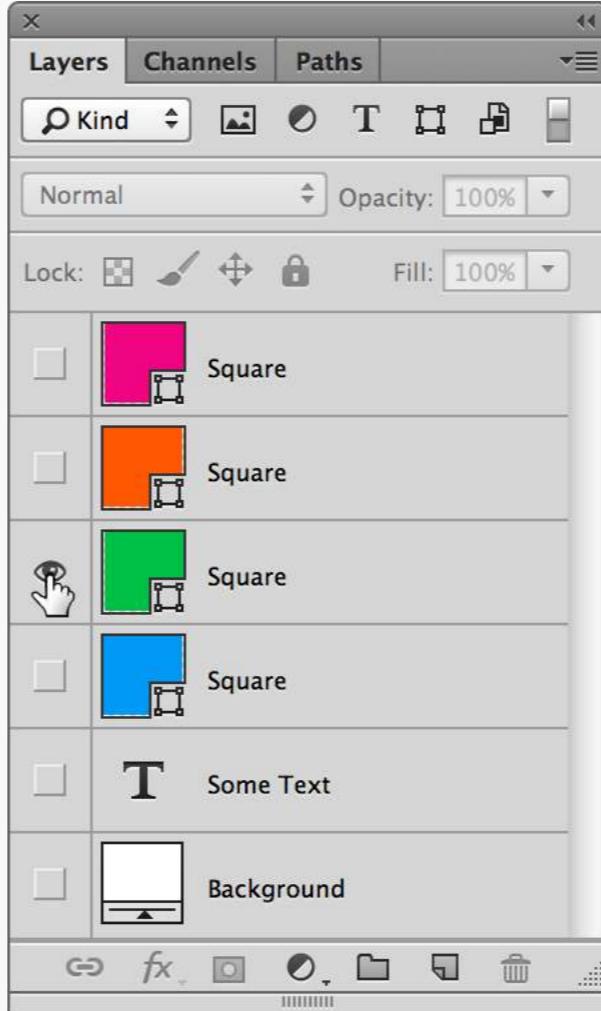
Select a layer and press the forward slash / key to lock its transparency. On Shape Layers, this will lock the position instead.



Collapse or expand all layer sets in a document by holding down the *Command* key and clicking on one of the accordion icons.

# Shortcuts Layers

To hide all but one layer, hold down *Option* and click its visibility icon.



To show or hide layers in a row, click, hold down, and drag the cursor across all the relevant visibility icons.

# Shortcuts

## Keyboard

<b>Cycle screen modes (F)</b> Switch between normal, fullscreen with task bar, and full screen with black background.	<b>Move selection outline (Shift + Arrow keys)</b> Moves selection outline by 10px.
<b>Hand tool (Space)</b> Temporarily selects the hand tool while held down, use to pan around an image.	<b>Move selection (Command + Arrow keys)</b> Moves selected layer or area by 1px.
<b>Cycle open documents (Command + `)</b> Acts like <i>Command + Tab</i> in the OS, navigating between open documents.	<b>Move selection</b> <i>(Command + Shift + Arrow keys)</i> Moves selected layer or area by 10px.
<b>Canvas background (Space + F)</b> Cycles through canvas colours.	<b>Select all layers (Command + Option + A)</b> Selects all layers in the Layers panel.
<b>Switch colours (X)</b> Flips the foreground and background colours.	<b>Load layer as selection</b> <i>(Command + click layer thumbnail)</i> Load layer transparency as a selection.
<b>Default colours (D)</b> Resets foreground and background colours to black and white.	<b>Enable/disable layer mask</b> <i>(Shift + click layer mask)</i> Switch layer mask on and off.
<b>Move selection outline (Arrow keys)</b> Moves selection outline by 1px.	<b>View mask (Option + click layer mask)</b> Show the layer mask as a separate image, which can be edited like a channel.

# Shortcuts

## Keyboard

### **Load mask as selection**

(*Command + click mask*)

Loads up the mask as a selection.

### **Invert selection** (*Command + Shift + I*)

Inverts the selection, so previously selected areas become deselected and vice versa.

### **Deselect** (*Command + D*)

Removes current selection.

### **Reselect** (*Command + Shift + D*)

Reloads the last selection.

### **Copy layer** (*Command + J*)

Duplicate the currently selected layer.

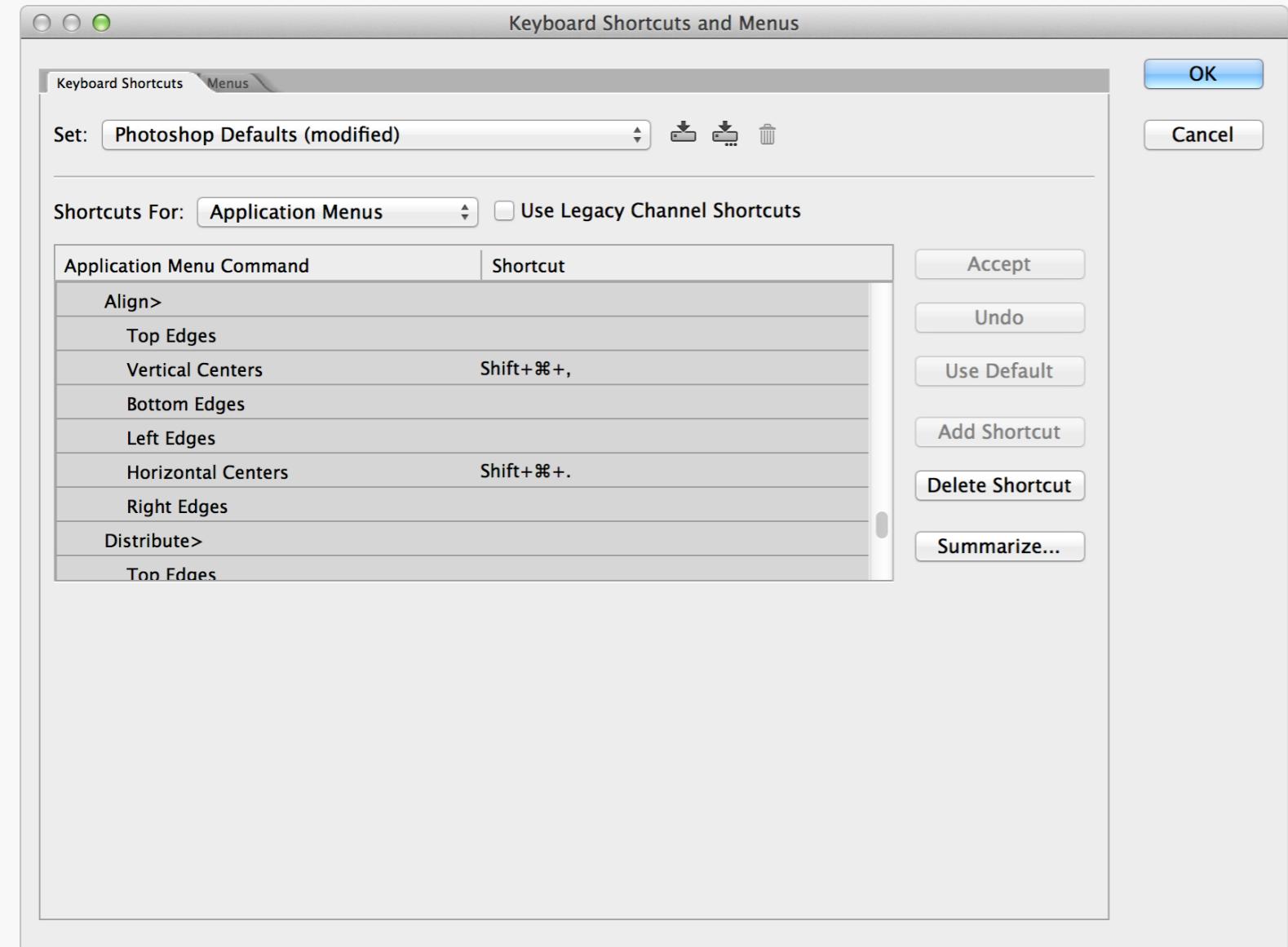
### **Change layer opacity** (*1–0 keys*)

Adjust the layer's opacity in 10% increments.

### **Cycle blending modes**

(*Shift + + (plus) or – (minus)*)

Cycle through layer blending modes.



# Keyboard Shortcuts and Menus

Become a Photoshop lean machine by creating custom keyboard shortcuts with the *Edit > Keyboard Shortcuts...* dialog. The window above shows a couple of new ones assigned to *Align > Vertical Centers* and *Align > Horizontal Centers*, which are common

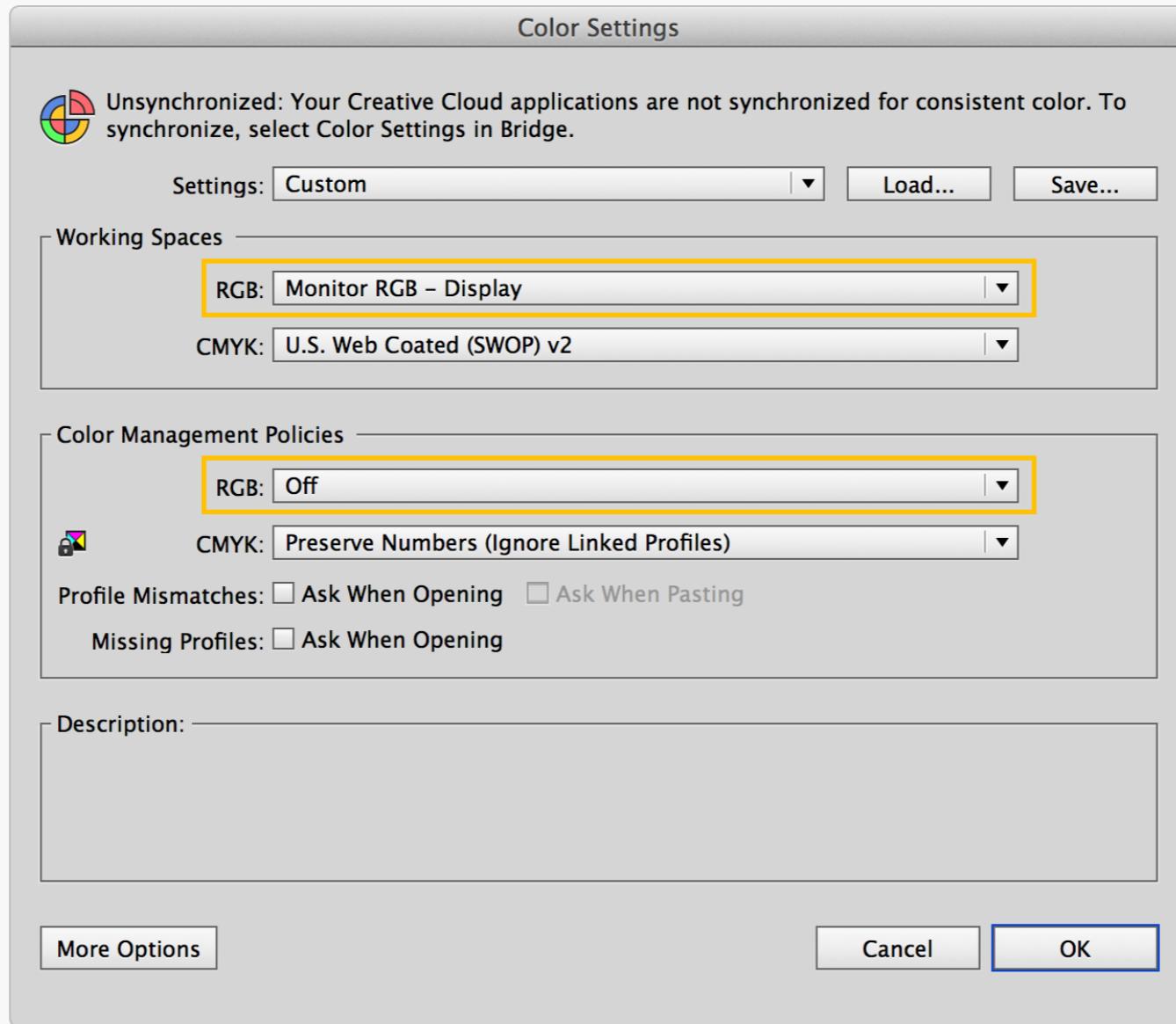
interface design tasks. Another really neat thing to do is remove the *Command + Q* shortcut to prevent yourself from accidentally quitting Photoshop.

# ILLUSTRATOR



## Introduction

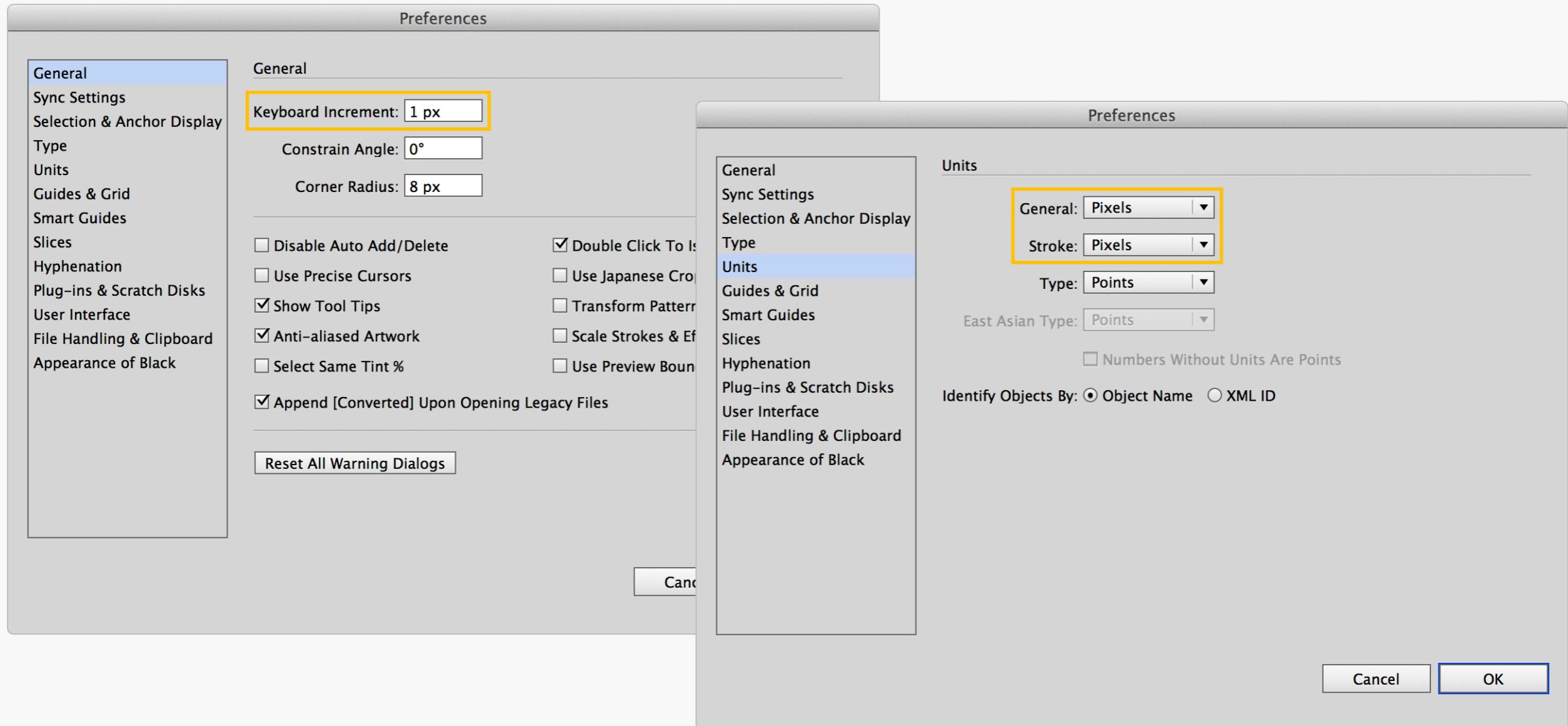
Illustrator: deploy when Photoshop's vector tools just aren't quite up to the task. We tend to use it for creating complex shapes which are then styled in Photoshop. That way they retain their versatility but have access to a wider range of effects.



# Illustrator Colour Settings

It's worth setting up Illustrator's colour profiles properly as well. For example, you might want to add some colour to vector sketches which match a design in Photoshop. As with its sibling, go to *Edit > Color Settings...*, make sure *Working Spaces > RGB* is set to *Monitor*

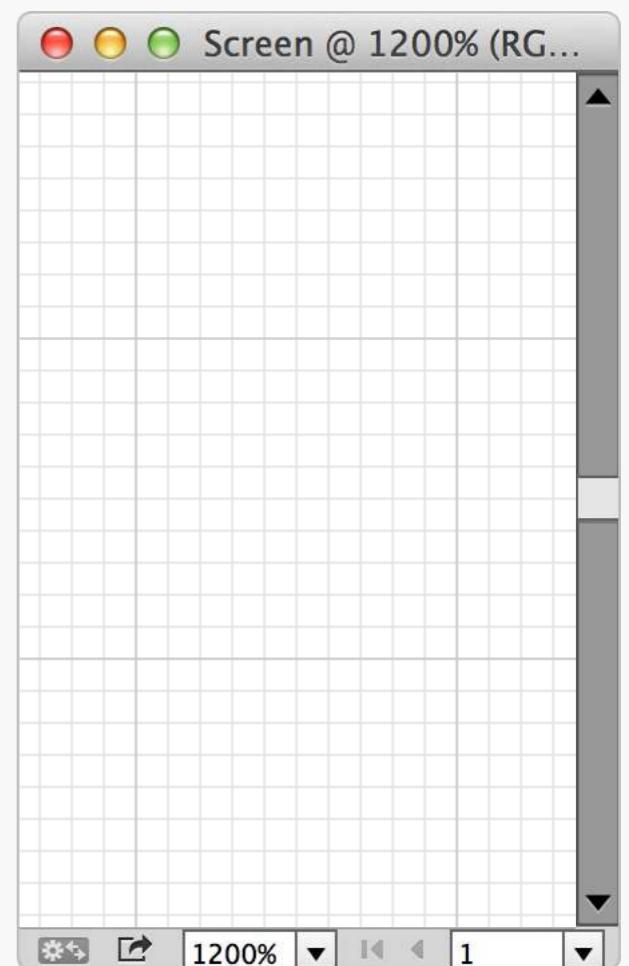
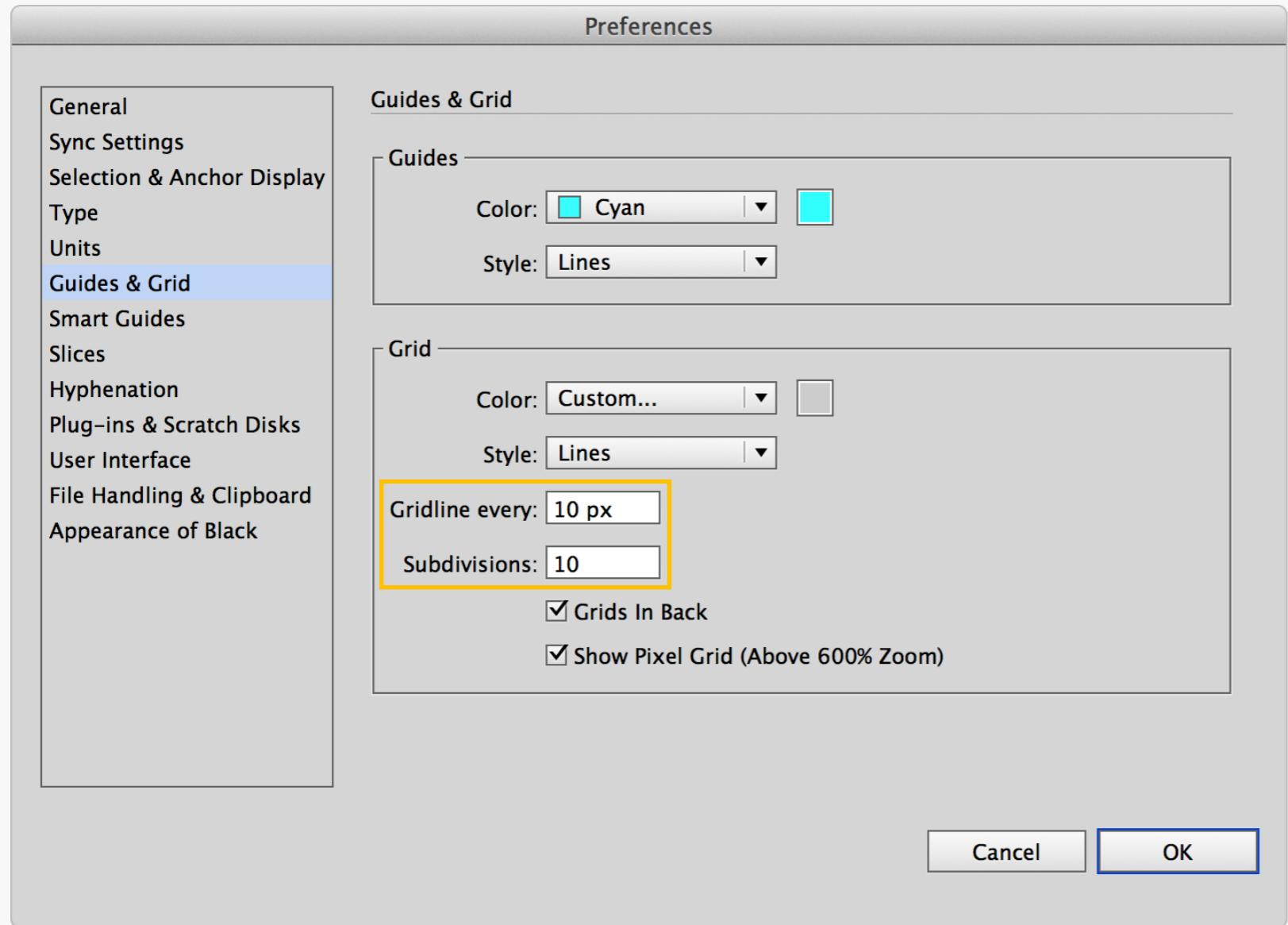
*RGB – Display and Color Management Policies > RGB is Off.*



# Preferences

There's a couple of changes you can make in Illustrator's Preferences to improve its pixel precision. The first, is setting the keyboard increments to 1px so the cursor keys will nudge shapes and points around by whole pixel measurements. Once this is done, switch

to the *Units* section and set *General* and *Stroke* to *Pixels*, which means all your dimensions will now be pixel-based. Since digital type is often still measured in *Points* — that setting remains untouched.

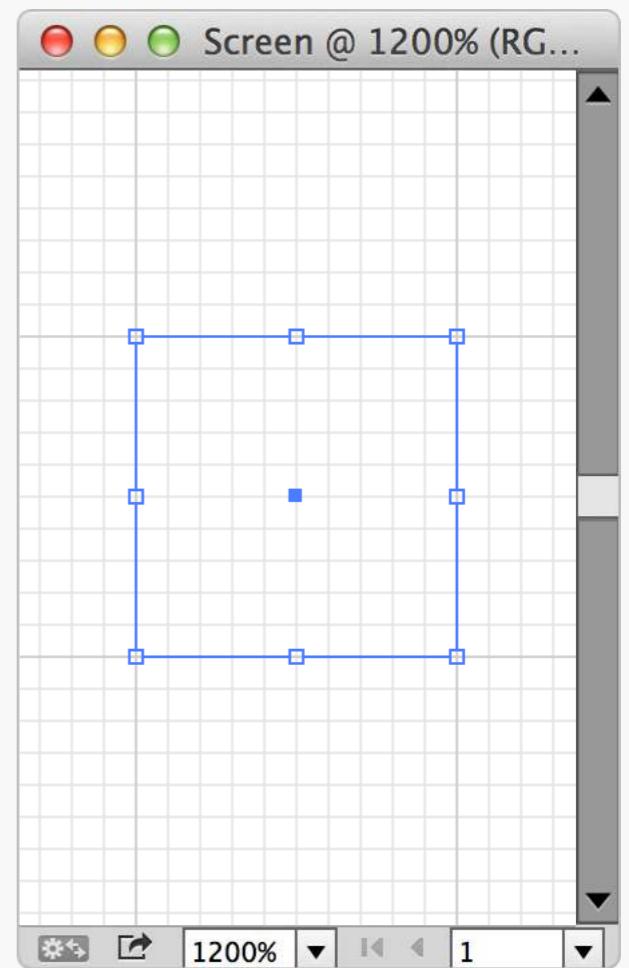
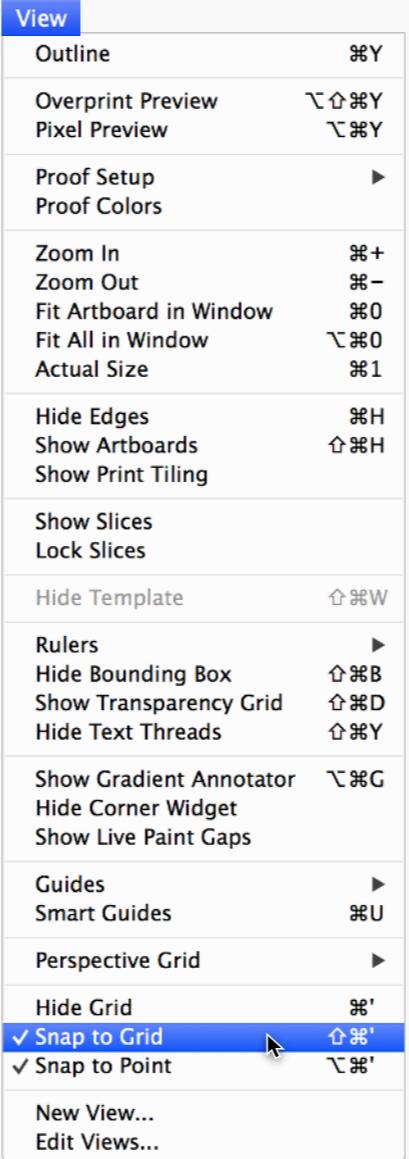


# Grids

As with Photoshop, you might find it useful to set up a grid based on 10px gridlines with 10 subdivisions. These settings can be found in *Preferences > Guides & Grid*.

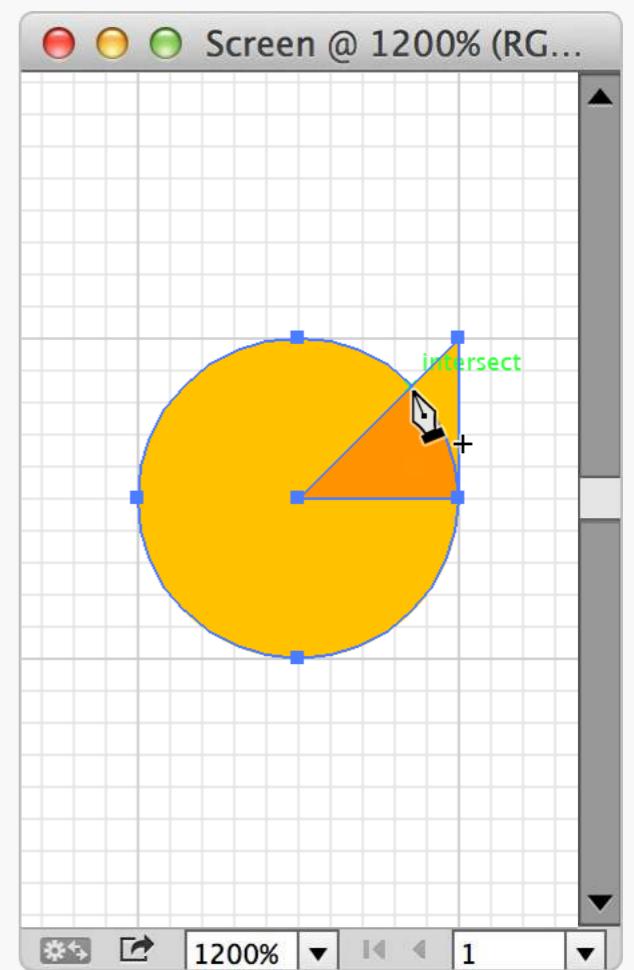
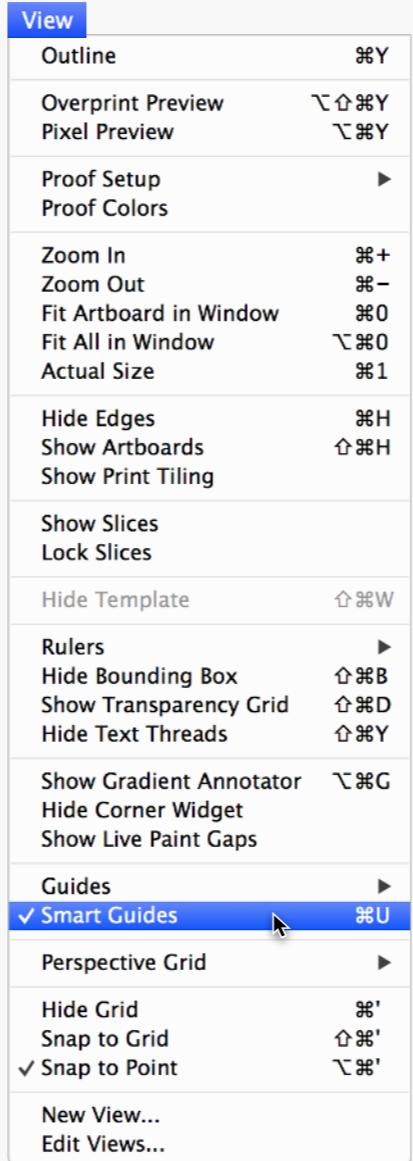
# Snap to Grid

Yup, you guessed it, switch *Snap to Grid* on here too! Just like Photoshop's version, it's located in the *View* menu.



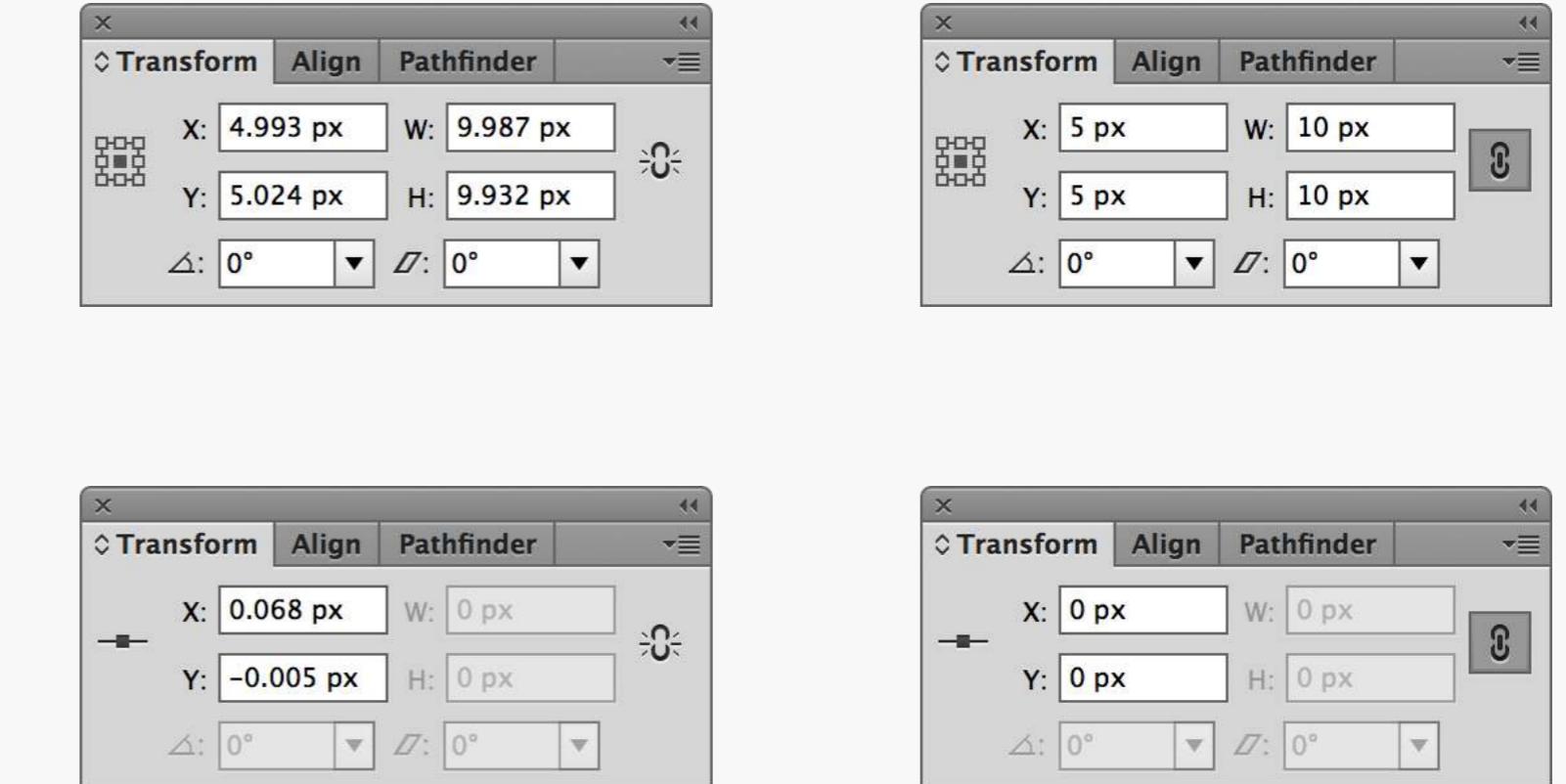
# Smart Guides

Sometimes you need to rebel and break out of the pixel grid. On these occasions, Smart Guides provide a handy alternative form of snapping. In the example above an extra anchor point is needed at the 45° position on the circle. By placing a right-angled triangle



underneath it as shown, switching on Smart Guides, and then selecting the circle — the Pen tool can snap to the precise location where the two shapes intersect and add an anchor point there.

# Precision



✗ Naughty

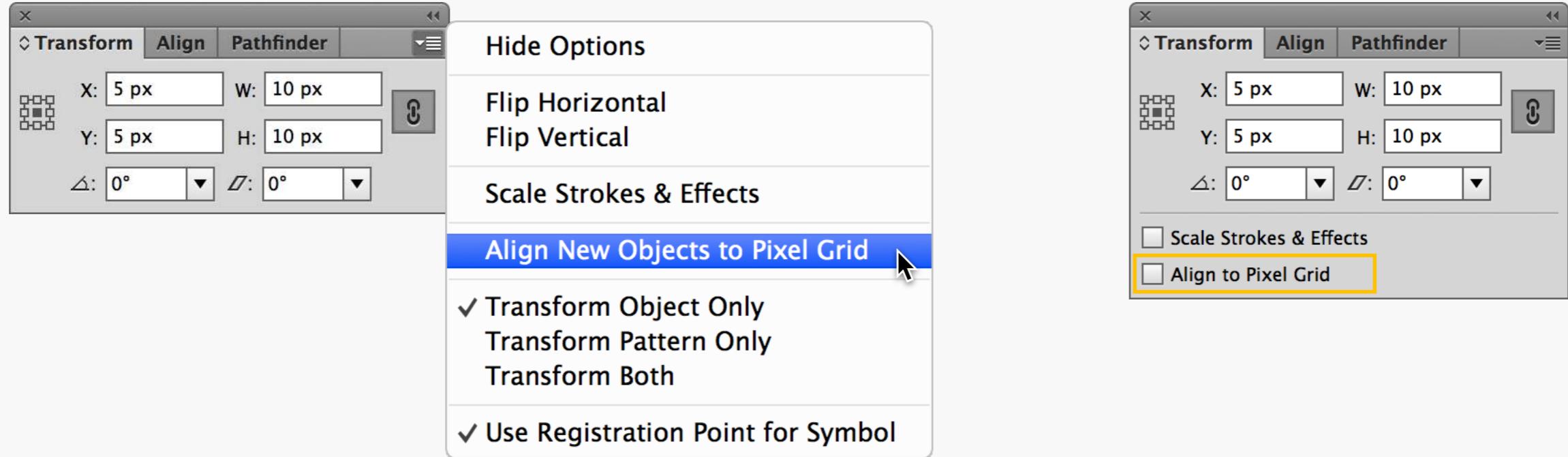
The Transform window is a pixel precisionist's best friend. With it you can check if a whole shape (top row), or a single point (bottom row) are perfectly sized and/or positioned. Also, by using the link option for the *W* and *H* boxes, any transformation you make to one

dimension will adjust the other by the same factor, keeping the object in proportion.

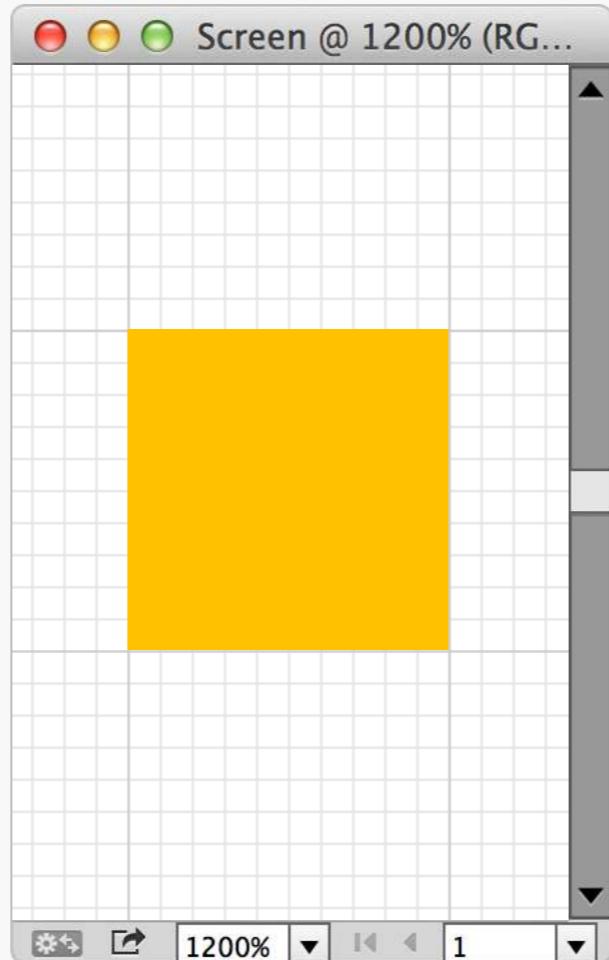
✓ Nice

# Align to Pixel Grid

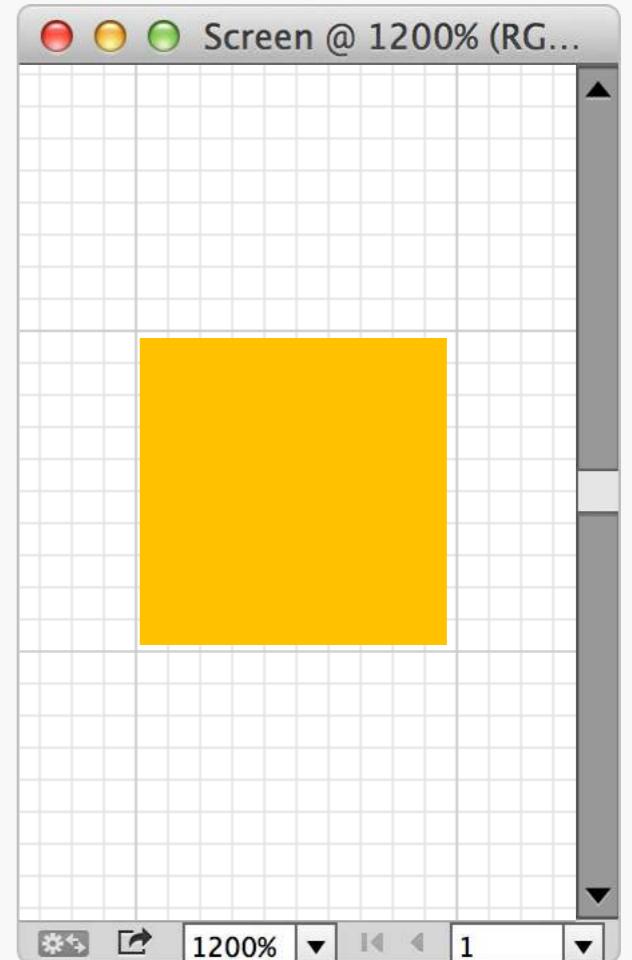
The new super-villain of Illustrator! Make sure *Align New Objects to Pixel Grid* is switched off in the Transform panel menu, and for any existing shapes *Align to Pixel Grid* is unchecked when they're selected (choose *Show Options* in the panel menu to display



these settings). When active this feature aligns objects to the underlying pixel grid, which sounds perfect until you realise it can unexpectedly start shifting objects around when strokes are added.



Pixel Preview On



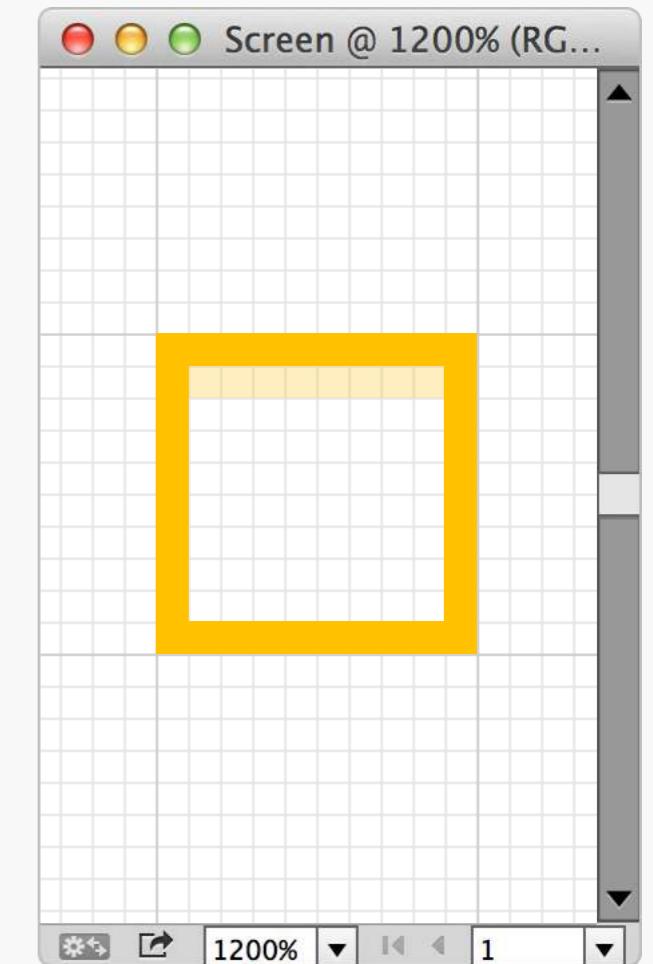
Pixel Preview Off

## Pixel Preview

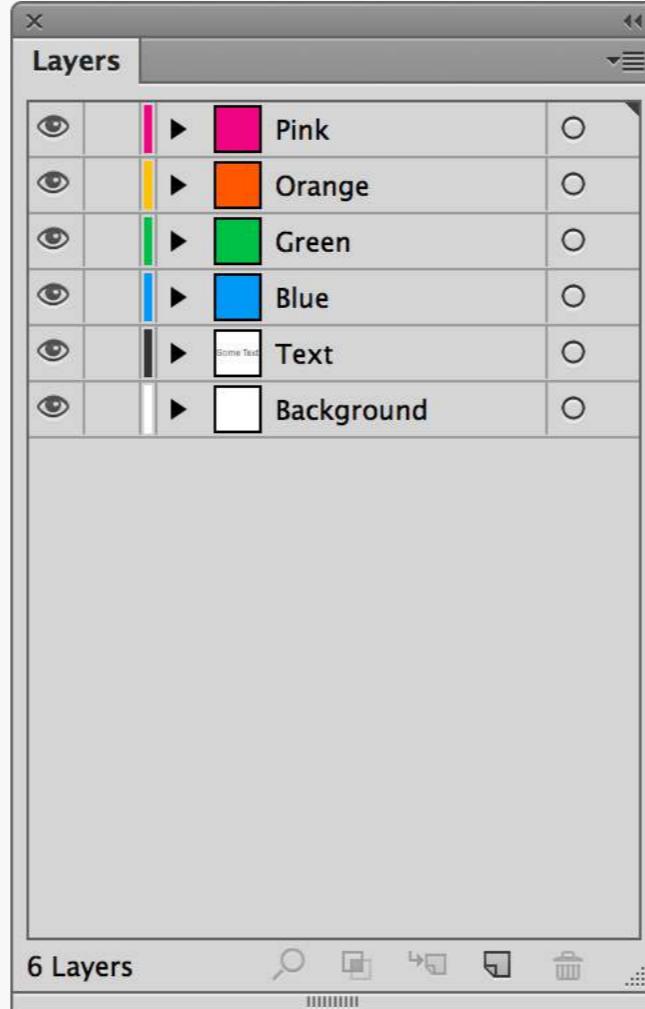
This is another feature to be wary of. When *View > Pixel Preview* is active, shapes which may not be pixel precise can be displayed as if they are.

## Preview Blurring

Nothing to worry about too much here, but sometimes Illustrator will render a shape with blurred edges even though the dimensions are on pixel in the Transform window. This seems to be a bug with the program. Thankfully the



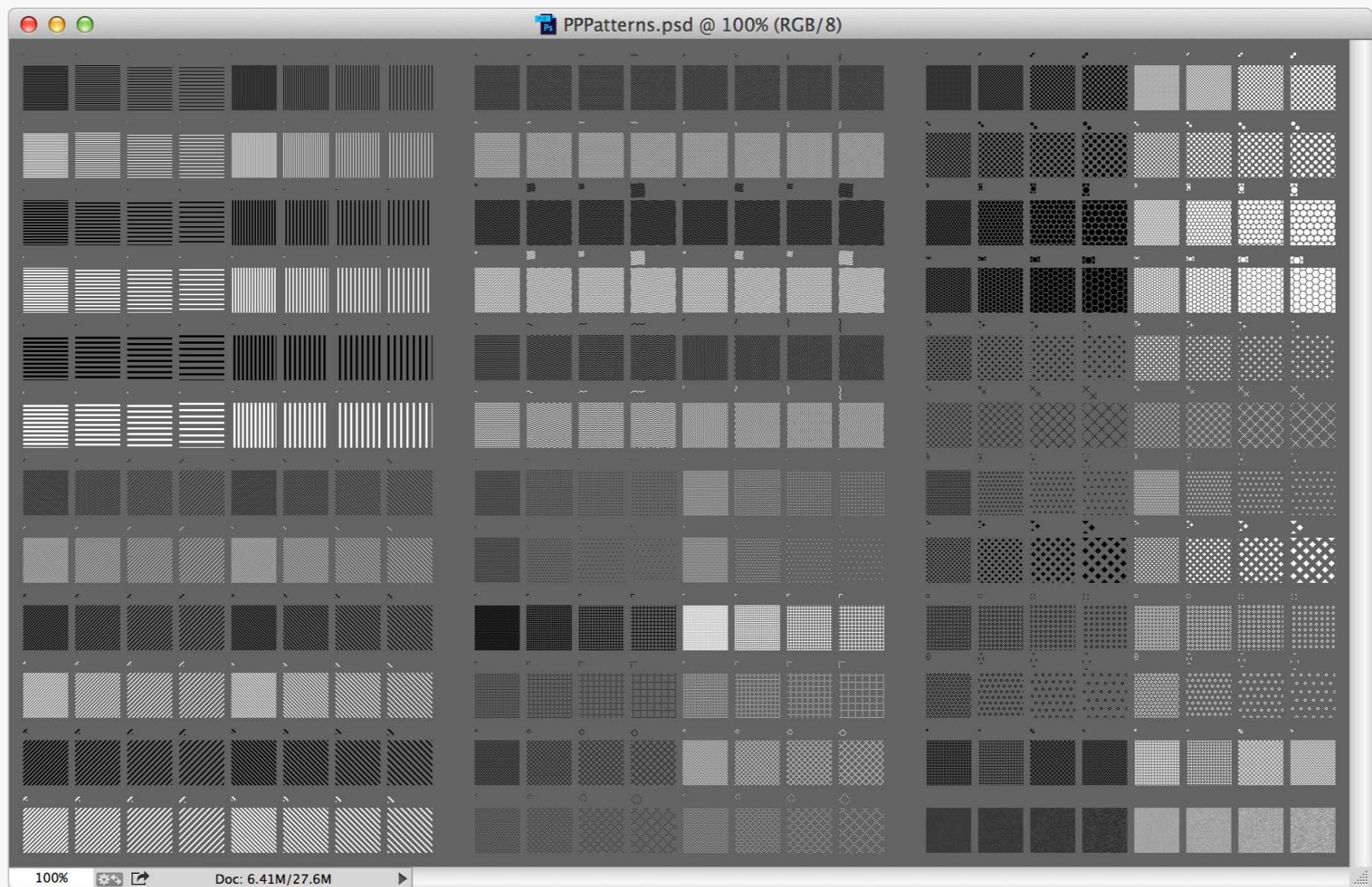
blurring doesn't appear when the shape is imported into Photoshop.



# Organisation

It's not really worth naming every layer in Illustrator if you're just using it to draw shapes, but at least try to organise everything into groups rather than spreading it all out over an area the size of a football pitch!

# APPENDIX



# PPPatterns

The PPP Extras include a simple pattern library for you to play with, available as Photoshop presets (*Patterns/PPPATTERN.pat*) or pre-applied Effects (*Patterns/PPPATTERN.psd*).

WIMM