



The Android Developer Conference

Mastering Material Design

Guilherme Schmitt

 [@guischmitt](https://twitter.com/guischmitt)

 guilherme@intrepid.io

I N T R E P I D



 [@Intpd](https://twitter.com/Intpd)

 <http://intrepid.io/>

Before we Begin...

Please check if you have the latest version of the presentation.

version
1.5

If that's not your version, please download it again at

<http://bit.ly/material-slides>

Hi, I'm Guilherme!



UX Designer from
Porto Alegre, Brazil

Visual Design
Universidade Federal do Rio Grande do Sul

New Media Design
Rochester Institute of Technology



I work at Intrepid

INTREPID 

Mobile design and development firm
based in **Cambridge, MA** and **New
York, NY**

5 years, 70 people, 100 apps
iOS, Android, Back-end and Rails

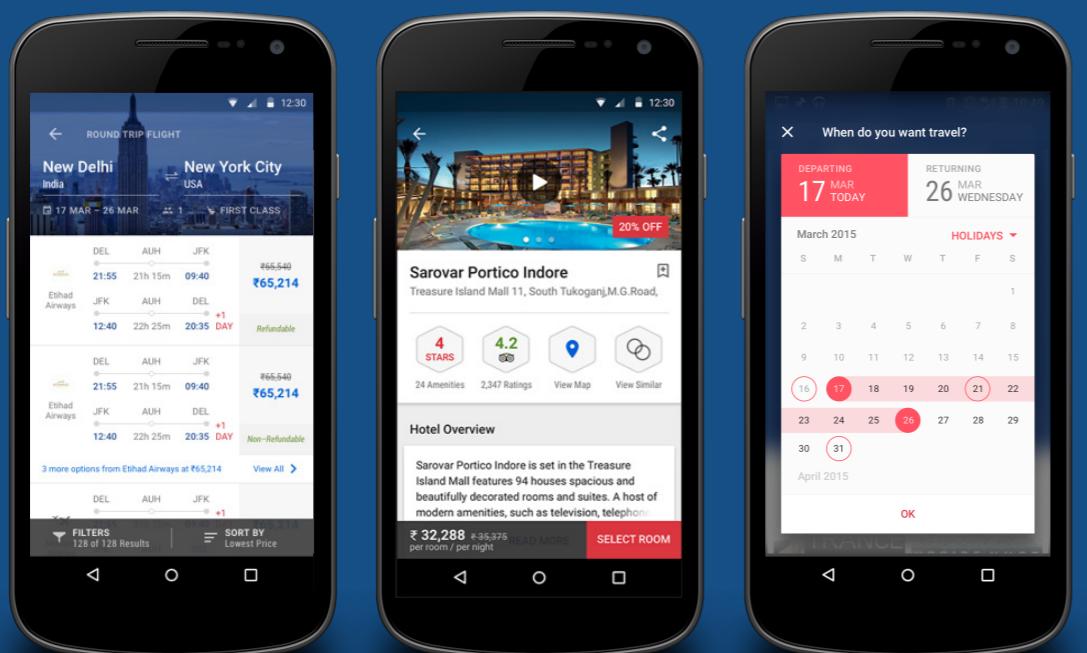
Create the best products at the
intersection of **humanity and technology**



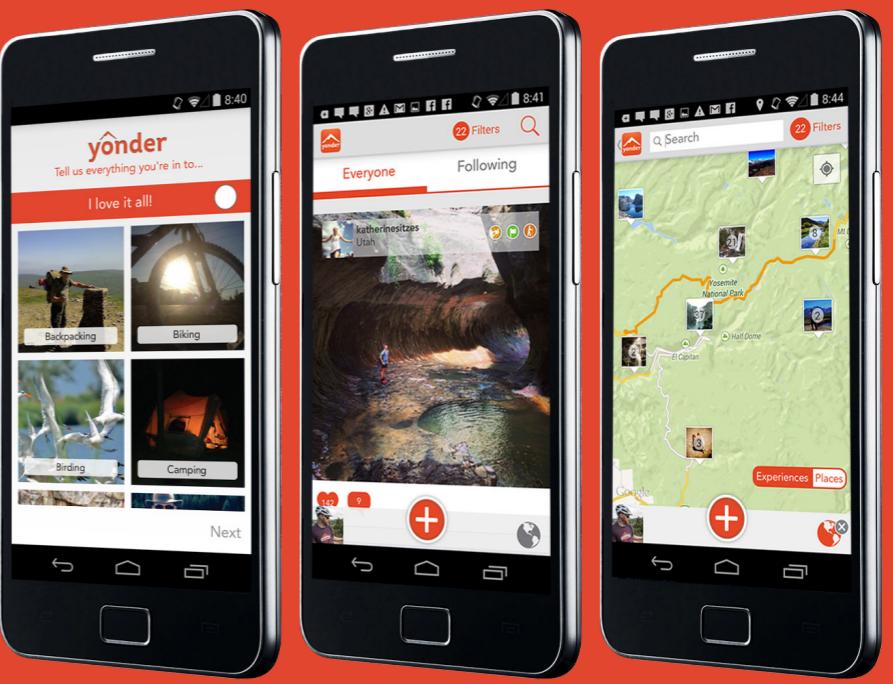
Qup



Make My Trip



Yonder



Chronability



Why Learn About Design?

Better cooperation
between teams

*Crucial for solo
developers*

Why Learn About Design?

Better cooperation
between teams

*Crucial for solo
developers*

Everyone can benefit
from knowing more
about your product

*Designers should also
learn about code too!*

Overview

What are we talking about?



Material Design is a big deal

Design:
the rendering of intent

Material Design is a big deal

Design:
the rendering of intent

Your apps should not only
look good, but behave
in the right fashion



Overview

What are we talking about?

Google Design
Evolution

Material Design
Principles, Structure

Overview

What are we talking about?

Google Design
Evolution

Material Design
Principles, Structure

Dev Tools
Theory to practice

Overview

What are we talking about?

Google Design
Evolution

Material Design
Principles, Structure

Dev Tools
Theory to practice

Case Studies
Material Design Awards

Universal Design
The seamless *future*

Android Design

From Holo to Material

Utilitarian Beginnings



Utilitarian Beginnings

The screenshot shows the original Gmail interface. At the top left is the "Gmail by Google" logo with "BETA" below it. To the right are links for "Contacts", "Settings", "Help", and "Sign out". Below the logo is a search bar with "Search Mail" and "Search the Web" buttons, and links for "Show search options" and "Create a filter". A "Compose Mail" button is on the far left. The main area has a header with "Back to Inbox", "Archive", "More actions...", and "Newer 18 of 18". On the left, a sidebar lists "Inbox", "Starred", "Sent Mail", "All Mail", "Spam", "Trash", and a "Labels" section with "test" and "Edit labels". The main content area displays a message from the "Gmail Team" with the subject "<mailto:gmail-noreply@google.com> to me". The message body starts with "First off, welcome. And thanks for agreeing to help us test Gmail. By now you probably know the key ways in which Gmail differs from traditional webmail services. Searching instead of filing. A free gigabyte of storage. Messages displayed in context as conversations." It then asks "So what else is new?" and lists several features: "How to use address auto-complete", "Setting up filters for incoming mail", and "Using advanced search options". At the bottom, it notes that text ads or related links are placed alongside messages. To the right of the message are three links: "Open in new window", "Print conversation", and "Expand all". Below these are "Sponsored Links" for "Fresh News About Search" (www.traffick.com) and "Search for fresh sites." (enginessearch.com), along with a link to "About these links".

Gmail is different. Here's what you need to know. [Inbox](#)

Apply label... [More options](#) Apr 8

★ Gmail Team <gmail-noreply@google.com> to me

First off, welcome. And thanks for agreeing to help us test Gmail. By now you probably know the key ways in which Gmail differs from traditional webmail services. Searching instead of filing. A free gigabyte of storage. Messages displayed in context as conversations.

So what else is new?

Gmail has many other special features that will become apparent as you use your account. You'll find answers to most of your questions in our searchable [help](#) section, which includes a [Getting Started guide](#). You'll find information there on such topics as:

- How to use address auto-complete
- Setting up filters for incoming mail
- Using advanced search options

You may also have noticed some text ads or related links to the right of this message. They're placed there in the same way that ads are placed alongside

[Open in new window](#)

[Print conversation](#)

[Expand all](#)

Sponsored Links

[Fresh News About Search](#)
What's the real scoop on the search industry? Fresh insights since 1999
www.traffick.com

[Search for fresh sites.](#)
A Pay Per Click for new web sites! No ads. Find Brand-new listings.
enginessearch.com

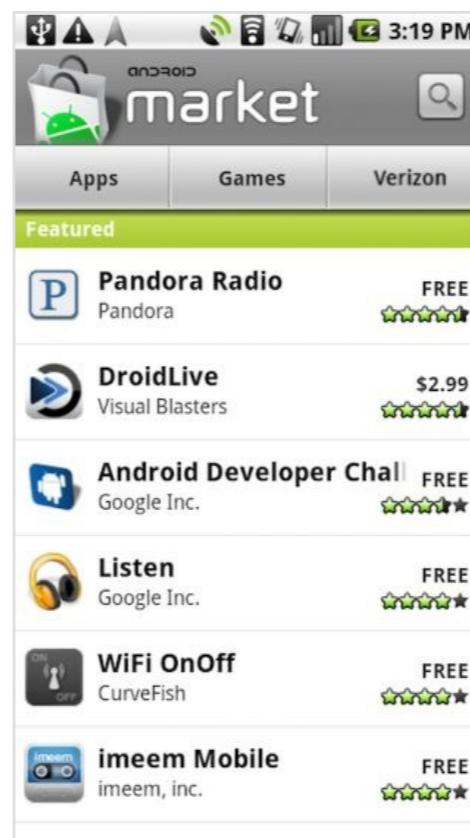
[About these links](#)

Android Design

Utilitarian Beginnings



Android 1.0



Android 2.0

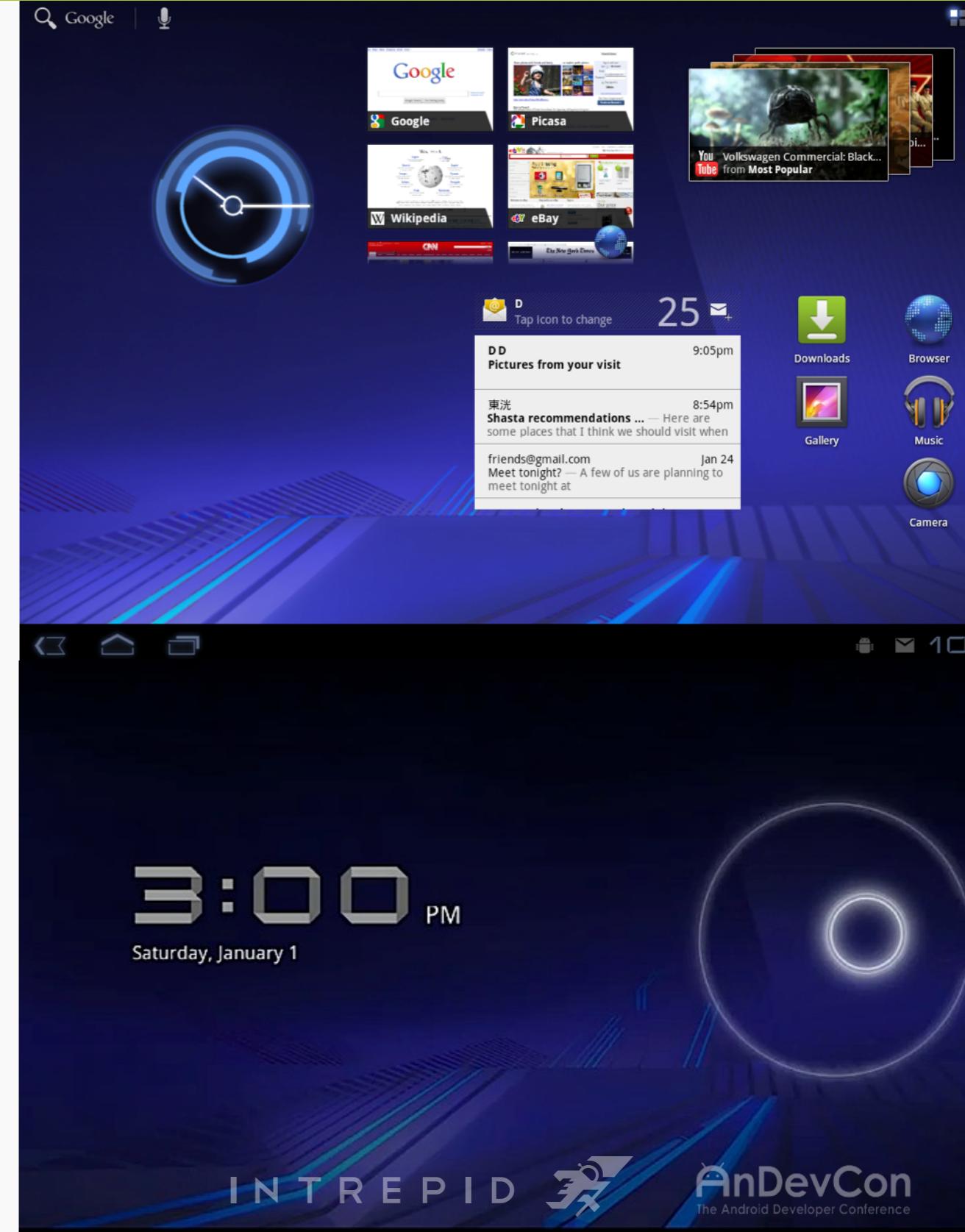


Android Evolution

Android 3.0
Honeycomb

First attempt at
theme consistency

Holographic, *tron-*-
like theme



Android Design

Android Evolution

Meanwhile on the web...

The Google+ Project 2011

The screenshot shows the Google+ Stream interface. On the left, there's a sidebar with navigation links like Stream, Friends, Family, Acquaintances, Following, Blogging, More, Incoming, Notifications, Sparks, NC A&T, Black culture, Theology, and Chat. The main area displays a post from 'Mashable News' at 6:38 PM. The post asks, "What should we ask Obama during his Twitter town hall on Wednesday?" It includes a link to "What Should Mashable Ask Obama During His Twitter Town Hall? [POLL]" and a small image of Barack Obama. Below the post, there are options to Comment and Share. Further down, there are 2 shares from Asim Perwaiz and Dean Pitter, and 25 older comments from various users. On the right side of the stream, there's a section titled "In your circles (20)" showing profile pictures of friends and a "View and edit" link. Below that is a "Questions" section with three items, each with an "Add to circles" button. At the bottom, there's a "Hangouts" section with a "Start a hangout" button and a "Go mobile" section with a "Get Google+ for your" link.



Android Design Android Evolution

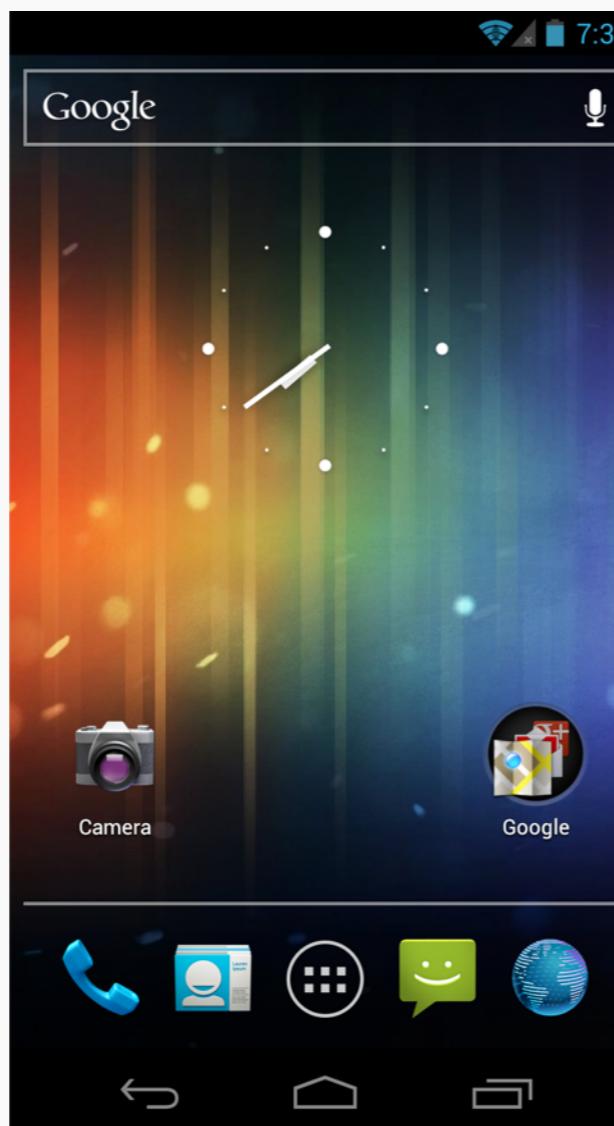
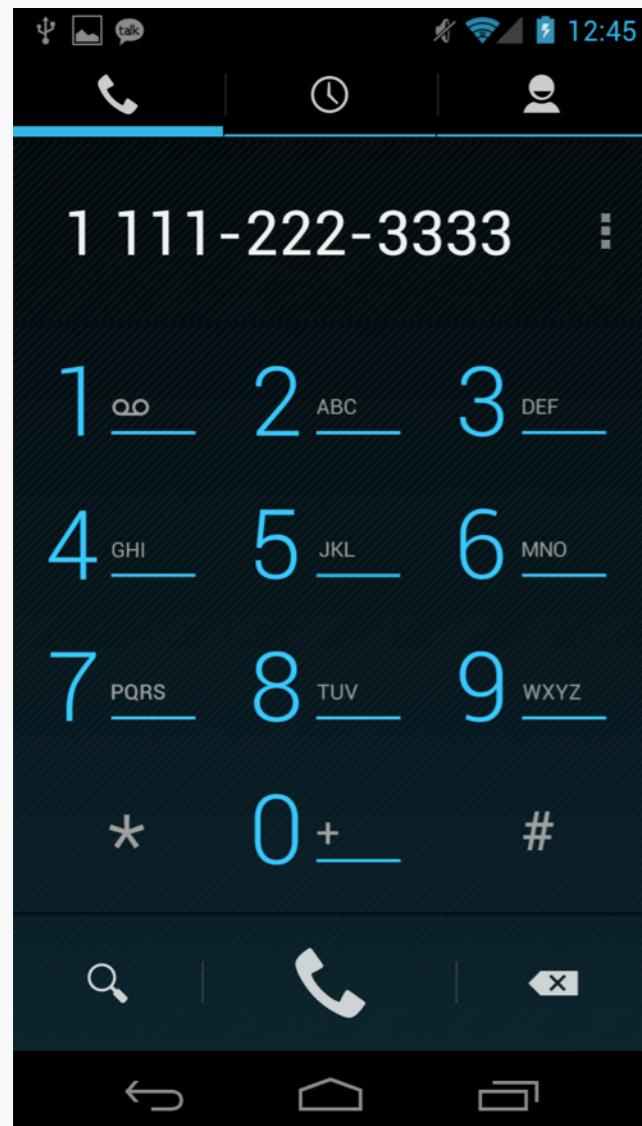
Project Kennedy

The screenshot shows the Gmail inbox interface. At the top, there are links for 'Gmail', 'Calendar', 'Documents', 'Photos', 'Reader', 'Web', and 'more...'. Below that is the 'SEARCH MAIL' and 'SEARCH THE WEB' bar. The main area displays 15 emails from the 'Hiking Fan' folder. The emails are listed with their senders, subject lines, and dates. The interface includes standard Gmail controls like 'Archive', 'Report spam', 'Delete', 'Move to', 'Labels', and 'More'.

The screenshot shows the Google search results for the query 'Android'. The top result is 'New Android™ Phones | android.t-mobile.com'. Other results include 'Android' (www.android.com), 'Home - Android Market' (https://market.android.com/), 'Android Developers' (developer.android.com/), and 'Android Central | Android Forums, News, Reviews, Help and...' (www.androidcentral.com). The right sidebar shows 'People and Pages on Google+' related to Android, including profiles for 'Android' (in 365,238 circles), 'Andy Rubin' (in 35,822 circles), and 'Android Developers' (in 29,172 circles).

<http://www.theverge.com/2013/1/24/3904134/google-redesign-how-larry-page-engineered-beautiful-revolution>

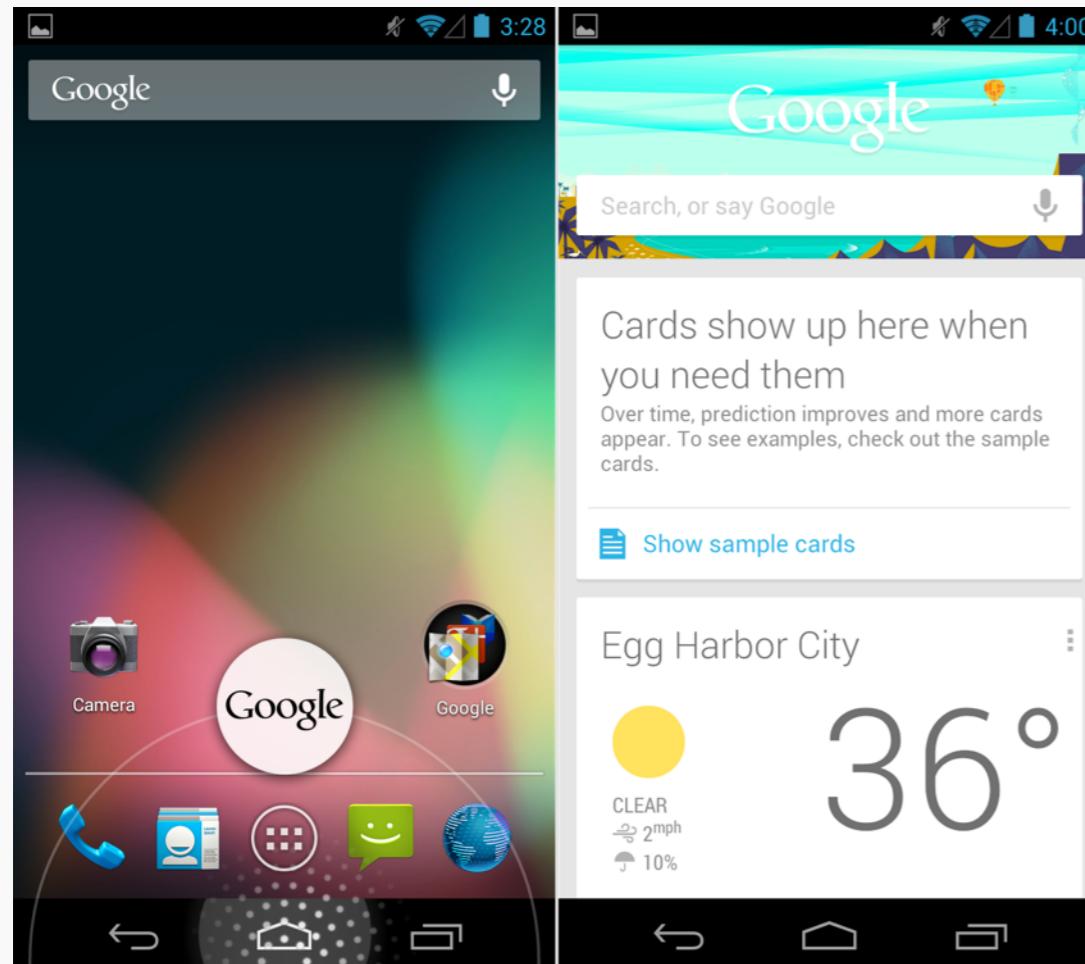
Android Evolution



Android 4.0
Ice Cream Sandwich
Holo is born

Android Design

Android Evolution



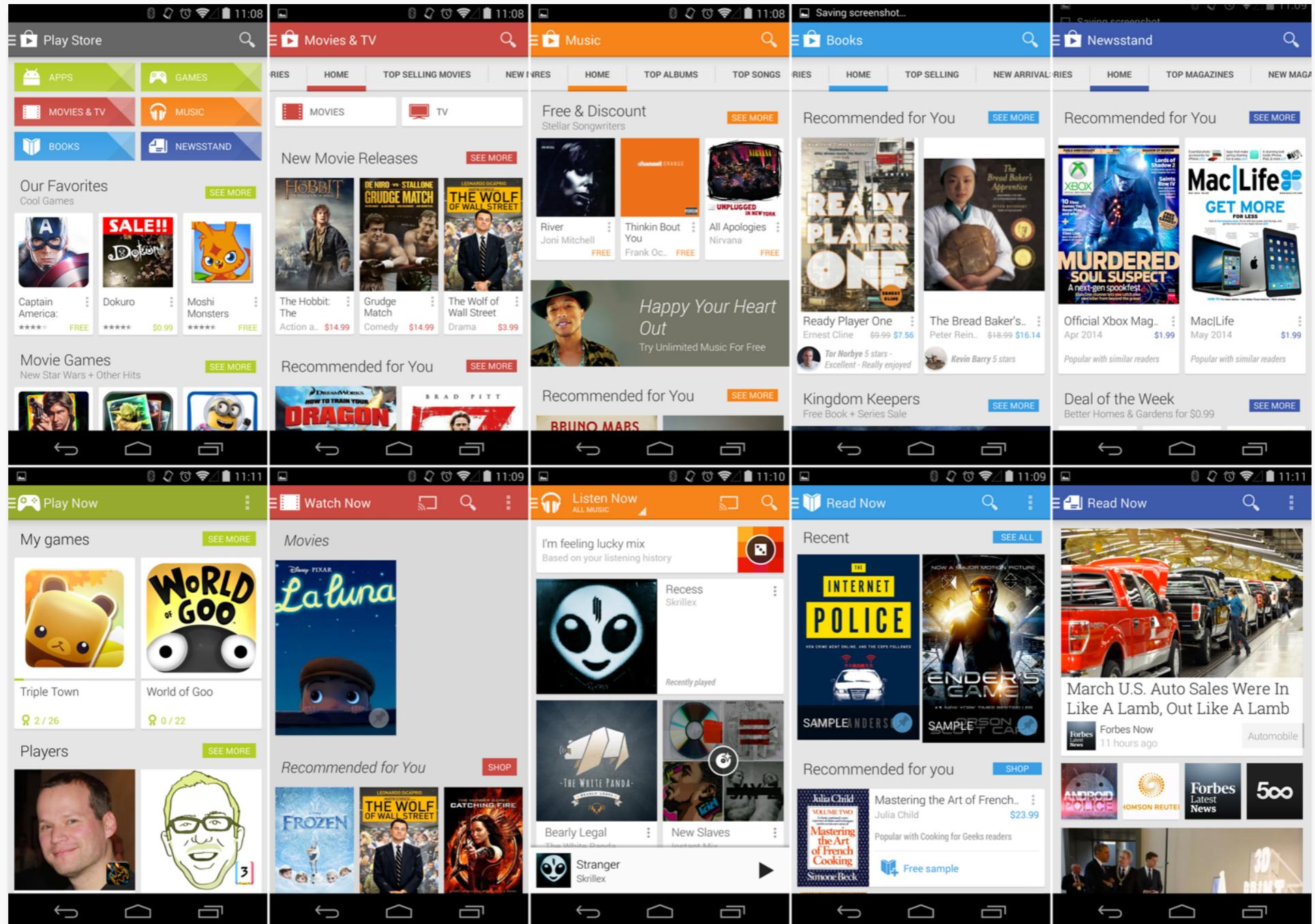
Android 4.1 *Jelly Bean*



Android 4.4 *Kit Kat*

Android Design

Android Evolution



Android Design

Android Evolution

android

wear
auto
tv

Android Evolution

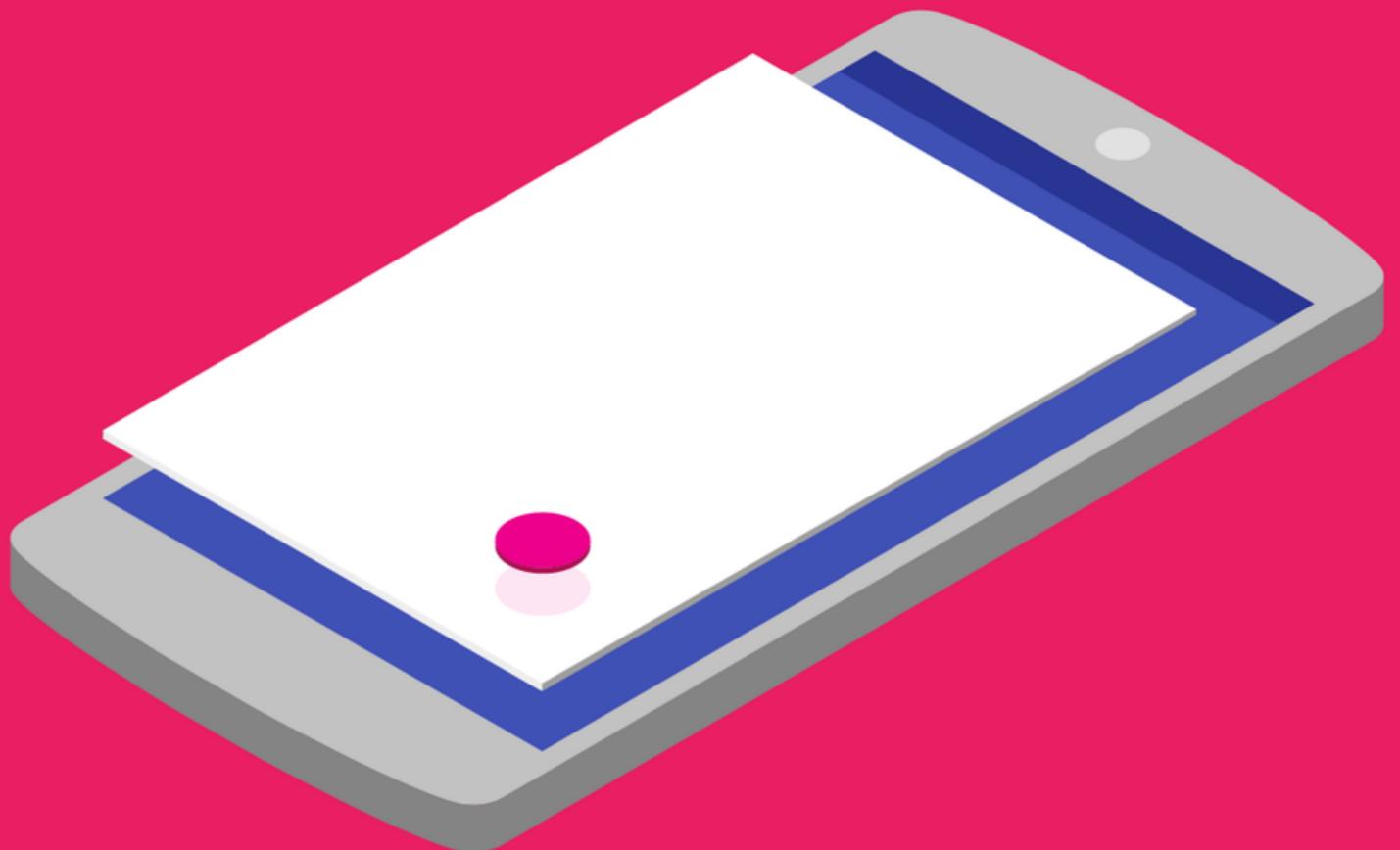
Refreshed focus on
design by Google

Opportunity to unify
Google Design

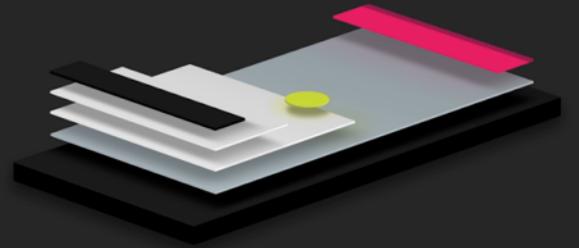
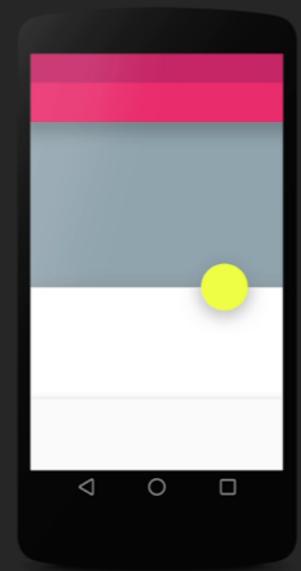


Going Material

Google Design comes
together at last



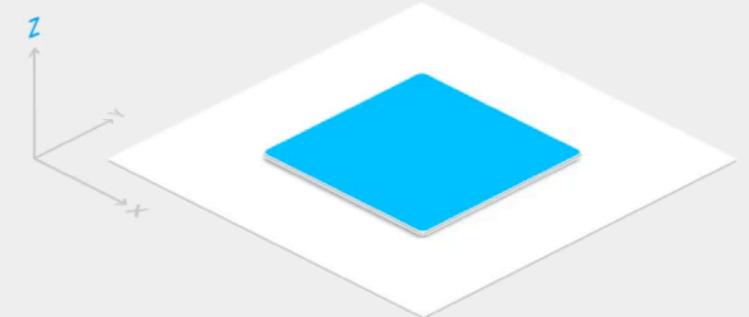
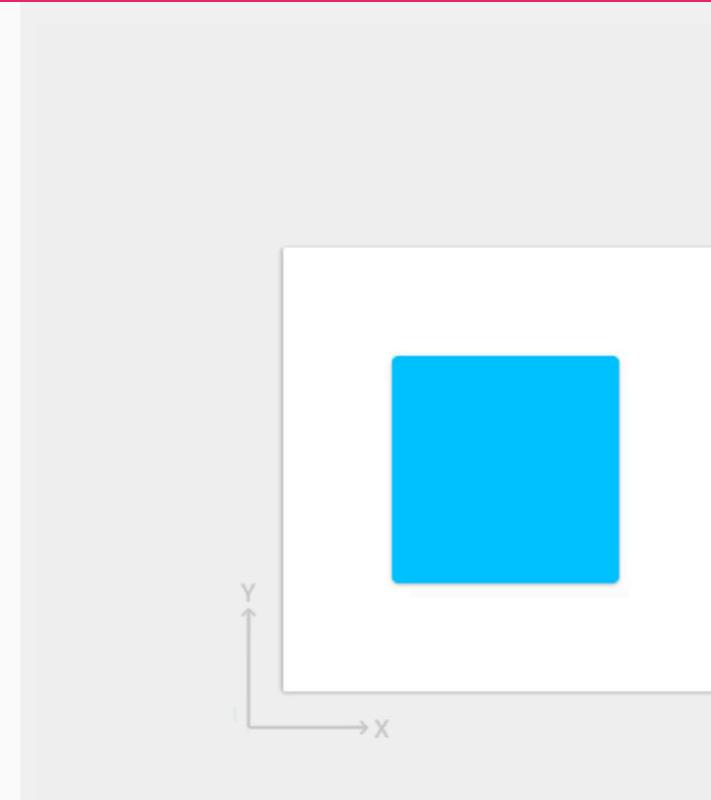
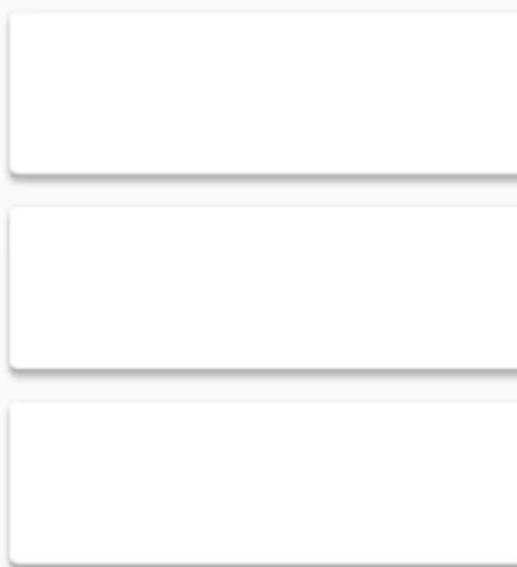
What if pixels
didn't just have color,
but also depth?



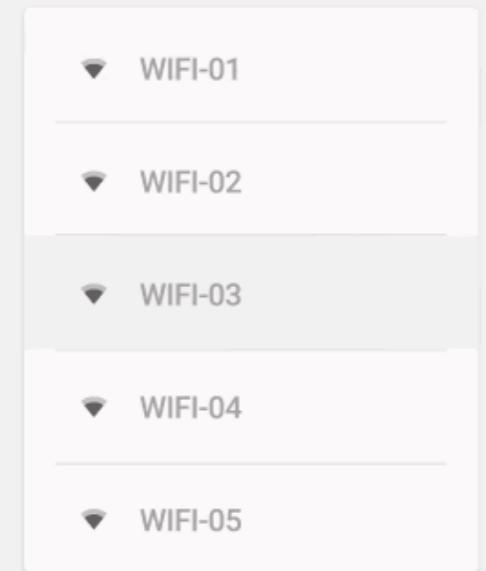
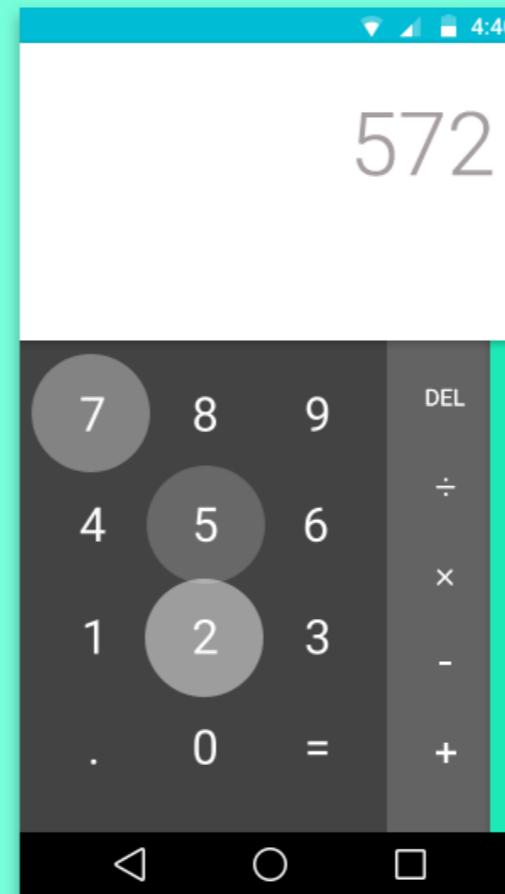


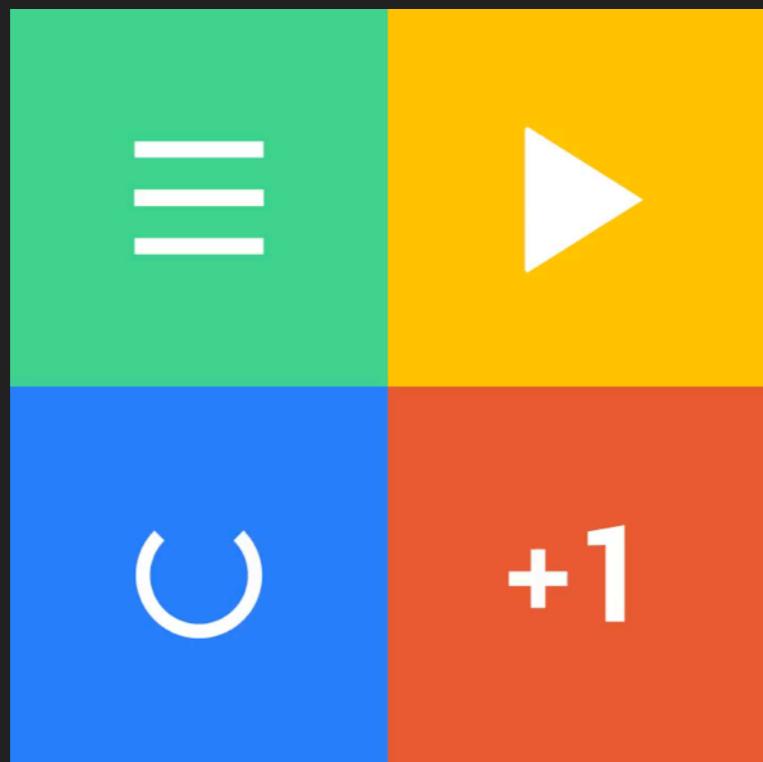
Inspiration from paper and ink, but unlike real paper this digital material can expand, reform and reshape intelligently

Shadows and the laws
of the real world are used to convey
the relation between elements
and their interactivity

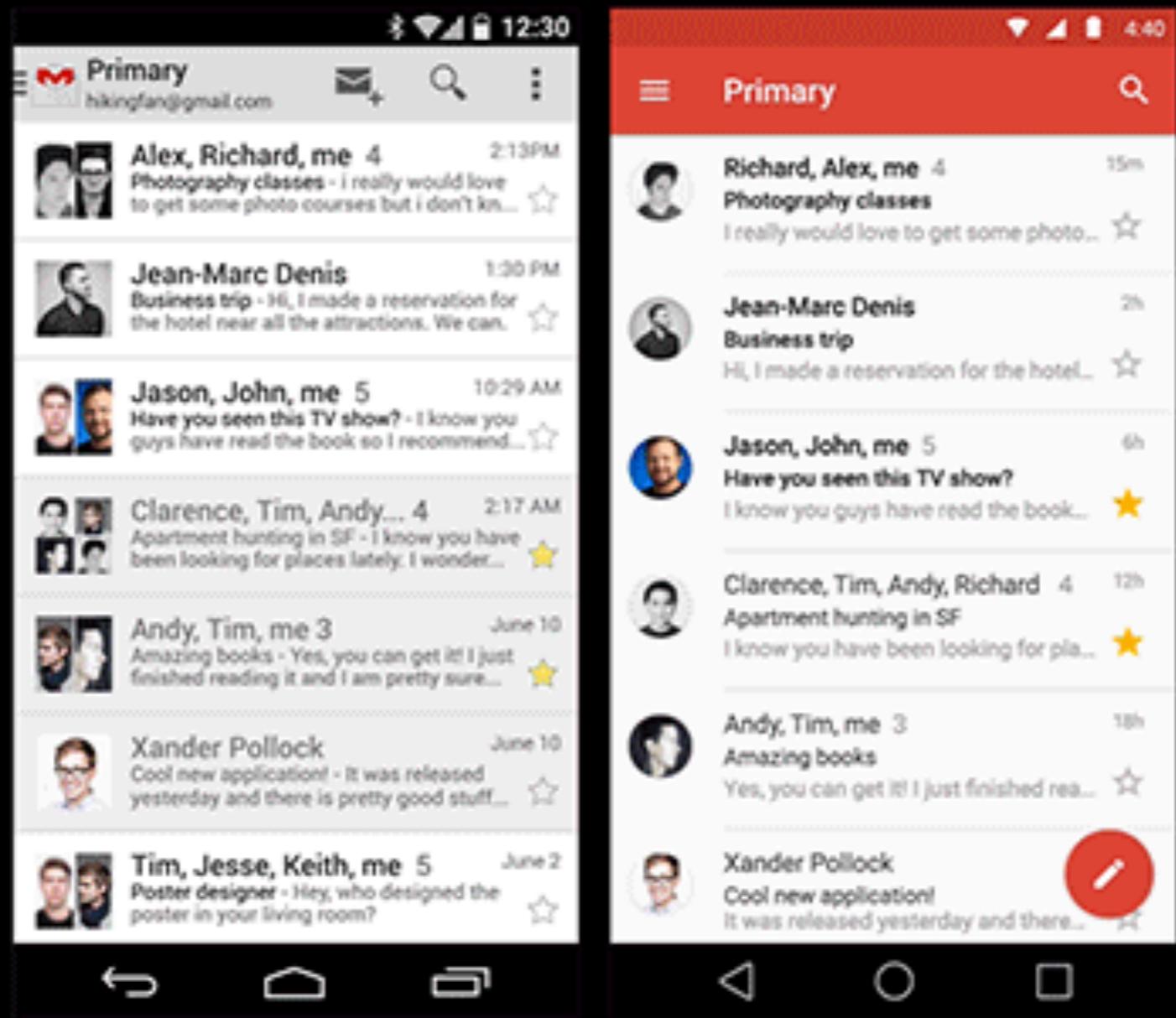


Users feel in full control of the UI, like they could paint the screen with their finger

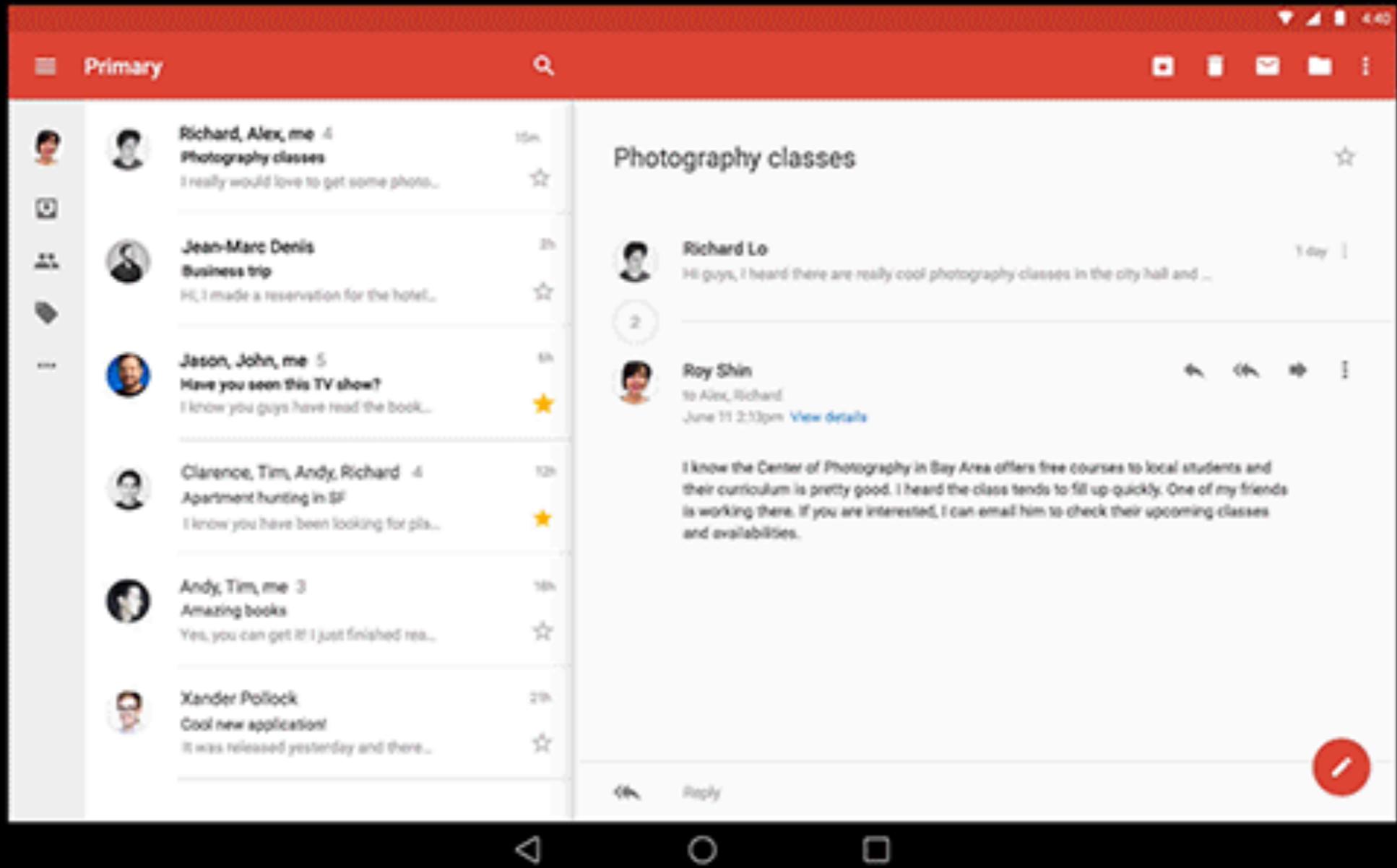




Add delight
to otherwise
mundane tasks

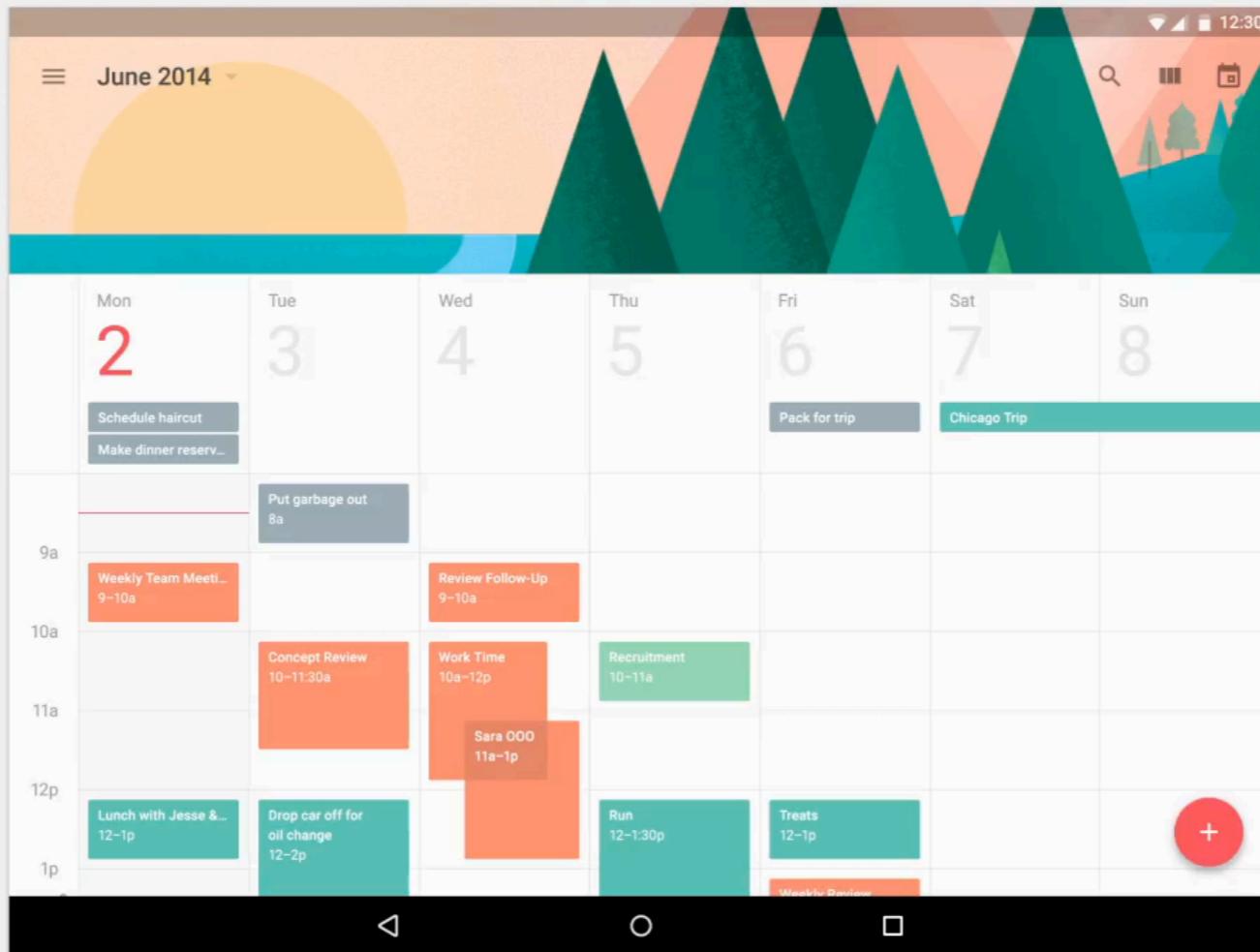


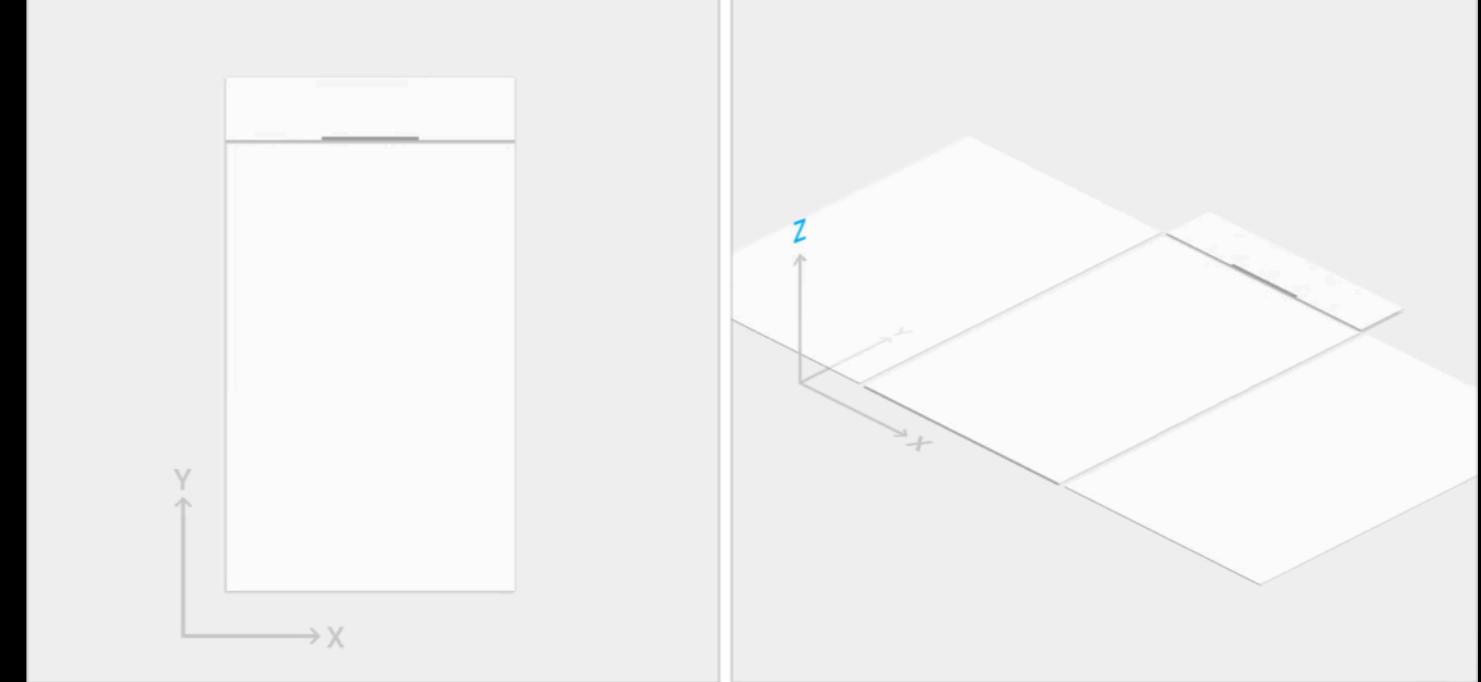
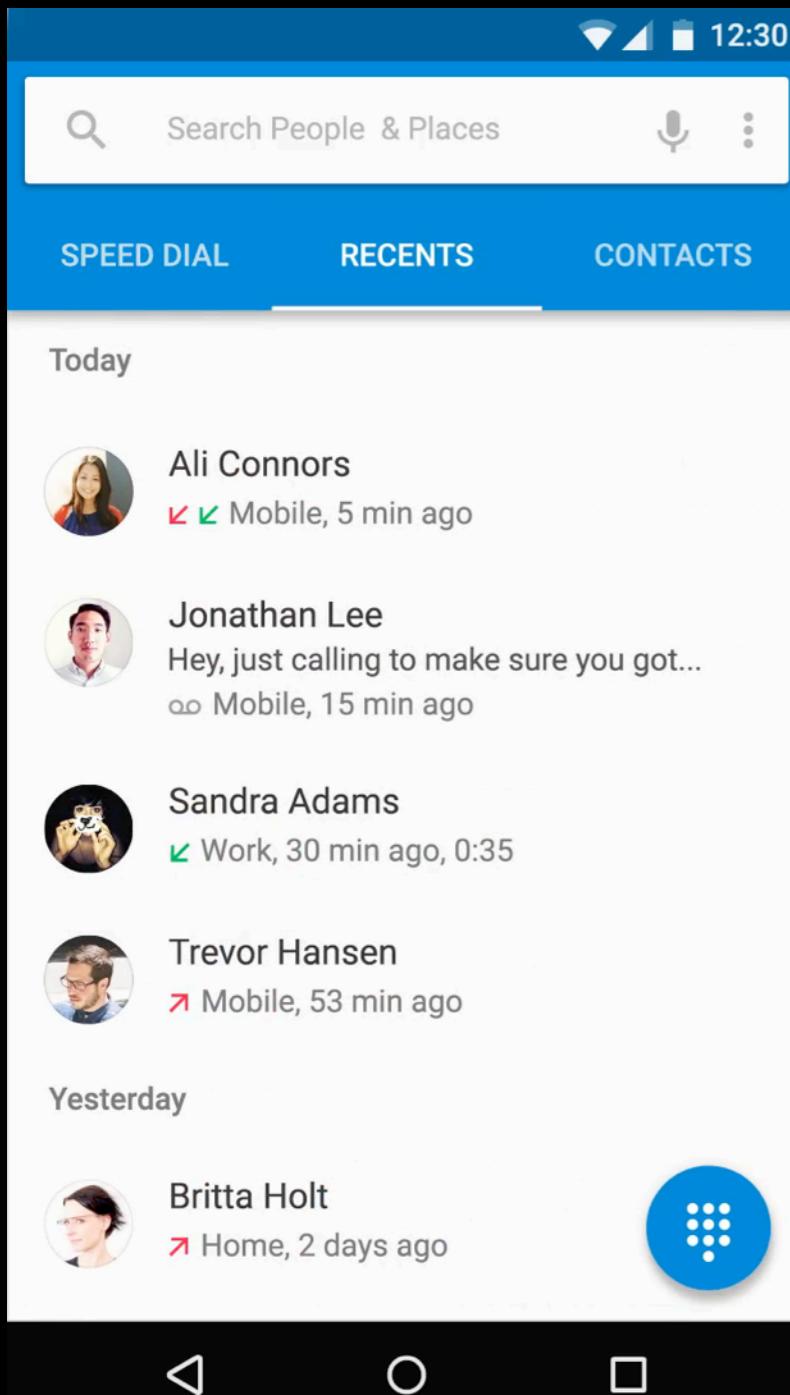
Comfort over clutter



The material structure facilitates the transition to other layouts

In the real world,
nothing teleports from
one place to another.





Helps communicate what's happening in the UI, providing visual continuity across app contexts and states.

Motion isn't employed simply for motion's sake.

Structure

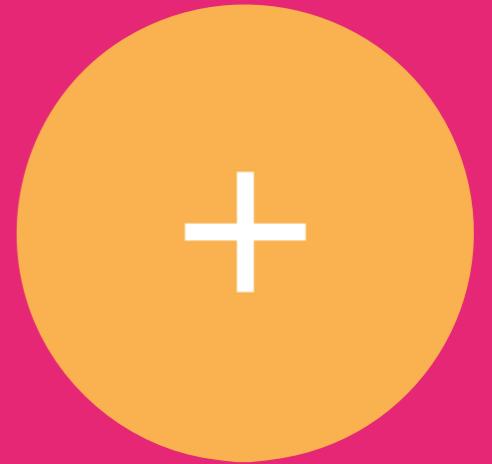
What is Material
made of?

Floating Action Button

FAB

The app main feature, in
an easy to access location

One of the flagship elements
of Material Design



Structure

Floating Action Button



Structure

Floating Action Button

Keep in mind...

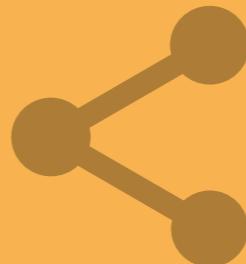
Not every app needs a FAB



Structure

Floating Action Button

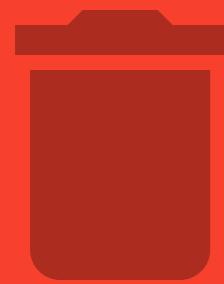
Google recommends
using positive actions



Structure

Floating Action Button

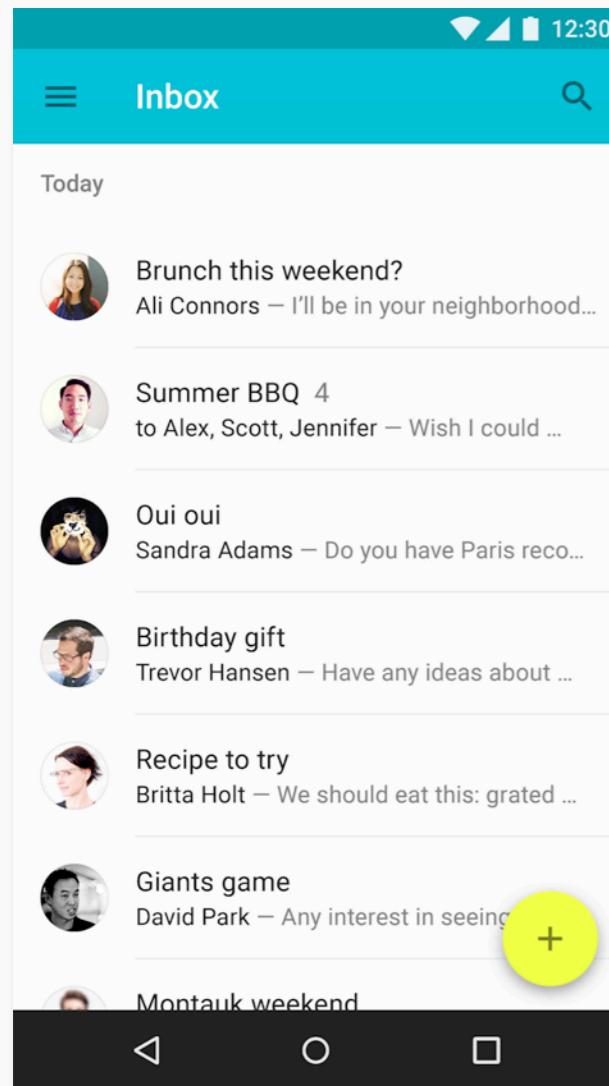
Don't use it for
minor, destructive
or app bar actions



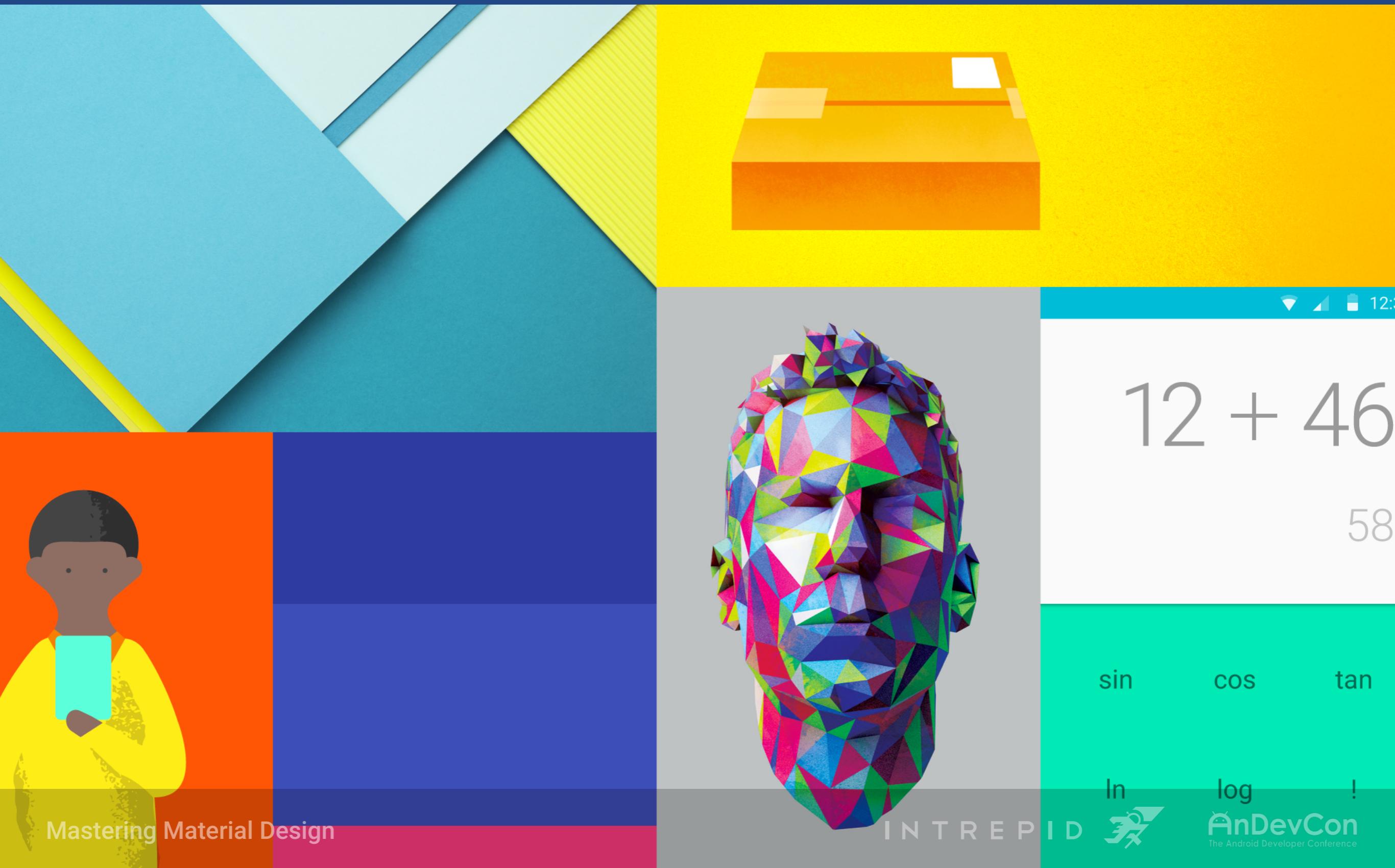
Structure

Floating Action Button

Fab can also transform into additional, related actions



Structure Material Colors



Structure

Material Colors

Red	Pink	Purple	Deep Purple	Indigo	Blue	Light Blue	Cyan	Teal	Blue Grey								
500	#F44336	500	#E91E63	500	#9C27B0	500	#673AB7	500	#3F51B5	500	#2196F3	500	#00BCD4	500	#009688	500	#607D8B
50	#FFEBEE	50	#FCE4EC	50	#F2E5F5	50	#EDE7F6	50	#E0EAF6	50	#E3F2FD	50	#E1F5FE	50	#E0F7FA	50	#E0F2F1
100	#FFCDD0	100	#F8BBD0	100	#E1BEE7	100	#D1C4E9	100	#C5CAE9	100	#B8BDFB	100	#B3E5FC	100	#B2EBF2	100	#CFD8DC
200	#EF9A9A	200	#F48FB1	200	#CE93D8	200	#B390D8	200	#9F88D0	200	#90CAF9	200	#81D4FA	200	#80DEEA	200	#80CBC4
300	#E57773	300	#F0E292	300	#BA68C8	300	#9575CD	300	#7986CB	300	#64B5F6	300	#4FC3F7	300	#4DDEE1	300	#4DB6AC
400	#EF5350	400	#EC407A	400	#AB47BC	400	#7E57C2	400	#5C48C0	400	#42A5F5	400	#2194F3	400	#26C5DA	400	#25A89A
500	#F44336	500	#E91E63	500	#9C27B0	500	#673AB7	500	#3F51B5	500	#2194F3	500	#0399E5	500	#00BCD4	500	#009688
600	#E59935	600	#D81B60	600	#8E24AA	600	#5E35B1	600	#3949AB	600	#1E88E5	600	#0399E5	600	#00BCD4	600	#009688
700	#D3292F	700	#C21B5B	700	#781FA2	700	#5120A8	700	#3039F9	700	#1976D2	700	#0288D1	700	#0097A7	700	#00796B
800	#C62828	800	#AD1457	800	#6A1B9A	800	#4527A0	800	#283593	800	#1565C0	800	#0277B0	800	#00838F	800	#00695C
900	#E71C1C	900	#880E4F	900	#4A148C	900	#311B92	900	#1A237E	900	#0D47A1	900	#01579B	900	#006064	900	#004D40
A100	#FF8A80	A100	#FF80AB	A100	#EA80FC	A100	#B388FF	A100	#8C9EFF	A100	#E2B1FF	A100	#8008FF	A100	#84FFFF	A100	#A77FEB
A200	#FF5252	A200	#FF4081	A200	#E040FB	A200	#7C40FF	A200	#536DFE	A200	#448AFF	A200	#40C4FF	A200	#18FFFF	A200	#64FFDA
A400	#FF1744	A400	#F50057	A400	#D300F9	A400	#651FFF	A400	#305AFE	A400	#297FFF	A400	#0080FF	A400	#0065FF	A400	#1DE9B6
A700	#D50000	A700	#C51162	A700	#A8A8FF	A700	#6200EA	A700	#304FFE	A700	#2962FF	A700	#0091EA	A700	#00BB04	A700	#00BFAS
Green	Light Green	Lime	Yellow	Amber	Orange	Deep Orange	Brown	Grey	Black	White							
500	#4CAF50	500	#BC054A	500	#CDC039	500	#FFEB3B	500	#FFC107	500	#FF9800	500	#FF5722	500	#79554B	500	#9E9E9E
50	#E8F5E9	50	#F1F8E9	50	#F9FBF7	50	#FFF8E7	50	#FFF8E1	50	#FFF3E0	50	#FFB8E9	50	#EFEBE9	50	#FAFAFA
100	#C8E6C9	100	#CEDC8	100	#F0F4C3	100	#FFF9C4	100	#FFC8B3	100	#FFEB82	100	#FFCCBC	100	#D7CCC8	100	#F5F5F5
200	#A5D6A7	200	#C5E1A5	200	#E6EEC0	200	#FFF9D0	200	#FFEB82	200	#FFCC80	200	#FFB8B1	200	#BCAAA4	200	#EEEEEE
300	#B1C7B4	300	#AE58E1	300	#DCE775	300	#FFF7E6	300	#FFD54F	300	#FFB740	300	#FFB8A5	300	#A1887F	300	#EDEDE0
400	#64BDBA	400	#9CCC65	400	#D4E157	400	#FFEE58	400	#FFCA28	400	#FFA726	400	#FF7043	400	#E0E6E3	400	#BDBDBD
500	#4CAF50	500	#BC054A	500	#CDC039	500	#FFEB3B	500	#FFC107	500	#FF9800	500	#FF5722	500	#79554B	500	#9E9E9E
600	#43A047	600	#7CB442	600	#F0CA33	600	#F0D835	600	#FFB300	600	#FFB8C0	600	#F4511E	600	#E04C41	600	#757575
700	#388E3C	700	#689F38	700	#AFB42B	700	#FBC0D0	700	#FFA0D0	700	#F57C00	700	#E6AA19	700	#D40337	700	#E16161
800	#2E7D32	800	#558B2F	800	#F1E904	800	#F9A825	800	#FFCF00	800	#EF6C00	800	#D84315	800	#E342E	800	#424242
900	#1B1E20	900	#33691E	900	#F27771	900	#F5F7F7	900	#FFA800	900	#E65100	900	#F9360C	900	#E12723	900	#212121
A100	#89F6CA	A100	#CCFF90	A100	#F4FF91	A100	#FFFF80	A100	#FFC57F	A100	#FFD8B0	A100	#FF9E80				
A200	#69F0AE	A200	#B2FF59	A200	#EFFF41	A200	#FFFFF0	A200	#FFD740	A200	#FFAB40	A200	#FF8E40				
A400	#50E676	A400	#876F03	A400	#ECAFF0	A400	#FTEA00	A400	#FFC400	A400	#FF9100	A400	#FF3D00				
A700	#30C851	A700	#F4D017	A700	#E4EEA0	A700	#FFD600	A700	#FFA800	A700	#FFA000	A700	#F0C200				

Structure Material Colors

A suggestion

one main color,
with 3 additional hues

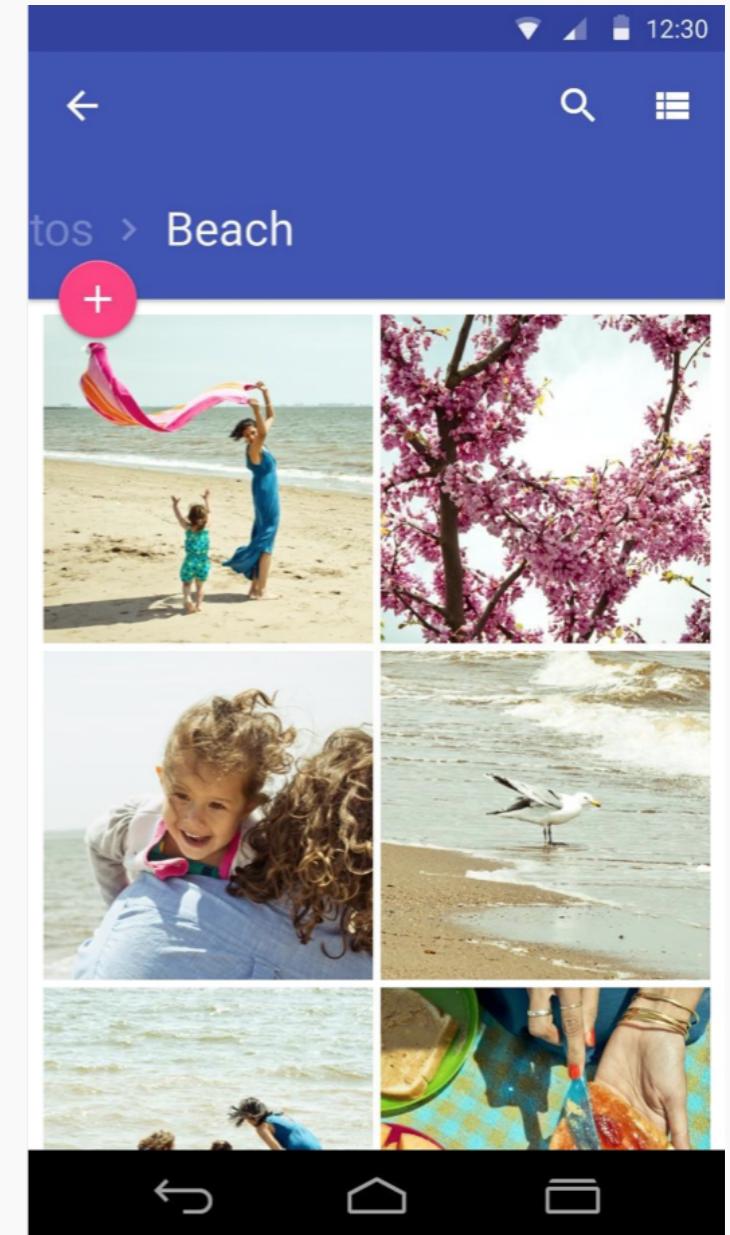
one secondary color,
with 2 additional hues

opacity for text

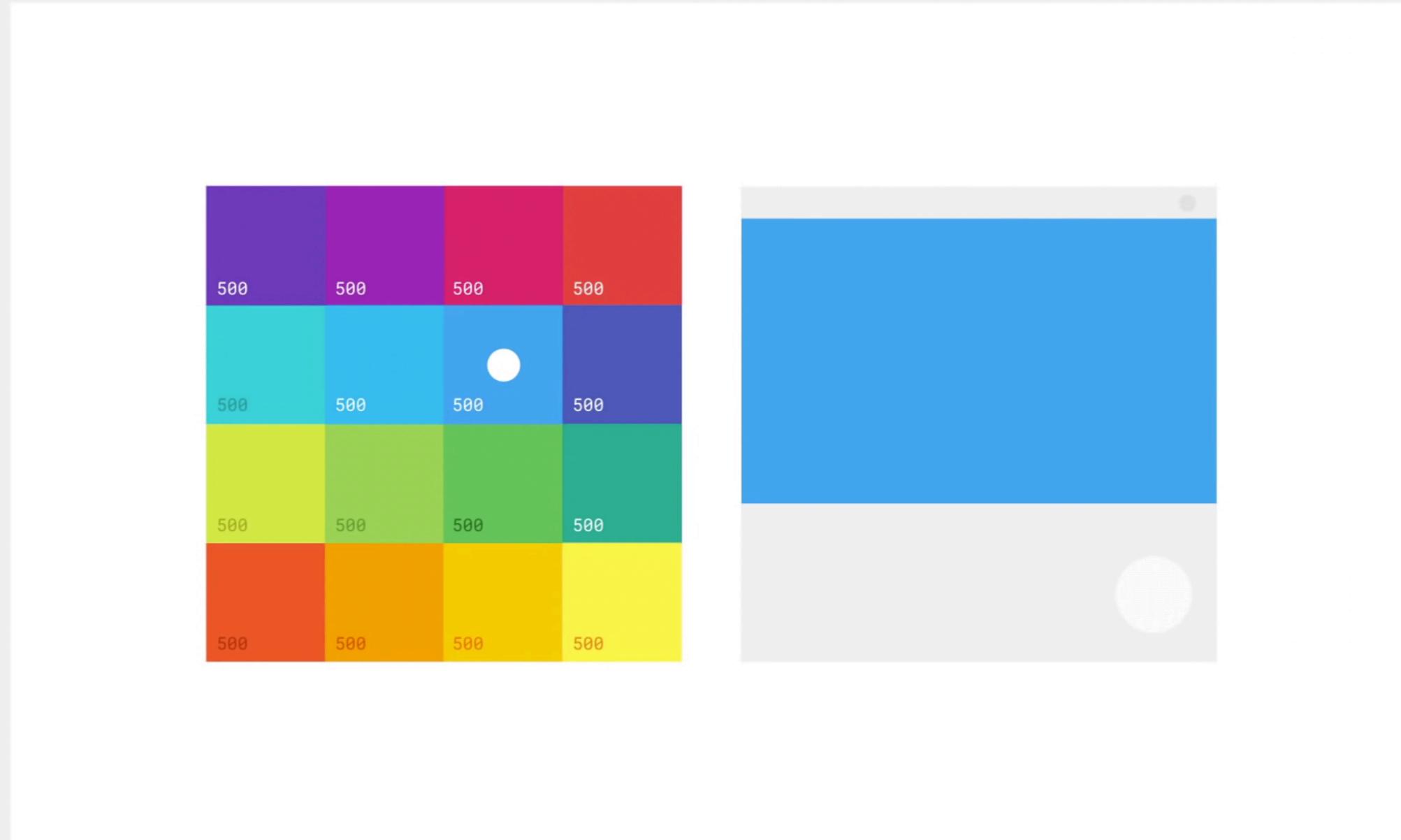
Primary – Indigo	
500	#3F51B5
100	#C5CAE9
500	#3F51B5
700	#303F9F

Accent – Pink	
A200	#FF4081
Fallback	
A100	#FF80AB
A400	#F50057

Black	
100%	#000000
12%	Dividers
26%	Disabled / Hint Text
54%	Secondary Text / Icons
87%	Text



Structure Material Colors



<http://www.google.com/design/videos/palette-perfect/>

Material Colors

primary

avoid 100% black text



secondary

hint / disabled

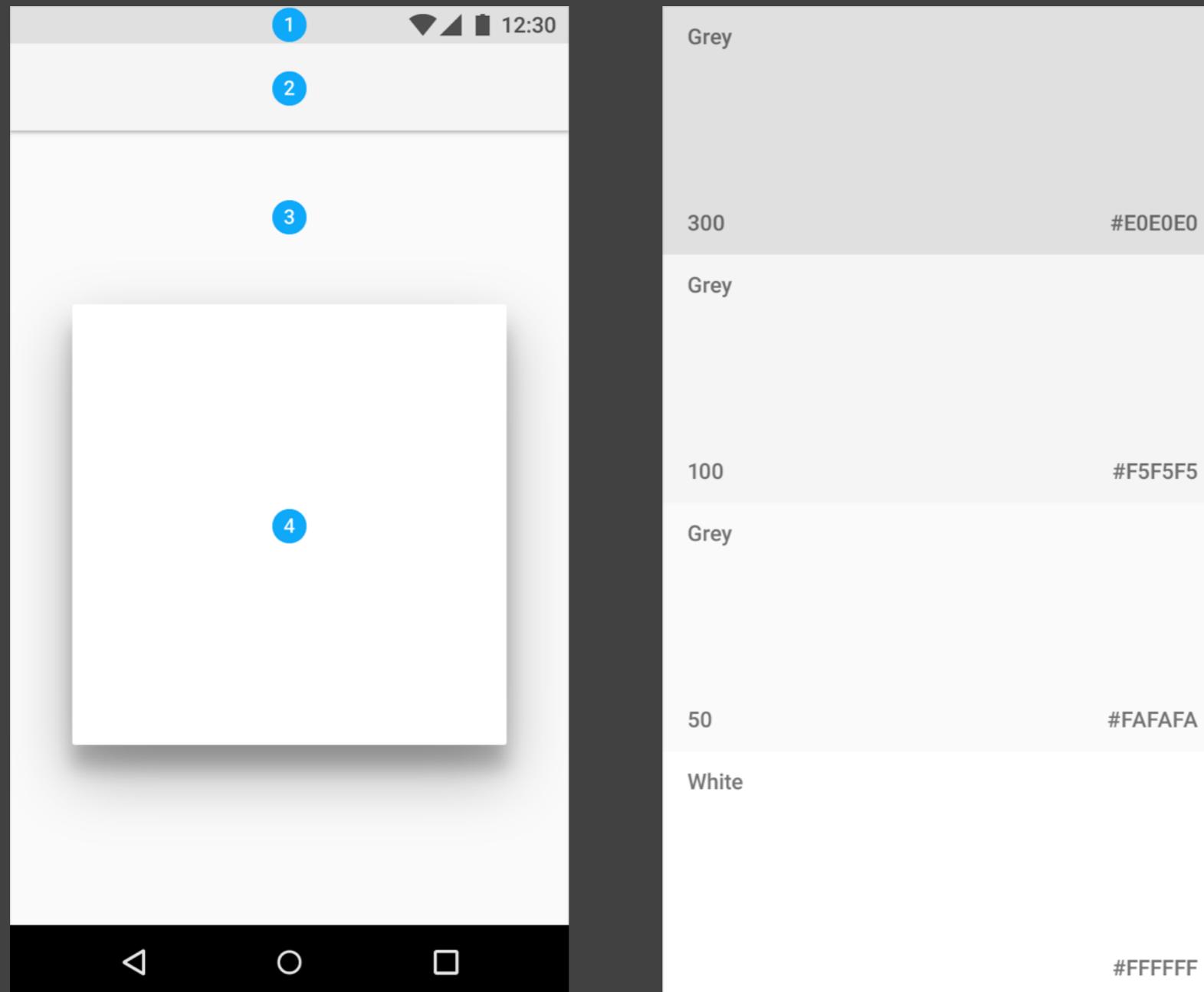
make sure they are still legible

Dark text (#000000)	Opacity
Primary text	87%
Secondary text	54%
Hint and disabled text and icons	26%

**use different levels of opacity
to establish hierarchy**

Structure

Material Colors



1. Status bar
2. App bar
3. Background
4. Cards/Dialogs

Light theme

Structure

Material Colors

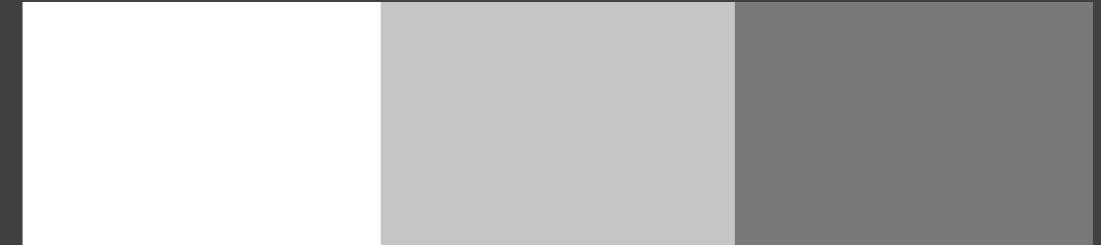
primary

use 100% white text

secondary

hint / disabled

make sure they are still legible



Light text (#FFFFFF)	Opacity
Primary text	100%
Secondary text	70%
Hint and disabled text and icons	30%

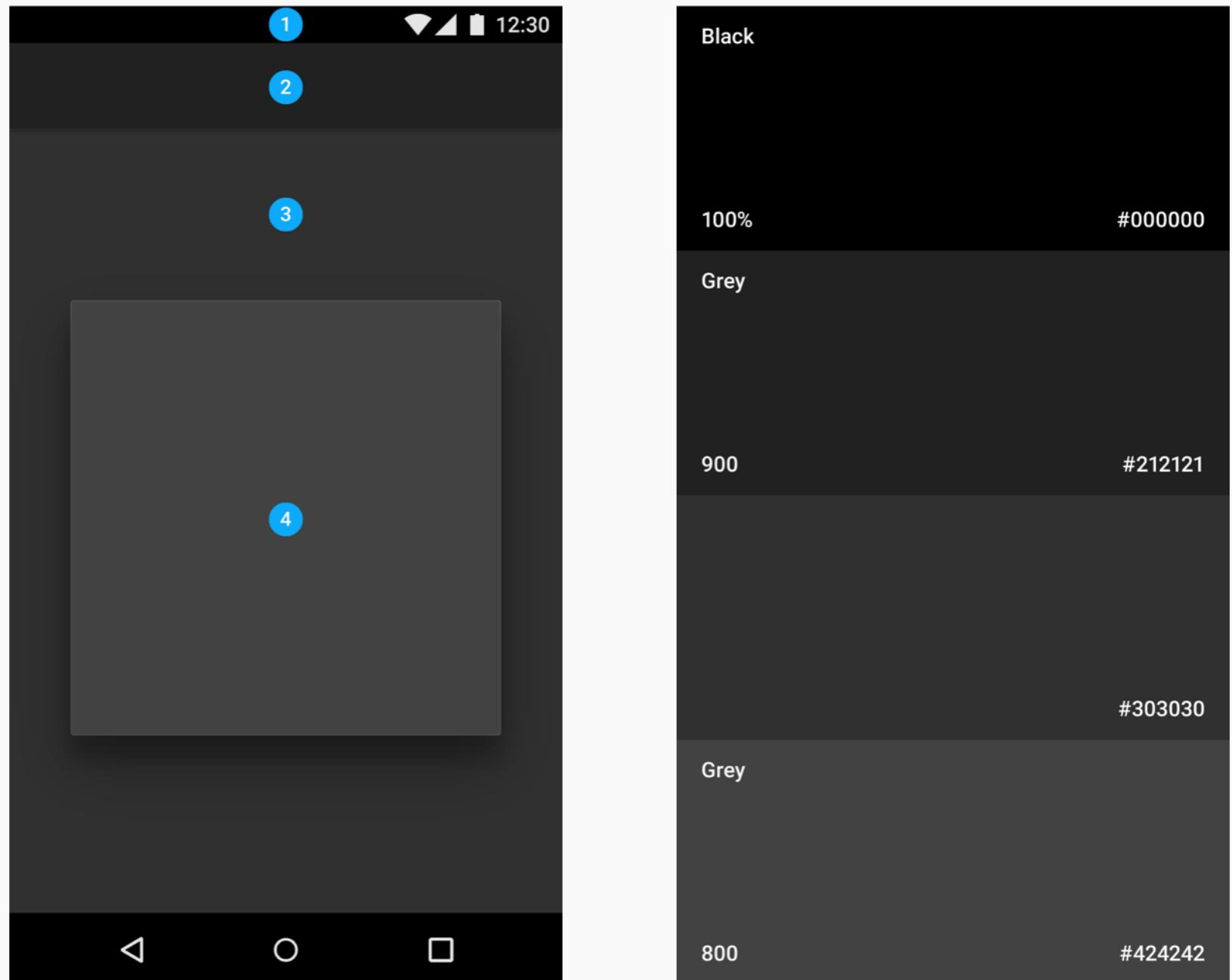
**use different levels of opacity
to establish hierarchy**

Structure

Material Colors

1. Status bar
2. App bar
3. Background
4. Cards/Dialogs

Dark theme



Structure

Material Design Guidelines

Keep in mind...

Material Design is a framework

Think about it while developing your app

Material Design Guidelines

Keep in mind...

Material Design is a framework

Think about it while developing your app

You are free to adapt the principles to your own brand

Structure Cards

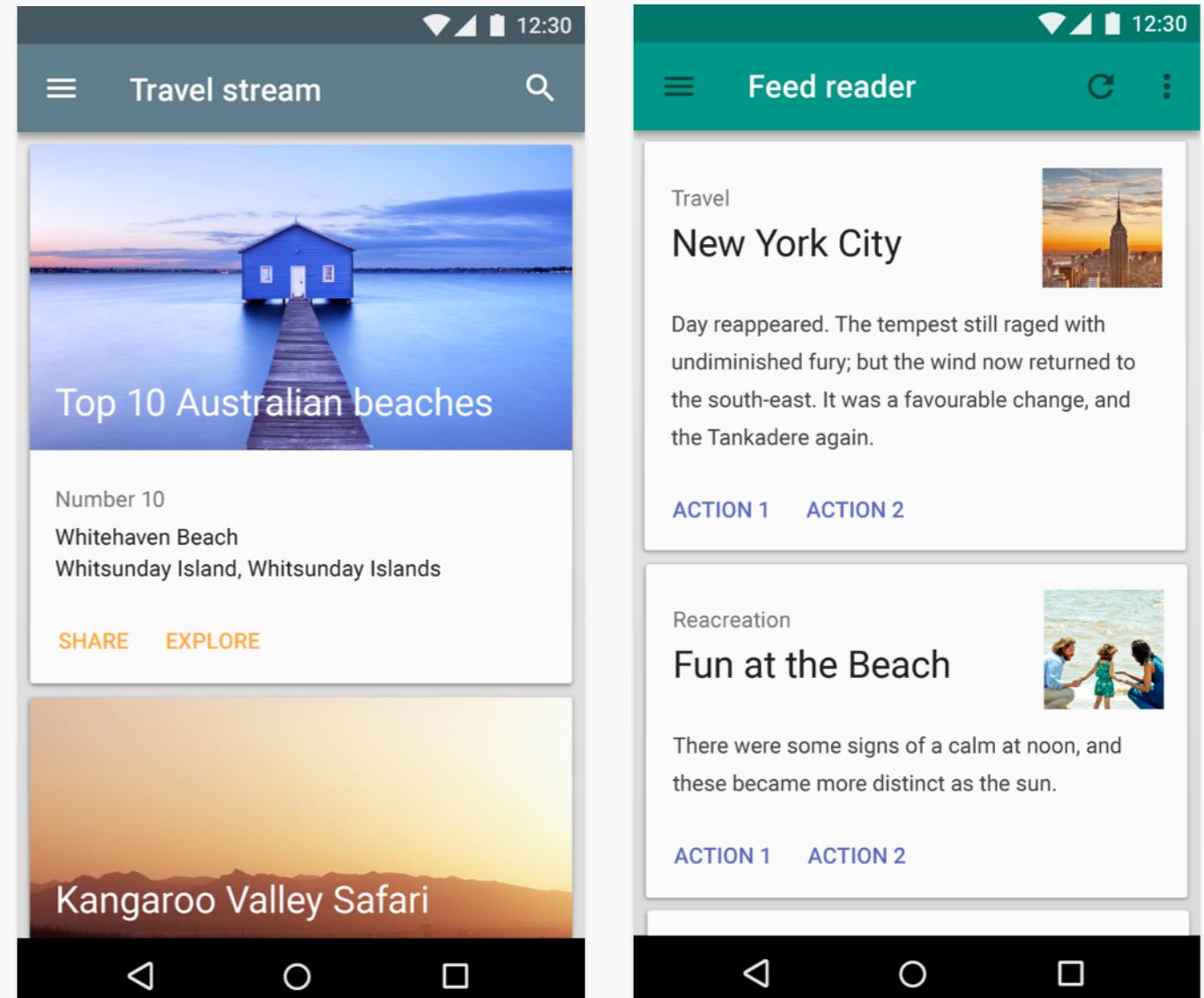
Content composed of different elements

Text, images, actions

Entry point for more complex data

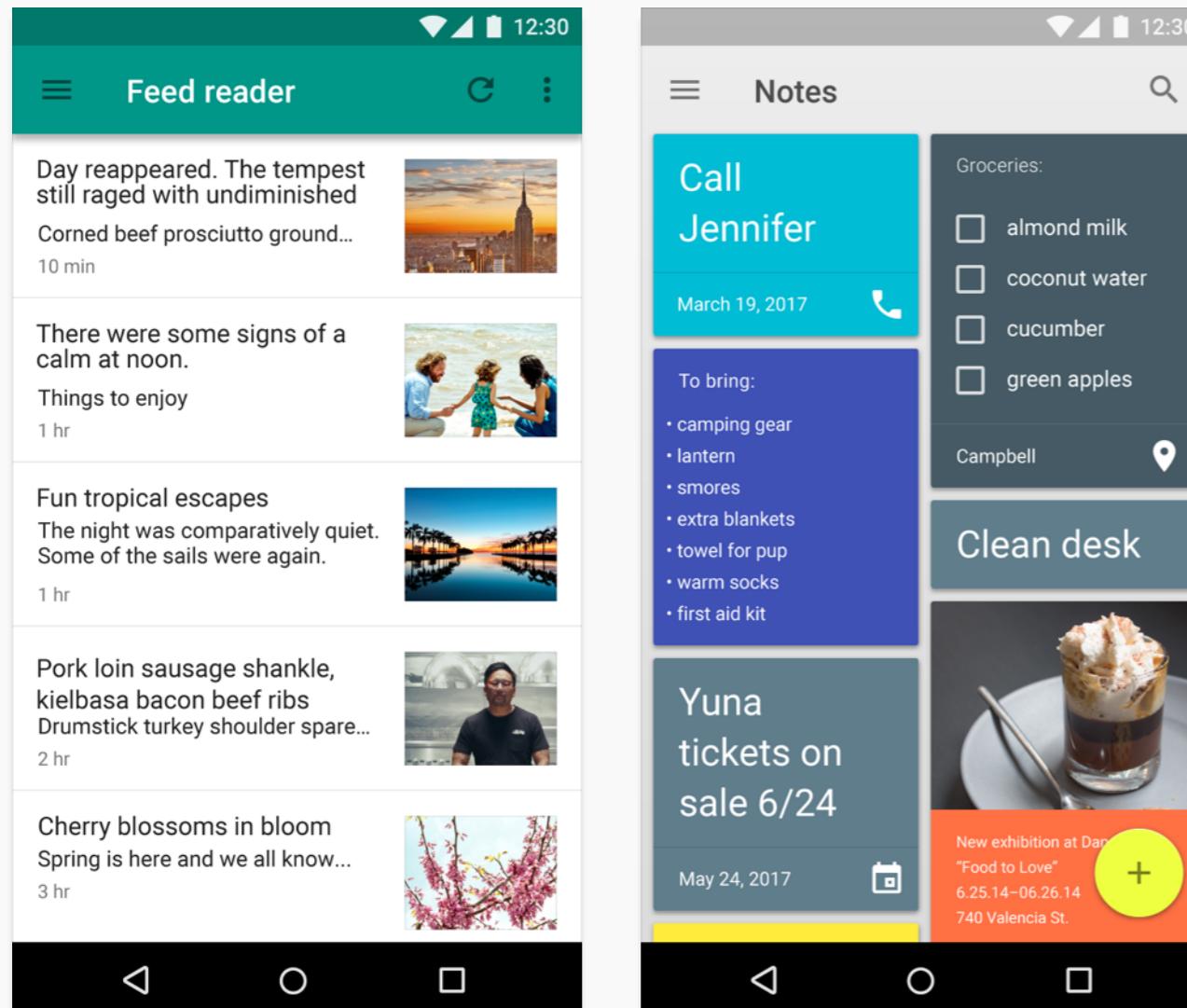
Interaction using gestures or buttons

Great responsive element



Z-position behind App Bar

Structure Cards



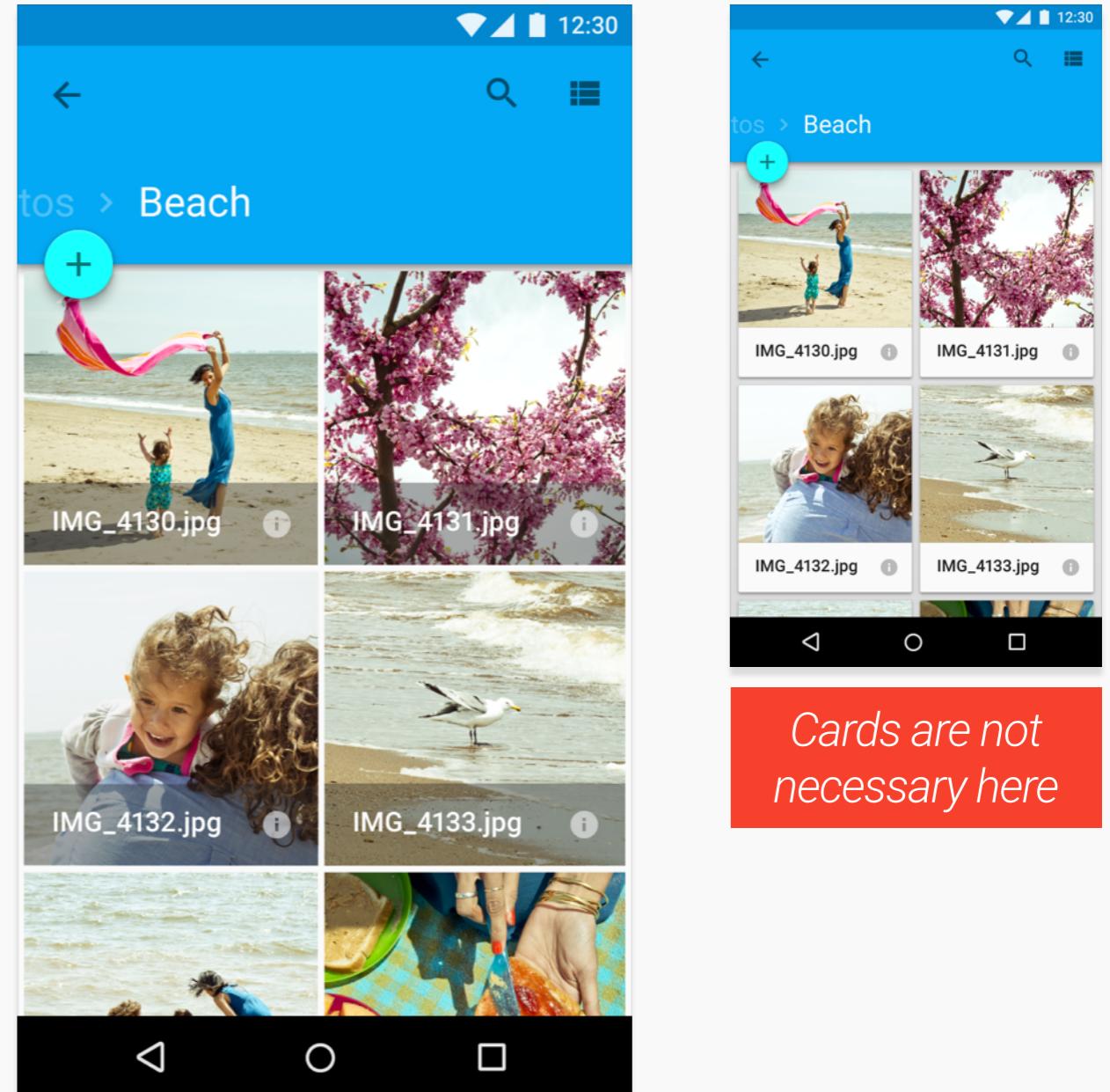
Keep in mind

For lists of homogeneous content, cards can distract the user to information

Structure Cards

Keep in mind

Grid titles work better
for images



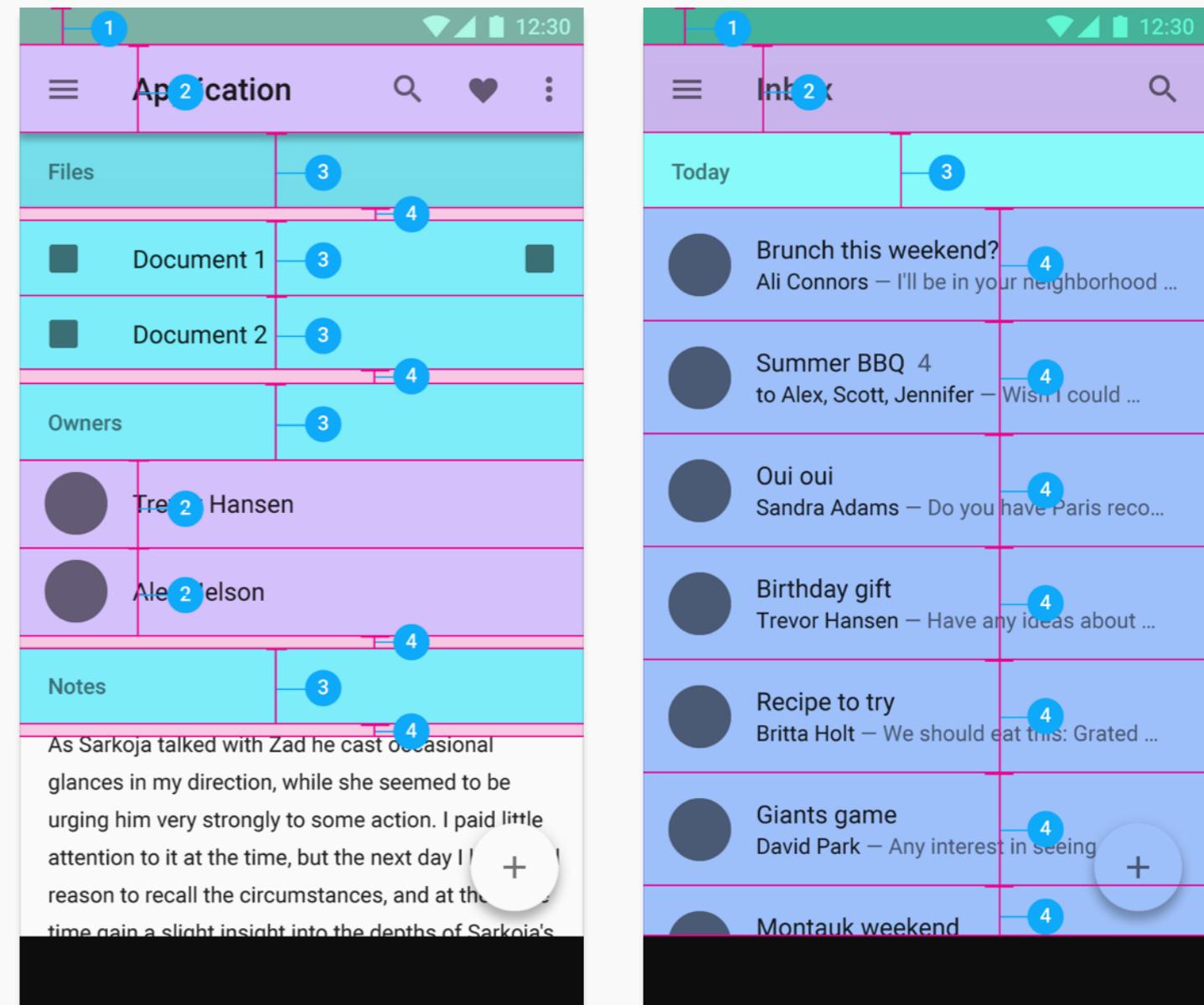
Structure White space

White space is a
design tool

Similar to punctuation
in writing

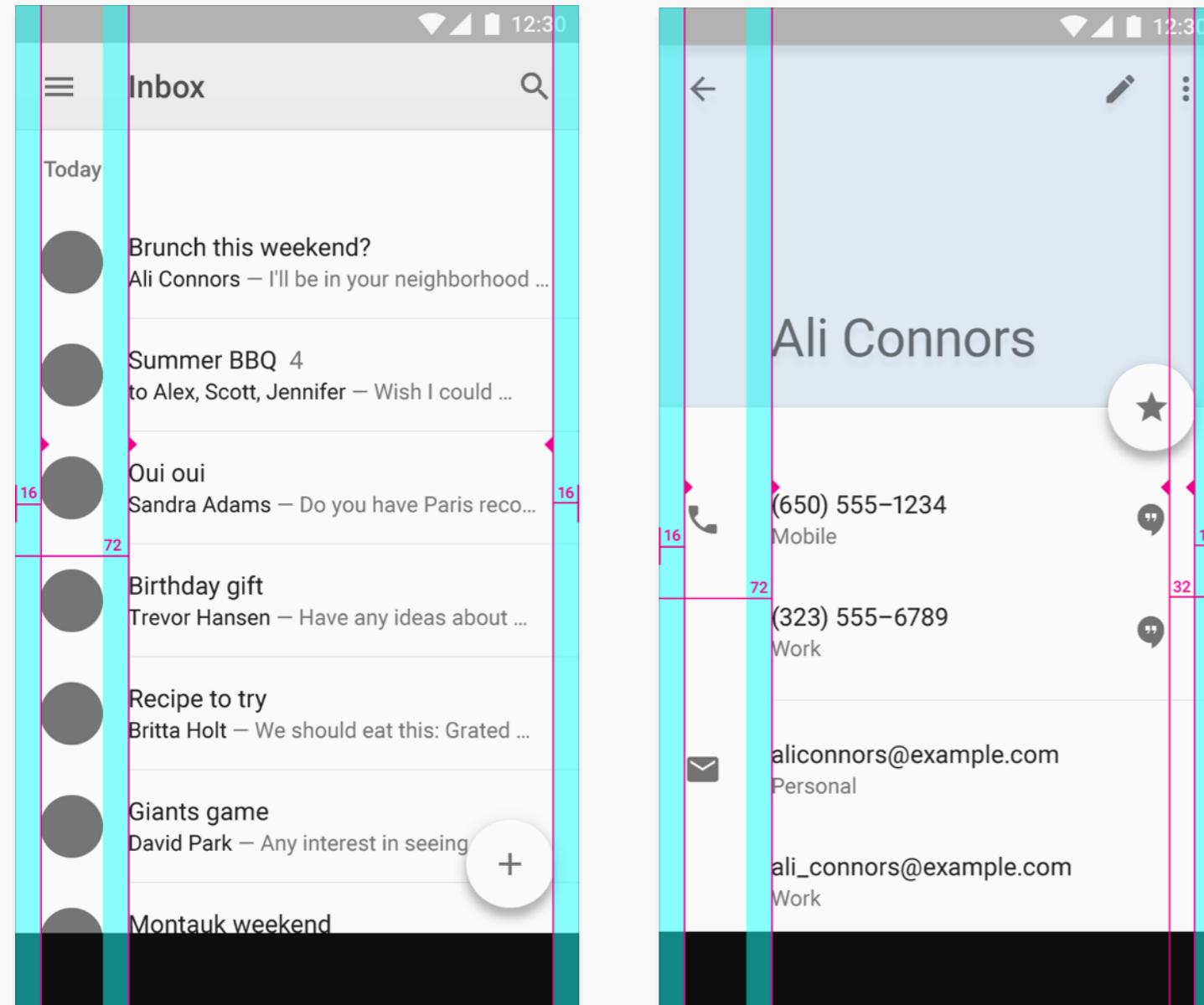
Enhances usability
and readability

Not a fashion statement



<https://www.google.com/design/spec/layout/metrics-keylines.html#metrics-keylines-spacing>

Structure White space



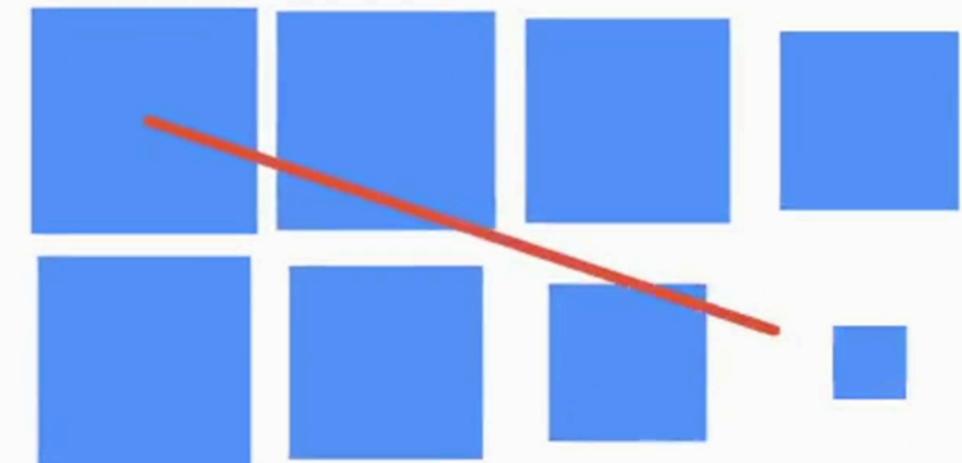
Consider the
alignment of the
app elements

makes your design more
neat and organized

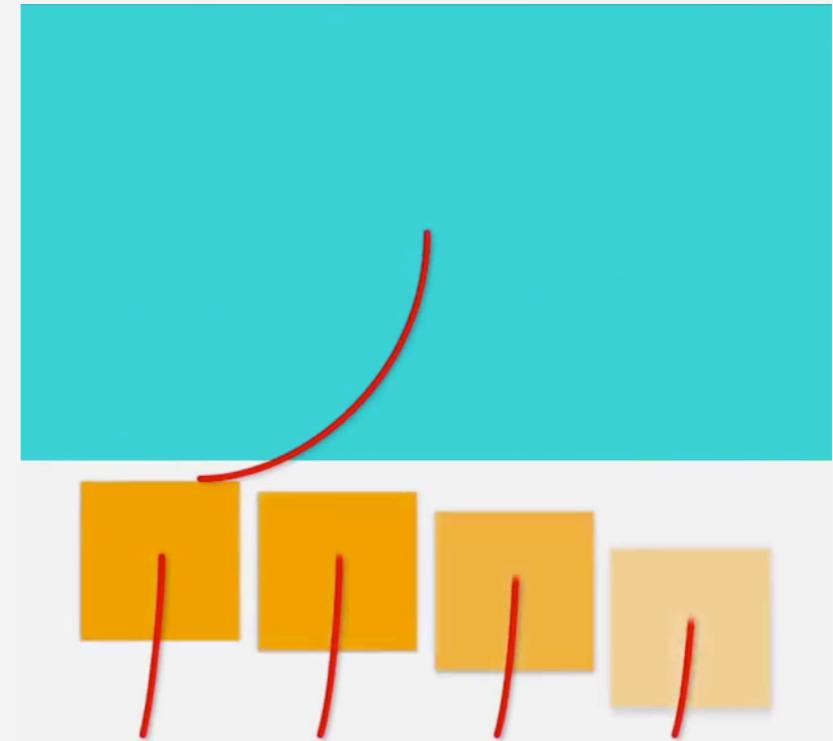
your users will find what
they want without
frustration

Structure Animations

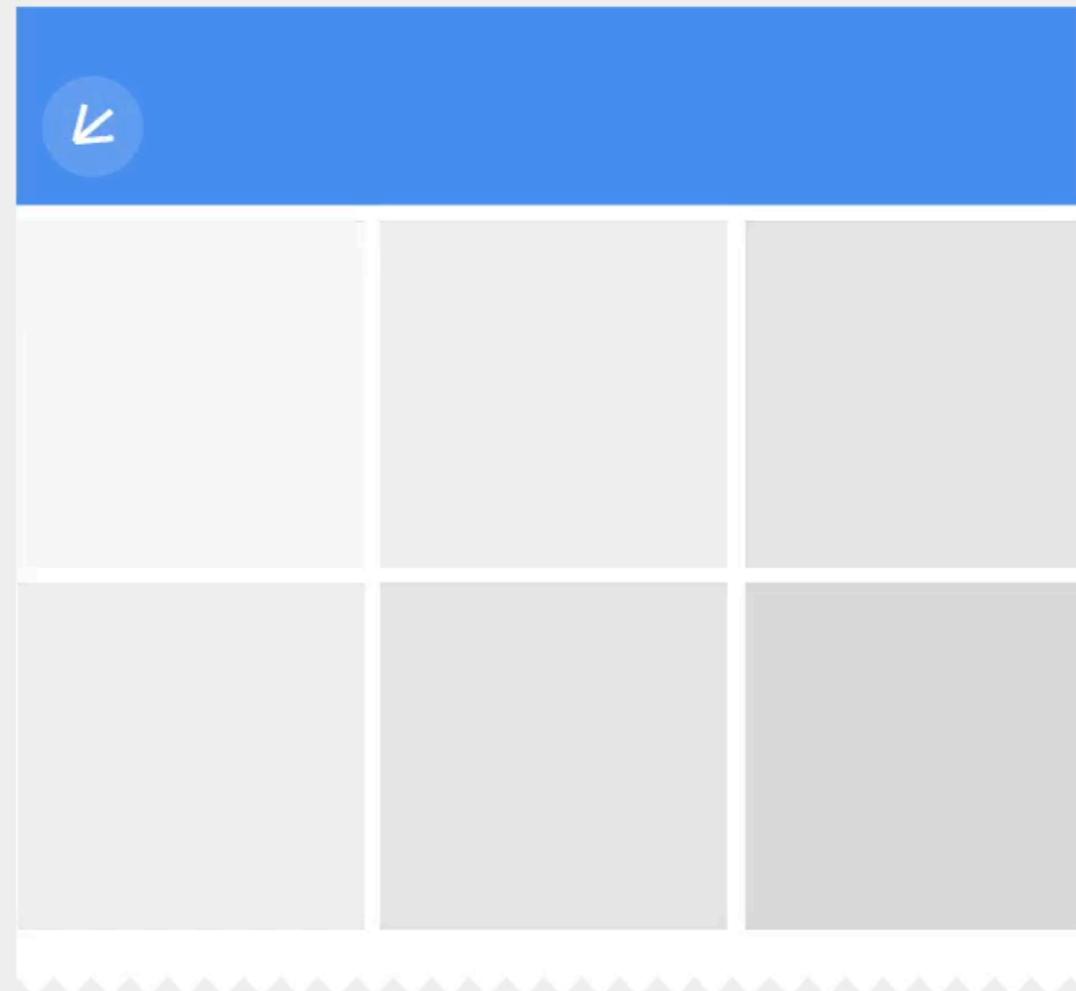
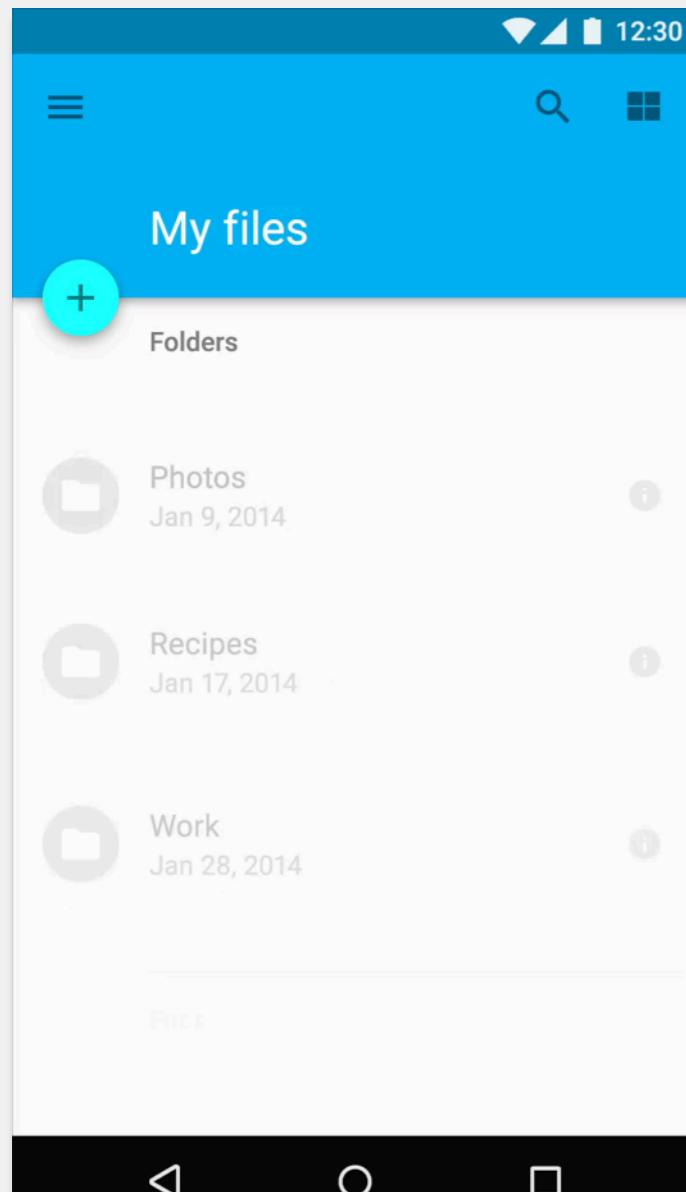
Meaningful
effectively guide the
user's attention



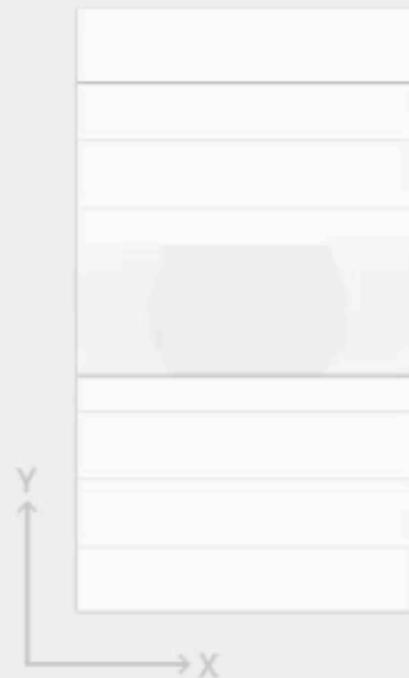
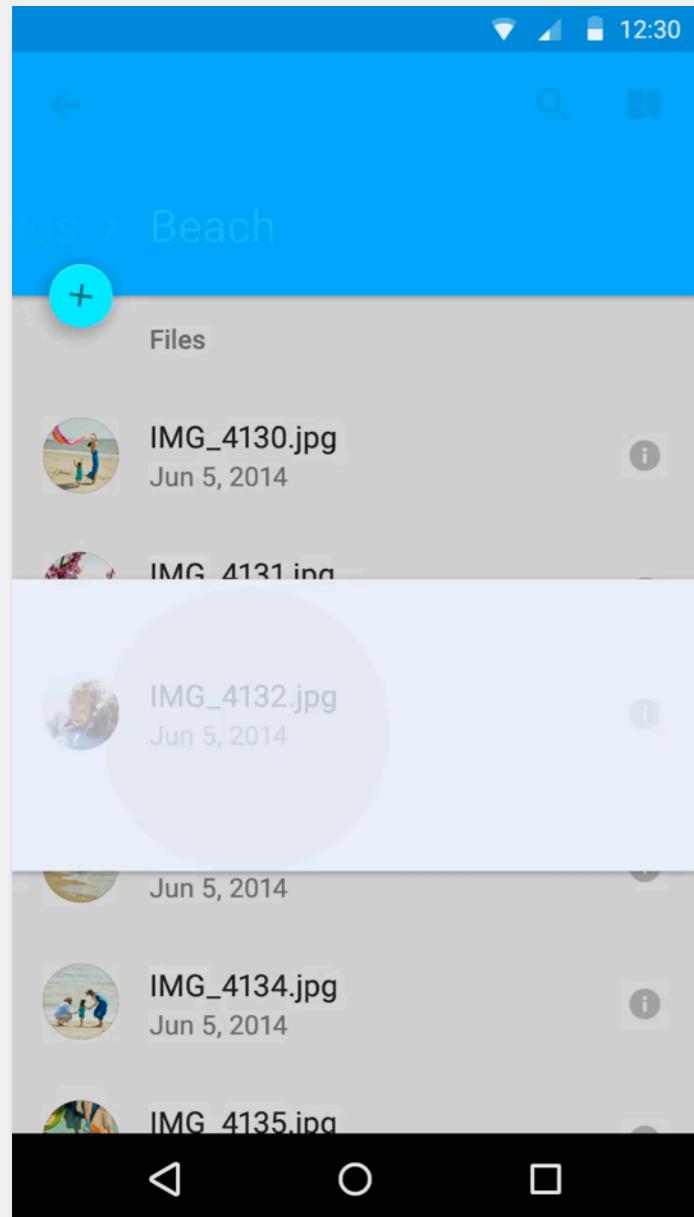
Composition rhythm
animations occur in orderly fashion



Structure Animations



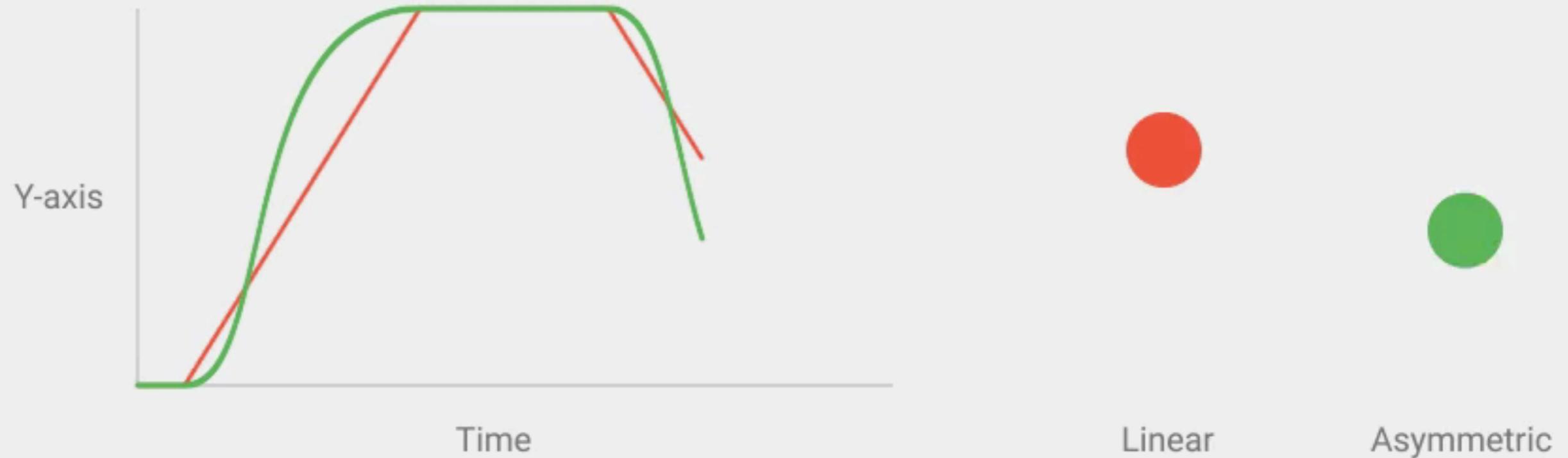
Structure Animations



Structure Animations

Ease-in, ease-out

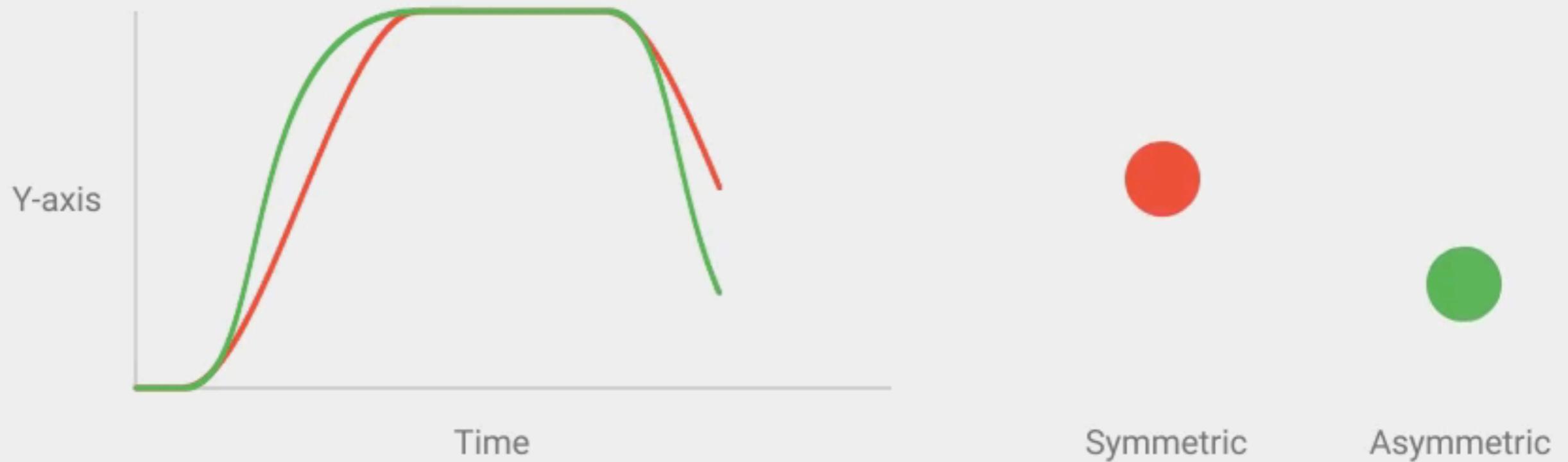
abrupt starts, stops, or changes in direction, they appear unnatural



<https://www.google.com/design/spec/animation/authentic-motion.html#>

Structure Animations

Natural acceleration and deceleration items have mass and weight



<https://www.google.com/design/spec/animation/authentic-motion.html#>

Structure Animations

Keep in mind



Don't let animations
get in the way of the
user

<https://www.youtube.com/watch?v=M6fRMy0zHol>

Structure

Typography

Roboto Thin
Roboto Light
Roboto Regular
Roboto Medium
Roboto Bold
Roboto Black
Roboto Thin Italic
Roboto Light Italic
Roboto Italic
Roboto Medium Italic
Roboto Bold Italic
Roboto Black Italic

Quantum Mechanics
 6.626069×10^{-34}
One hundred percent cotton bond
Quasiparticles
It became the non-relativistic limit of quantum field theory
PAPERCRAFT
Probabilistic wave - particle wavefunction orbital path
ENTANGLED
Cardstock 80lb ultra-bright orange
STATIONERY
POSITION, MOMENTUM & SPIN

REGULAR
THIN
BOLD ITALIC
BOLD
CONDENSED
LIGHT ITALIC
MEDIUM ITALIC
BLACK
MEDIUM
THIN
CONDENSED LIGHT

Roboto is the recommended font

<https://github.com/google/roboto>

Structure Consistency

Be aware of
established patterns

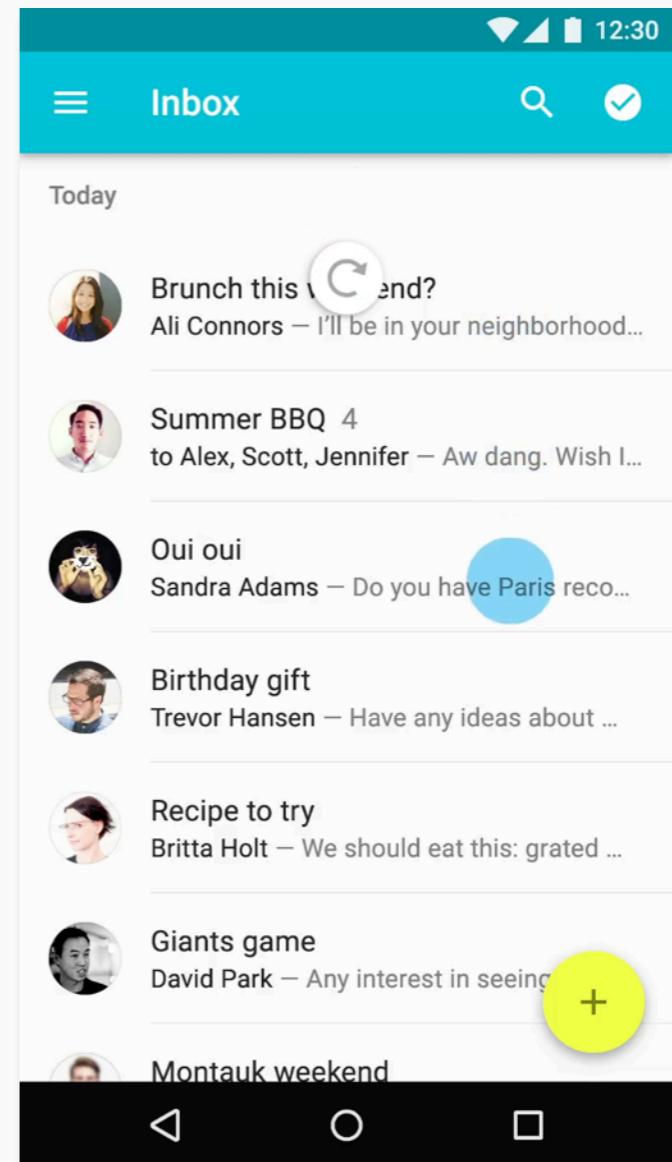
when using system icons,
check their original meaning



Structure Consistency

New pattern
tradeoff

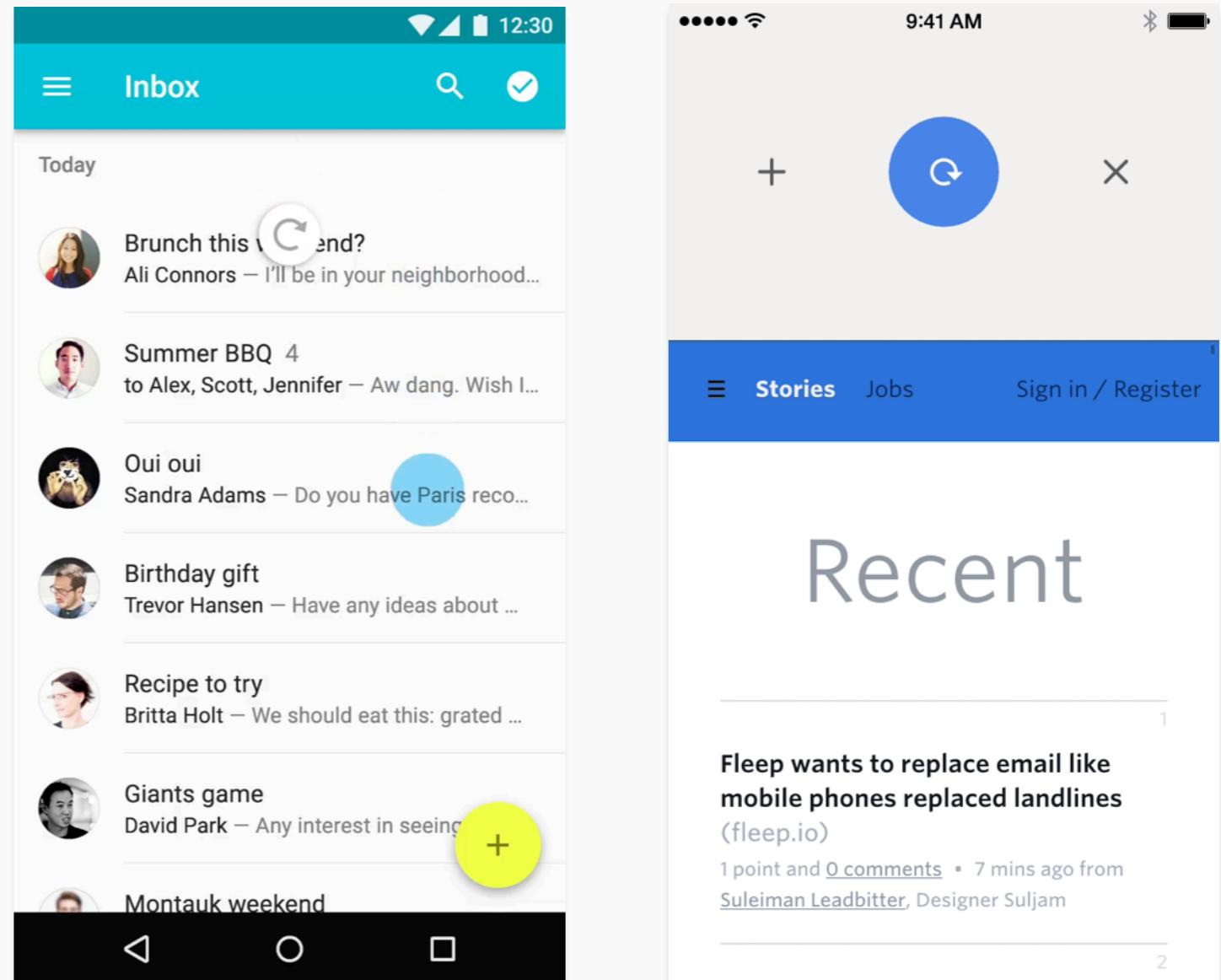
consider the cost of
learning something new



Structure Consistency

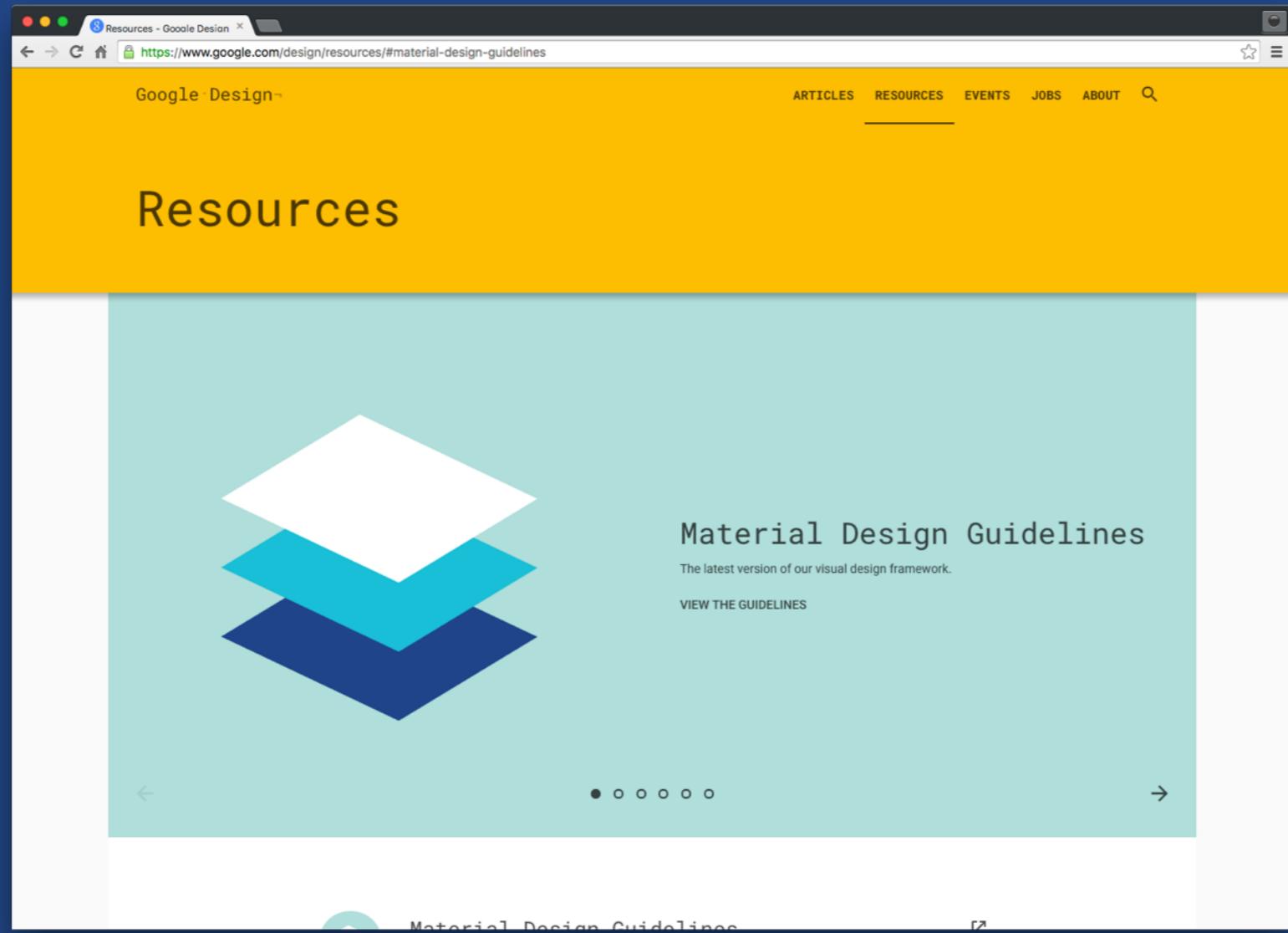
New pattern
tradeoff

consider the cost of
learning something new



Structure

More details at
[google.com/design](https://www.google.com/design/resources/#material-design-guidelines)



Dev Tools

How to get your app
to be "Materialised"

<http://bit.ly/andevcon-material>

<https://github.com/IntrepidPursuits/andevcon-material-design>

Check out the demo app!

view code examples

play around with it

apply it in your own projects!



Elevation Property



Render shadows and lightning effects appropriately
elevation set in dp

All material objects, regardless of size, have a resting elevation, consistent across apps
all material is 1dp thick

Elevation Property



xml

```
<!--On Lollipop devices, it's as simple as setting the elevation property-->
<!--Note: If you want to animate the elevation, use translationZ-->
```

```
<View
    android:layout_width="100dp"
    android:layout_height="100dp"
    android:elevation="10dp"/>
```

```
<!--On older devices, you have to add shadows to most views manually (try using a 9-patch!)-->
<!--However, CardViews and FloatingActionButtons *will* display shadows on pre-Lollipop devices-->
```

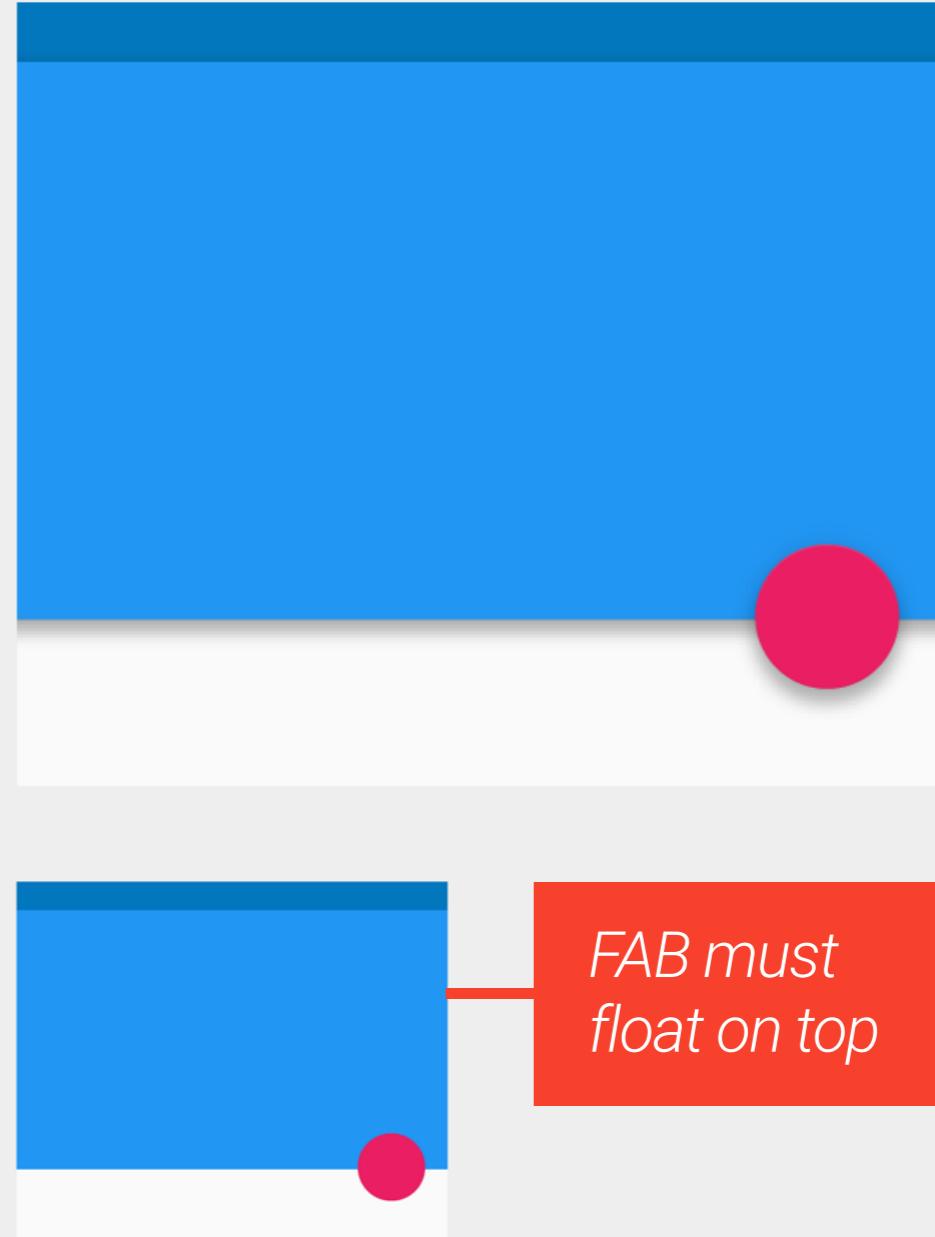
Elevation Property

Keep in mind

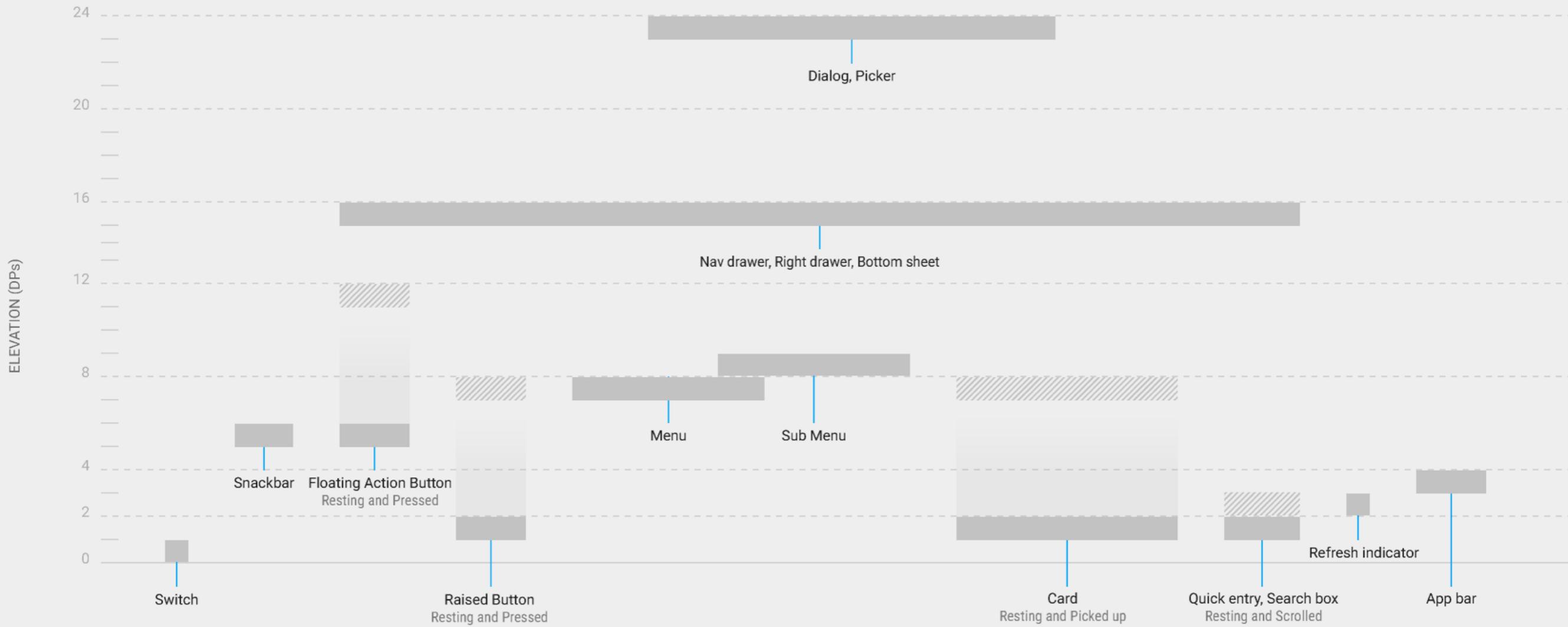
Material cannot pass through other material

Components can move or be removed before they cause interference

Design the app to minimize opportunities of interference



Elevation Property



Some classes have elevation built in

<https://developer.android.com/reference/android/support/v7/widget/CardView.html>

<https://developer.android.com/reference/android/support/design/widget/FloatingActionButton.html>

Dev Tools

Elevation Property

Elevation (dp)	Component
24	Dialog Picker
23	
22	
21	
20	
19	
18	
17	
	Nav drawer
16	Right drawer Bottom Sheet
15	
14	
13	
12	Floating action button (FAB - pressed)
11	
10	
9	Sub menu (+1dp for each sub menu)

14	
13	
12	Floating action button (FAB - pressed)
11	
10	
9	Sub menu (+1dp for each sub menu)
8	Menu Card (picked up state) Raised button (pressed state)
7	
6	Floating action button (FAB - resting elevation) Snackbar
5	
4	App Bar
3	Refresh indicator Quick entry / Search bar (scrolled state)
2	Card (resting elevation) Raised button (resting elevation) Quick entry / Search bar (resting elevation)
1	Switch

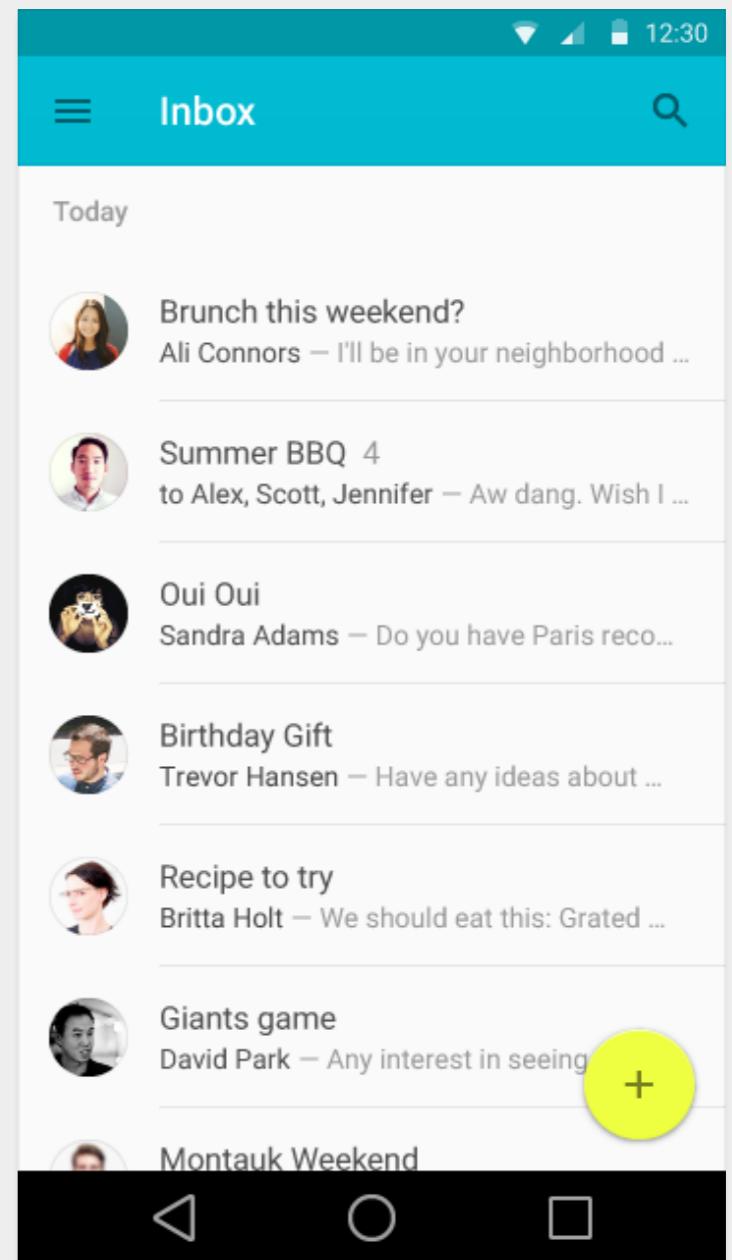
<https://www.google.com/design/spec/spec/what-is-material/elevation-shadows.html#elevation-shadows-elevation-android->

Dev Tools

FAB

A clear call to action to one of your app most relevant features

Available in the Android Support Design library, as of version 22.



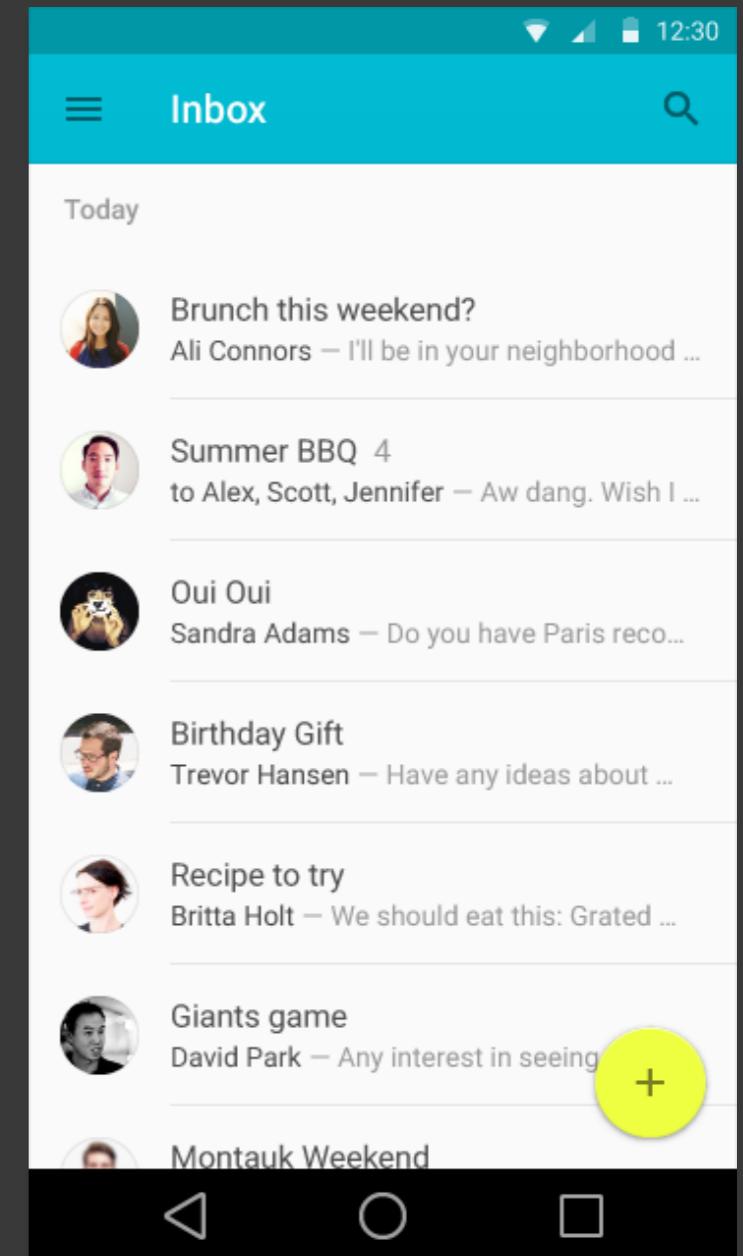
Dev Tools

FAB

xml

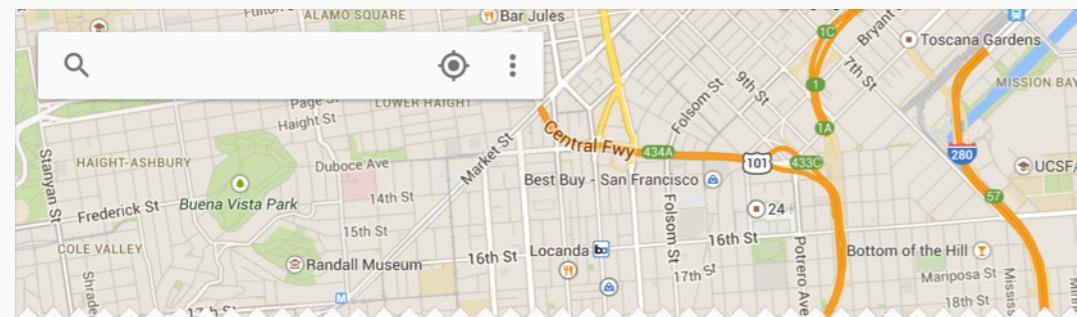
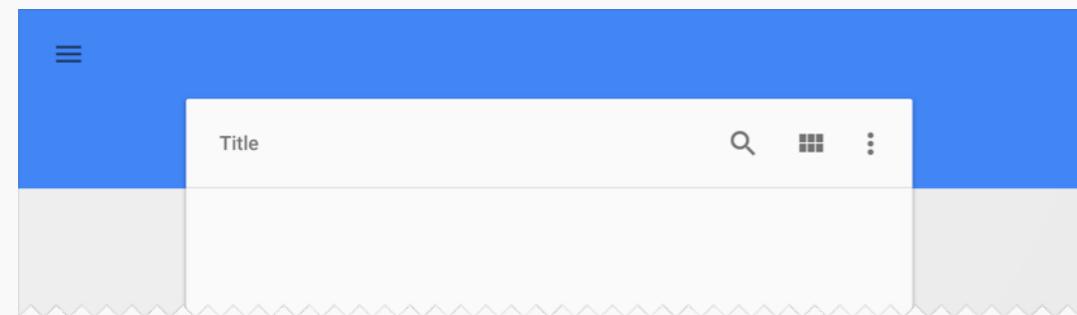
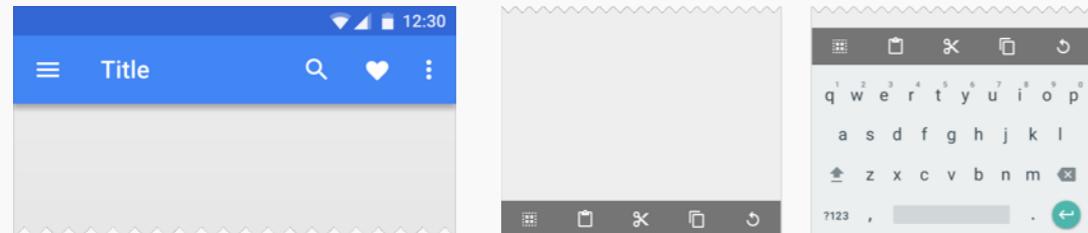
```
<!--This is just an ImageView with some FABulous extra properties-->
<android.support.design.widget.FloatingActionButton
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_alignParentEnd="true"
    android:layout_gravity="bottom"
    android:src="@drawable/ic_close"
    app:elevation="10dp"
    app:fabSize="normal"
    app:rippleColor="@color/app_color" />

<!--other things to play with:-->
<!--app:pressedTranslationZ=""-->
<!--app:backgroundTint=""-->
<!--app:backgroundTintMode=""-->
<!--app:borderWidth=""-->
<!--and more-->
```



Dev Tools

Toolbar



The successor of the **Action Bar**

You can now customize it and place it wherever!

Dev Tools

Toolbar

styles

```
<!--res/values/styles.xml-->
<!-- Base application theme. We use NoActionBar because we are implementing our own Toolbar -->
<style name="AppTheme" parent="Theme.AppCompat.Light.NoActionBar">
    <!-- Customize your theme here. -->
    <item name="drawerArrowStyle">@style/DrawerArrowStyle</item>
</style>

<!--This is necessary for the hamburger -> arrow animation on sliding nav drawer-->
<style name="DrawerArrowStyle" parent="Widget.AppCompat.DrawerArrowToggle">
    <item name="spinBars">true</item>
</style>
```

xml

```
<!--activity_main.xml-->
<!--Toolbar sits alone at the top of your layout-->
<android.support.v7.widget.Toolbar
    android:id="@+id/toolbar"
    android:layout_width="match_parent"
    android:layout_height="wrap_content" />
```

java

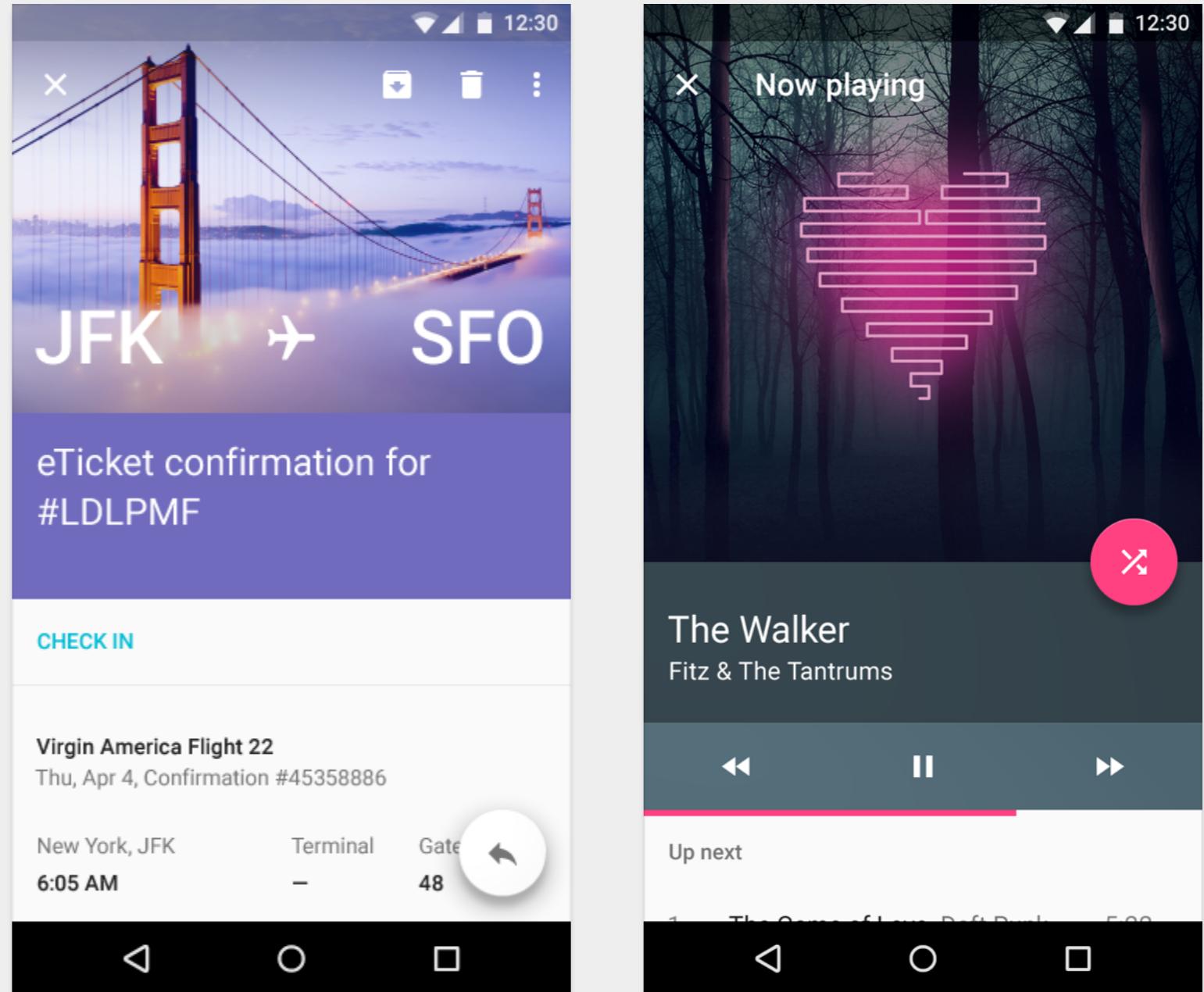
```
//MainActivity.java
Toolbar toolbar = (Toolbar) findViewById(R.id.toolbar);
/*
This line ensures that the activity will use your custom Toolbar as an ActionBar
It will add the appropriate title and inflate the associated menu.
*/
setSupportActionBar(toolbar);

/*
This code sets up the hamburger button, including the new transition to back arrow
drawerLayout contains the sliding navigation menu (shown in later slides)
*/
DrawerLayout drawerLayout = (DrawerLayout) findViewById(R.id.main_drawer);
ActionBarDrawerToggle actionBarDrawerToggle =
    new ActionBarDrawerToggle(this, drawerLayout, toolbar, R.string.open, R.string.closed);
drawerLayout.setDrawerListener(actionBarDrawerToggle);
ActionBar supportActionBar = getSupportActionBar();
if (supportActionBar != null) {
    supportActionBar.setDisplayHomeAsUpEnabled(true);
    supportActionBar.setHomeButtonEnabled(true);
}
actionBarDrawerToggle.syncState();
```

Dev Tools

Color Extraction

Taking a sample color from an adjacent image to paint an UI element.

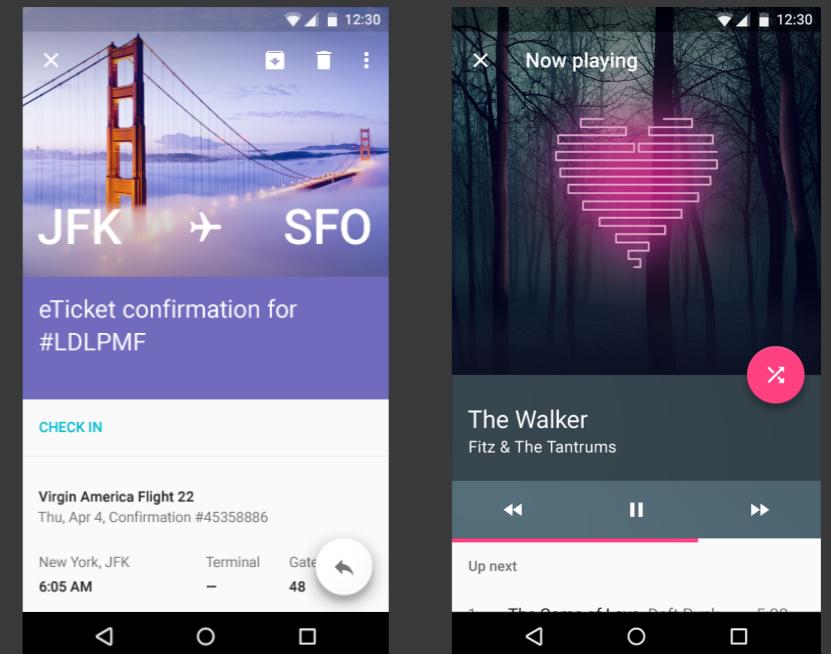


Dev Tools

Color Extraction

java

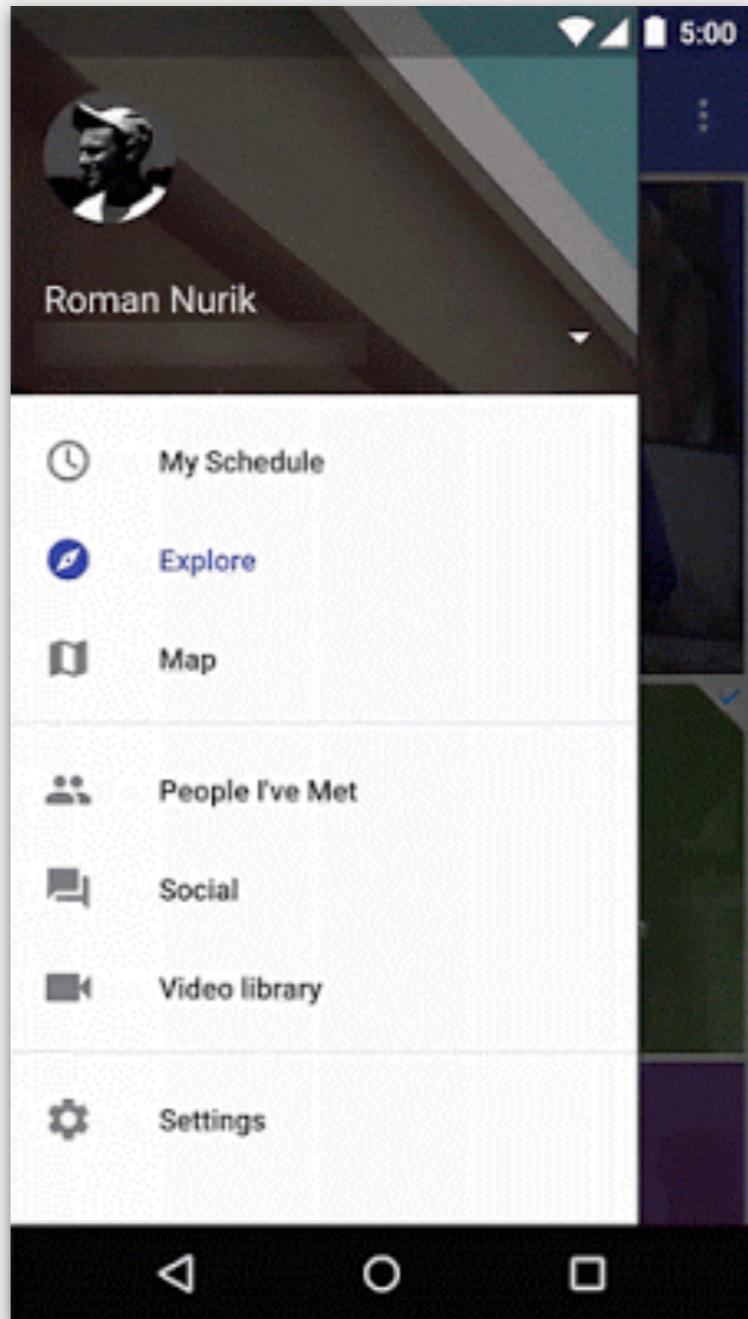
```
/*
This can take a while, but fortunately Google provides synchronous and async versions
*/
Palette.from(bitmap).generate(new Palette.PaletteAsyncListener() {
    @Override
    public void onGenerated(Palette palette) {
        /*
        many more than 2 colors to choose from in Palette object
        these two are usually nice for text
        */
        int bgColor = palette.getLightVibrantColor(DEFAULT_COLOR);
        int textColor = palette.getDarkVibrantColor(DEFAULT_COLOR);
        textView.setBackgroundColor(bgColor);
        textView.setTextColor(textColor);
    }
});
```



Dev Tools

Side Nav

Side menu accessible via
the menu icon or a slide
in from the left



Dev Tools

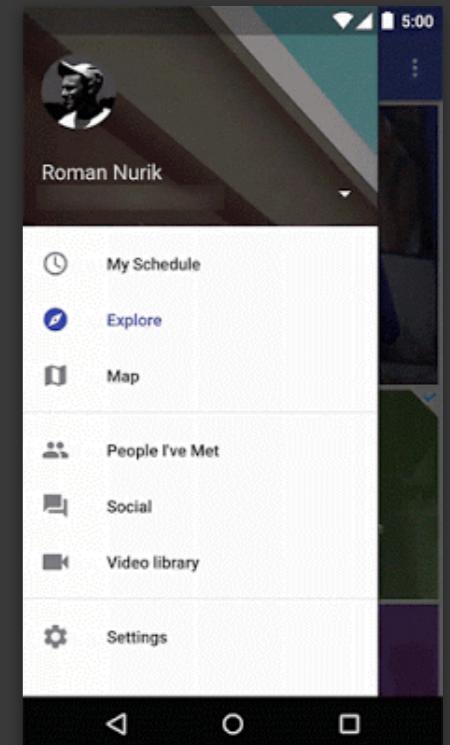
Side Nav

xml

```
<android.support.v4.widget.DrawerLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <!--Root DrawerLayout must only have two children.-->
    <!-- -->
    <!--First child is View/Fragment containing your app content-->
    <!-- -->
    <!--Second child is View/Fragment containing navigation drawer content-->

</android.support.v4.widget.DrawerLayout>
```



<https://developer.android.com/reference/android/support/v4/widget/DrawerLayout.html>

<http://developer.android.com/reference/android/support/design/widget/NavigationView.html>

Dev Tools

Ripple Effects

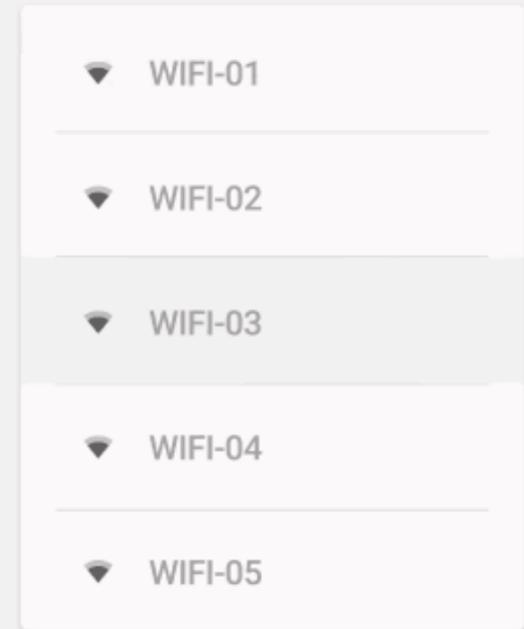
xml

```
<!--/res/drawable-v21/ripple.xml -->
<ripple xmlns:android="http://schemas.android.com/apk/res/android"
    android:color="@color/accent_material_dark">
    <item>
        <shape android:shape="rectangle">
            <solid android:color="@color/accent_material_light" />
        </shape>
    </item>
</ripple>
```

java

```
//MainActivity.java
//Important - ripples/touch feedback don't work on pre-Lollipop devices!
if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.LOLLIPOP) {
    mainButton.setBackground(getDrawable(R.drawable.ripple));
    mainButton.setText("RIPPLE BUTTON");
} else {
    mainButton.setText("YOUR DEVICE IS TOO OLD");
}
```

Keep in mind



This feature might not work on older devices

<https://developer.android.com/training/material/compatibility.html>

Dev Tools

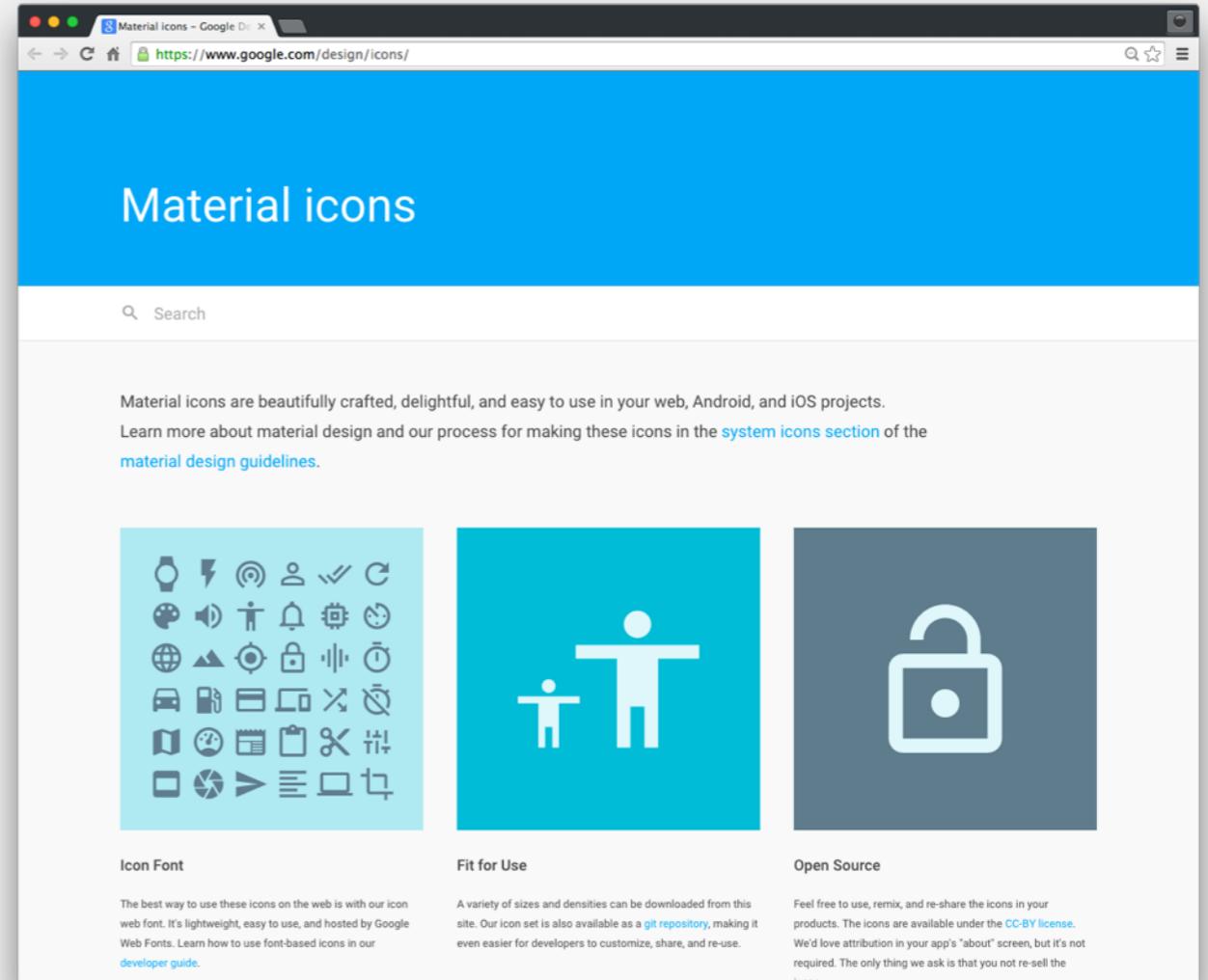
Material Icons

Open source icons

*Free to use, remix, and
re-share the icons in
your products*

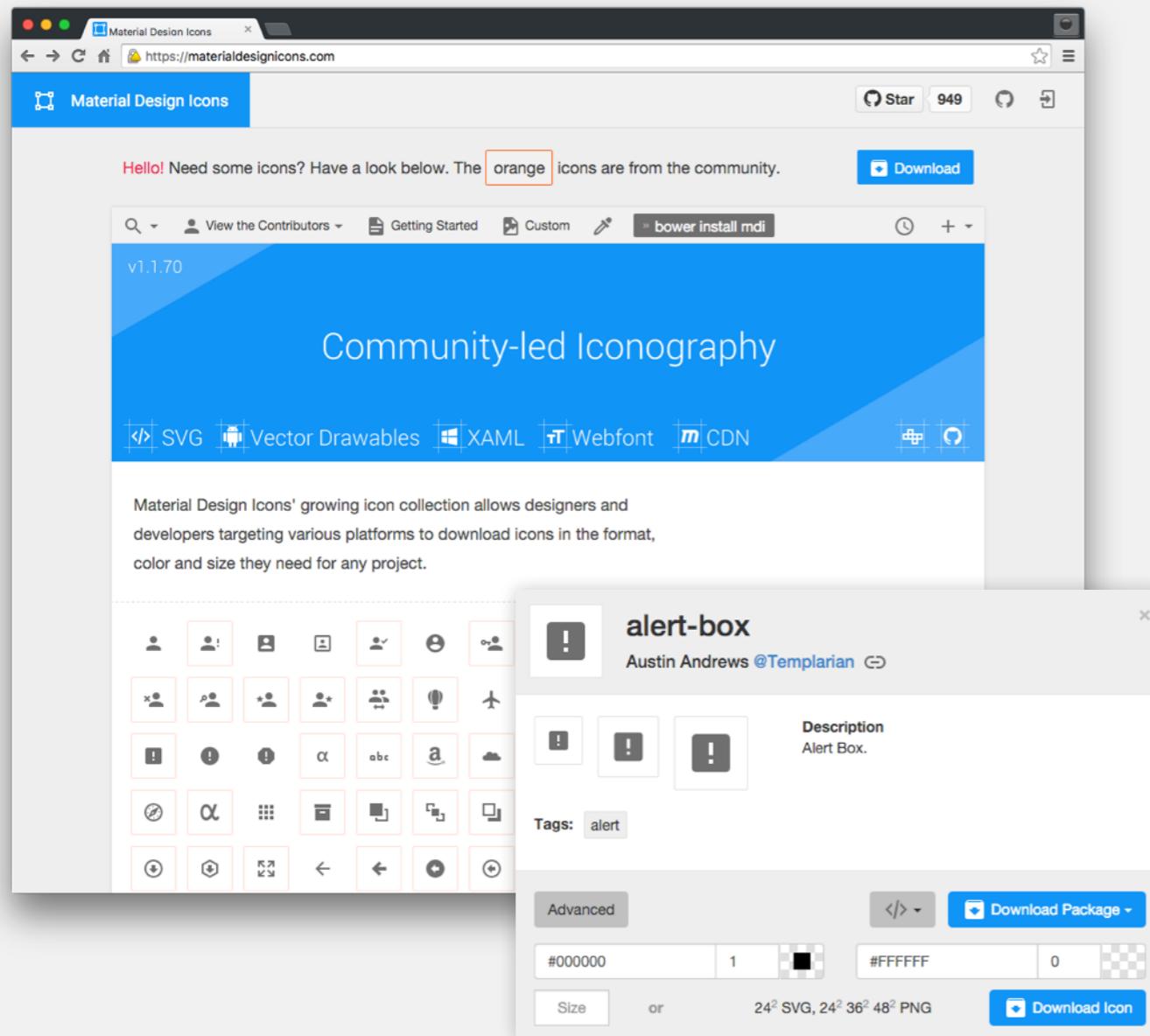
[https://www.google.com/
design/icons/](https://www.google.com/design/icons/)

[https://github.com/
google/material-design-
icons/](https://github.com/google/material-design-icons/)



Dev Tools

Material Icons



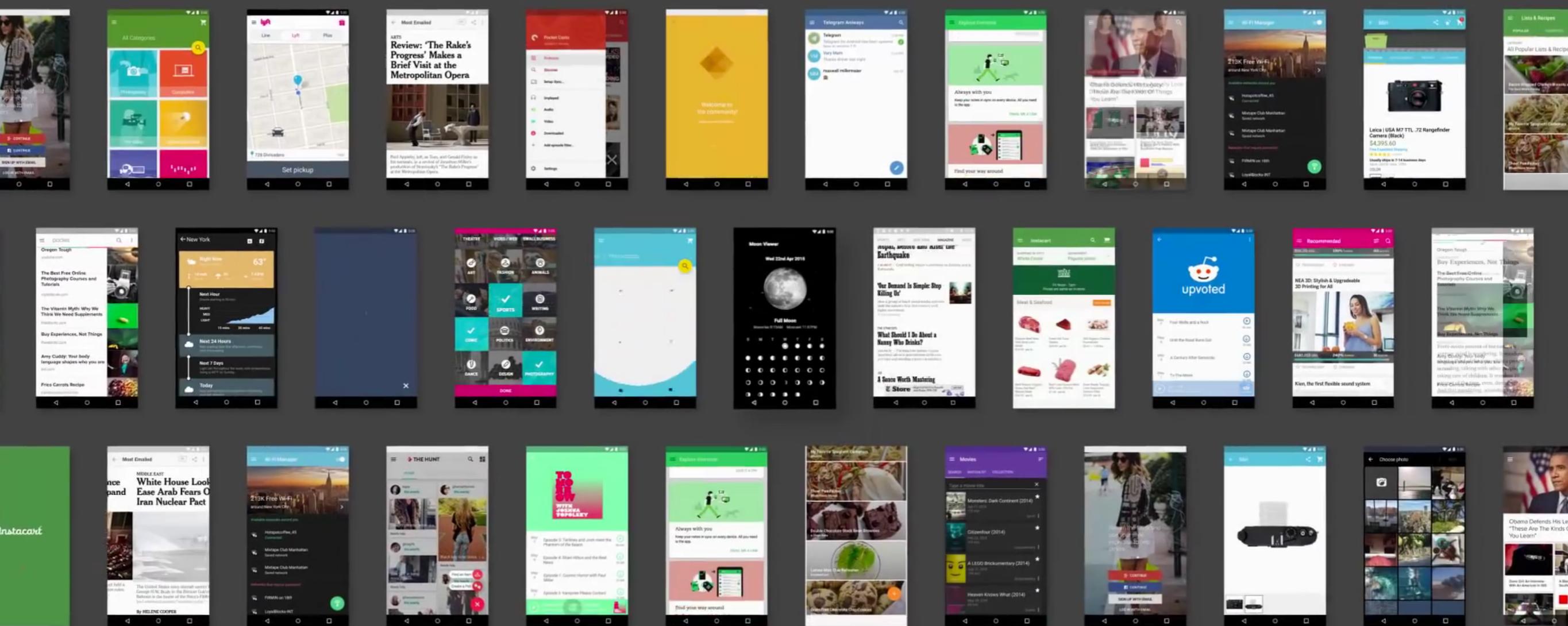
Community-led iconography

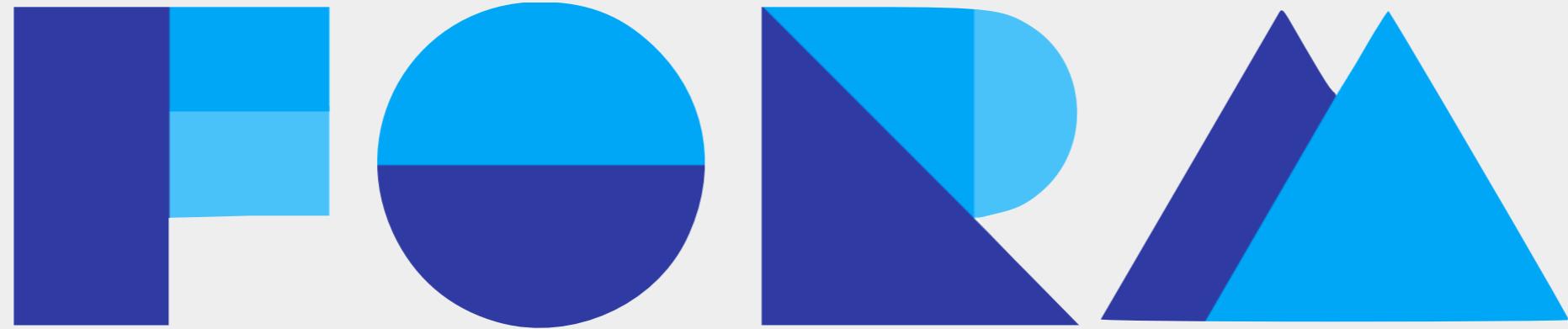
*Various formats,
change color, size*

<https://materialdesignicons.com/>

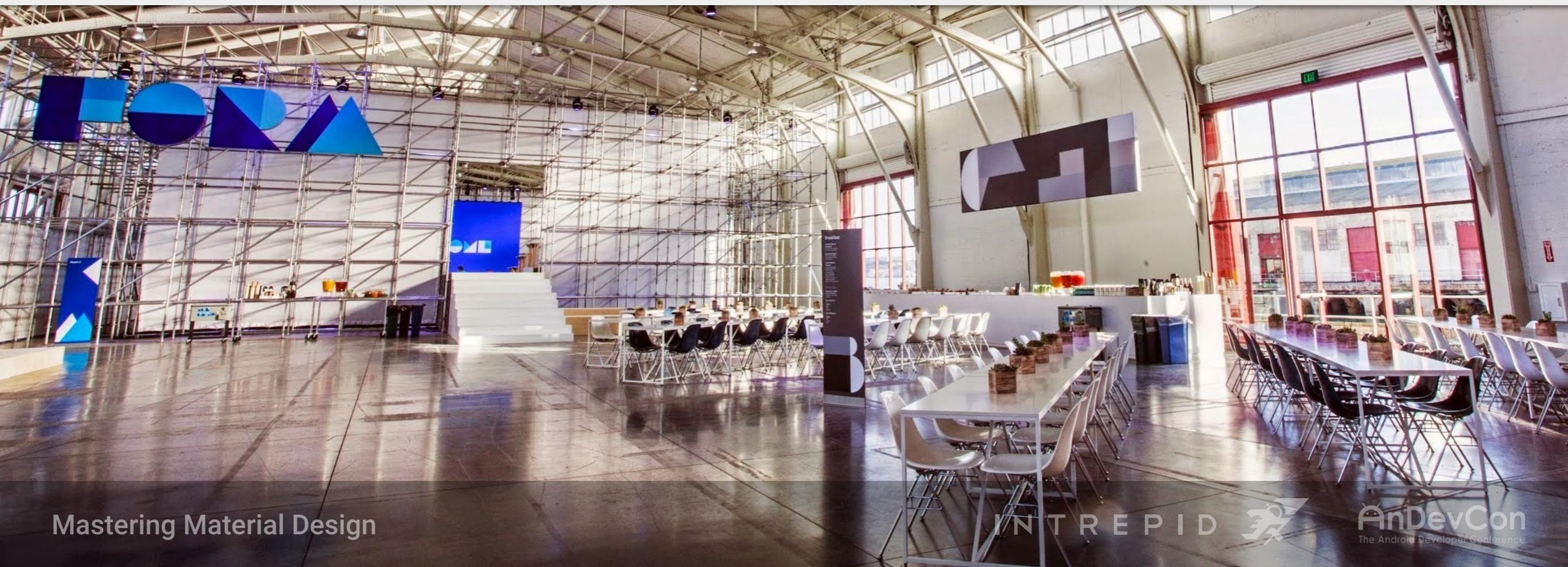
Case Studies

Material Design Awards





Wide-angle examination of the intersection
between design and technology.



Material Design Awards

<http://www.google.com/design/articles/material-design-awards/>



Material Design Awards

Delightful Animation
Tumblr

Immersive Imagery
B&H Photo Video

Adaptive Layouts
Pocket

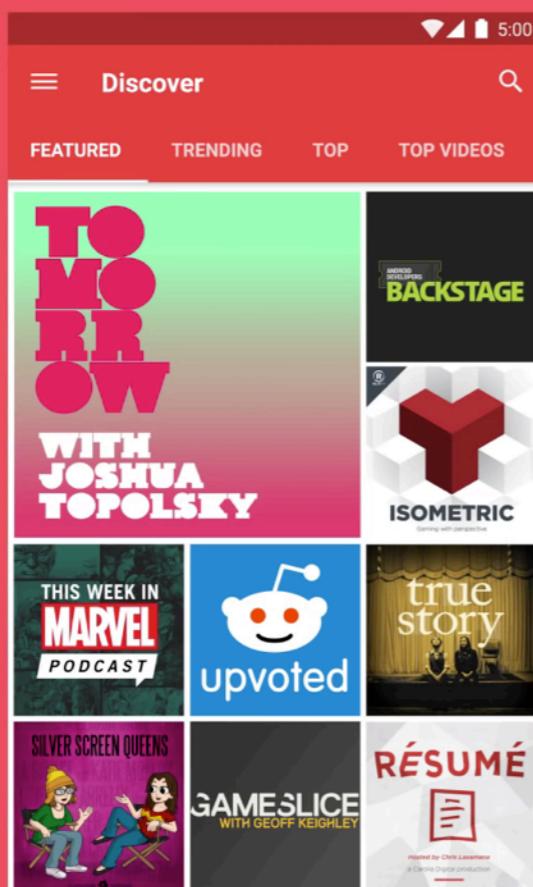
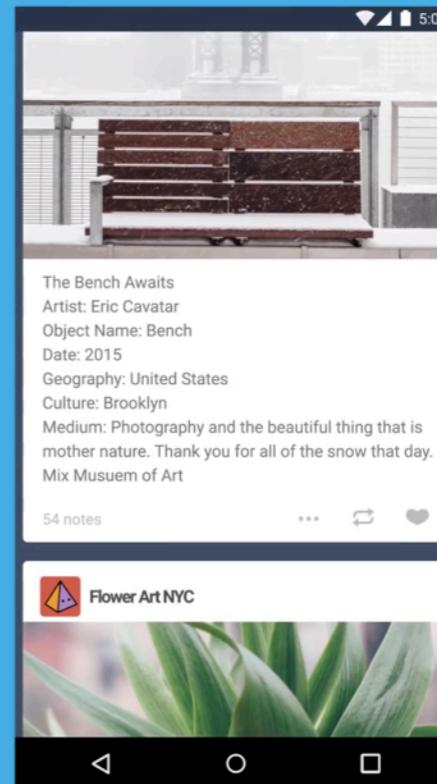
Crafted Simplicity
Weather Time

Elegant Typography
New York Times

Seamless Browsing
Pocket Casts

Delightful Animation

Tumblr

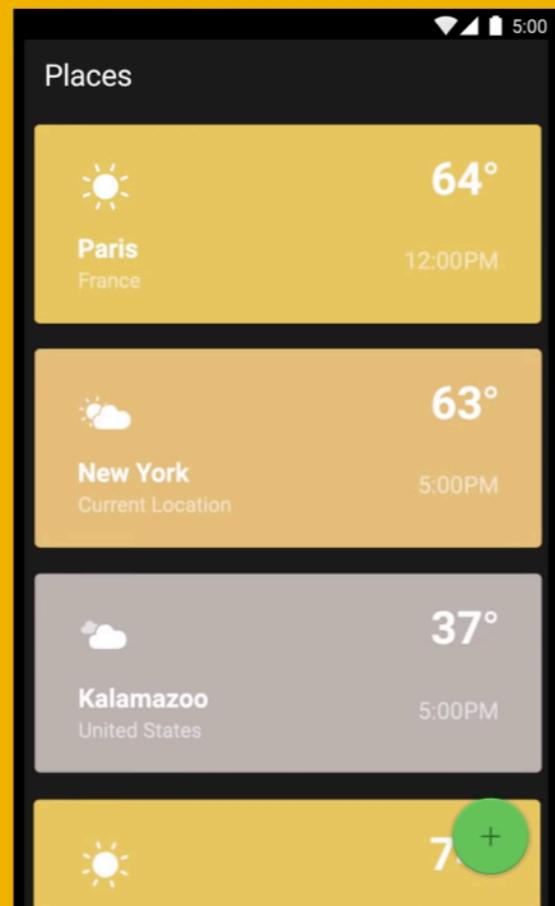


Seamless Browsing

Pocket Casts

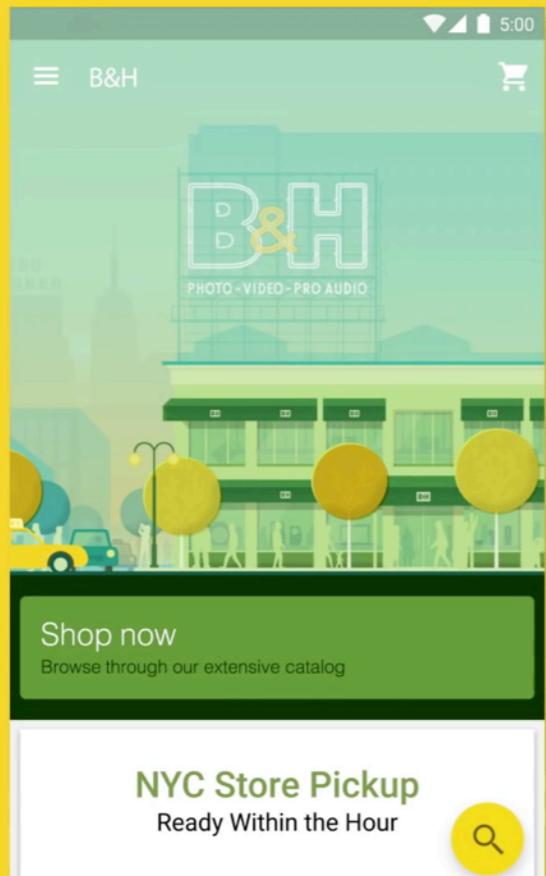
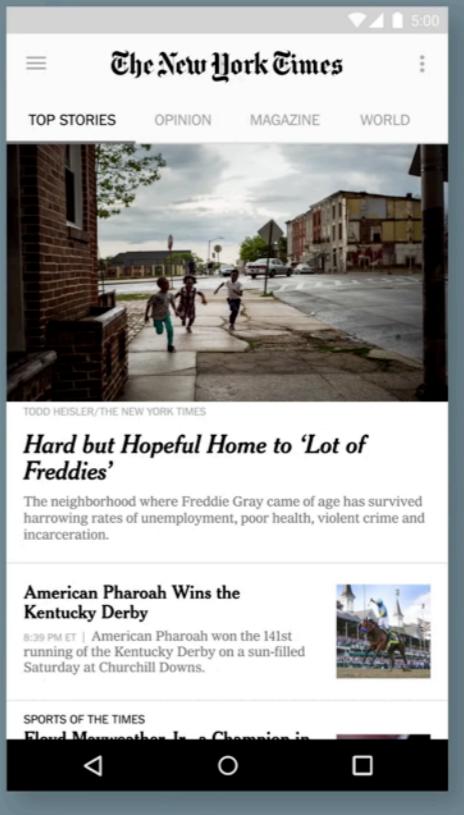
Adaptive Layouts

Pocket



Crafted Simplicity
Weather Time

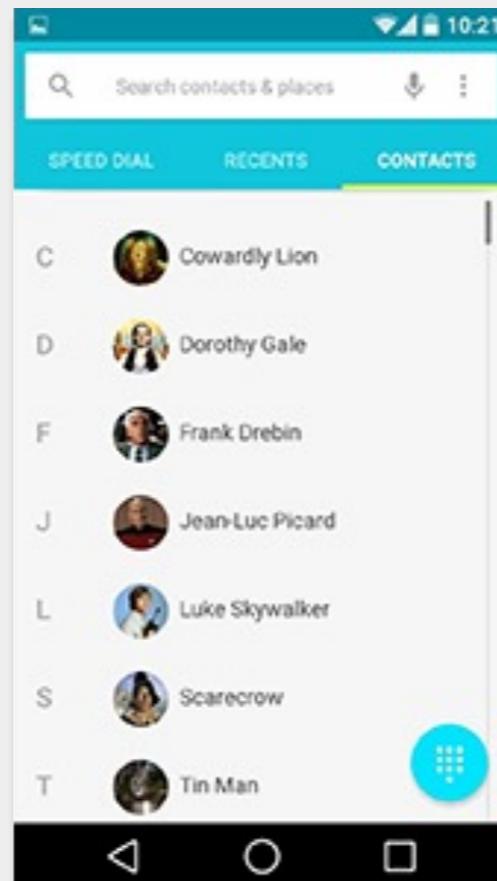
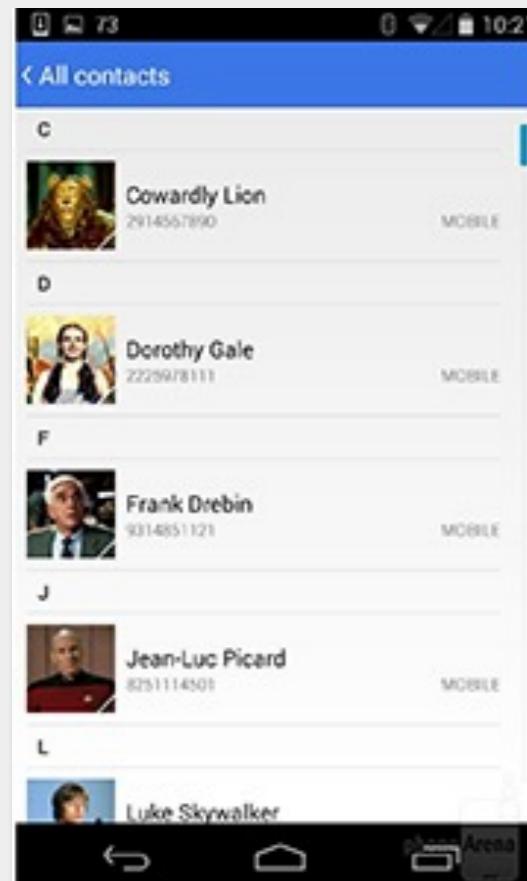
Elegant Typography New York Times



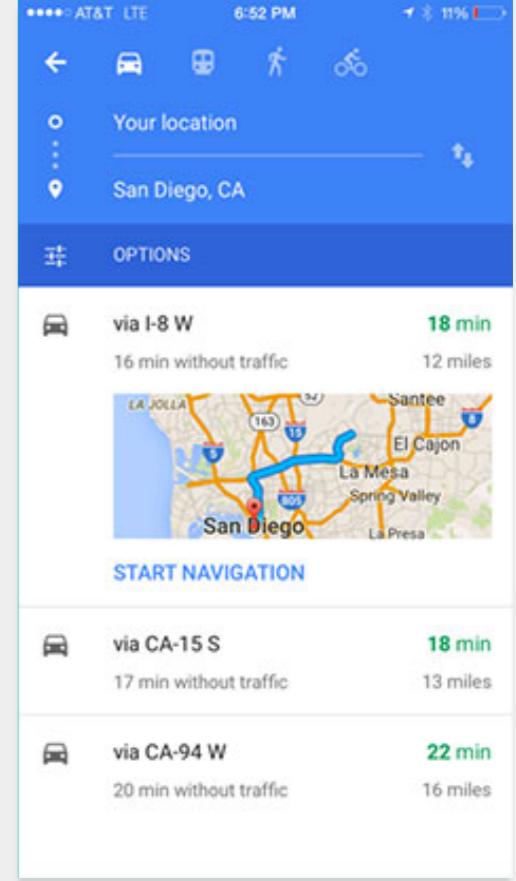
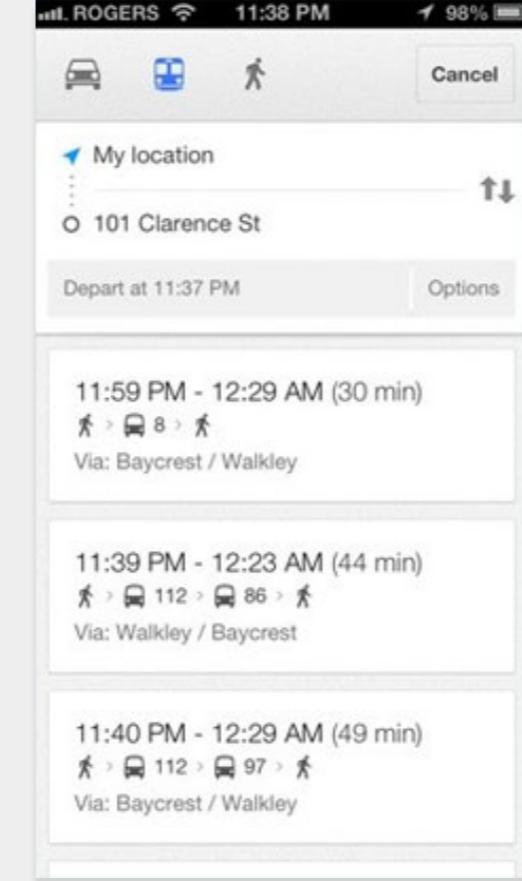
Immersive Imagery
B&H Photo Video

Case Studies Google Apps

Contacts



Google Maps





The Android Developer Conference

Please take a moment to fill out the class feedback form via the app.

Paper feedback forms are also available in the back of the room

eventmobi.com/adcboston

Building the Universal Design Language



Universal Design Language

Seamless Experiences

Concept Videos

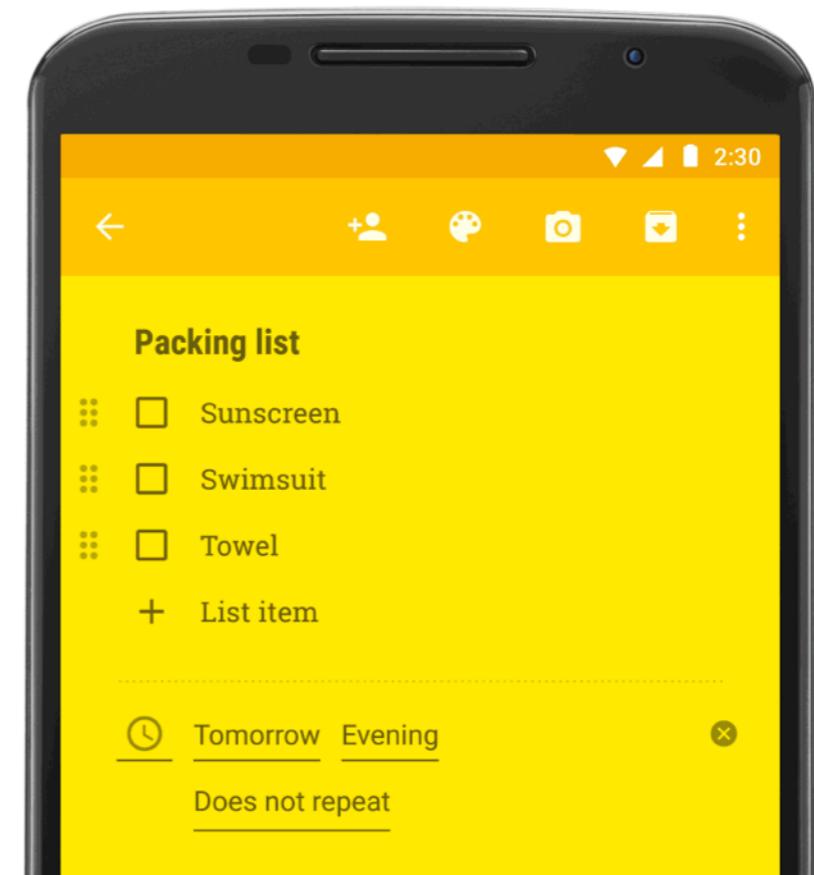
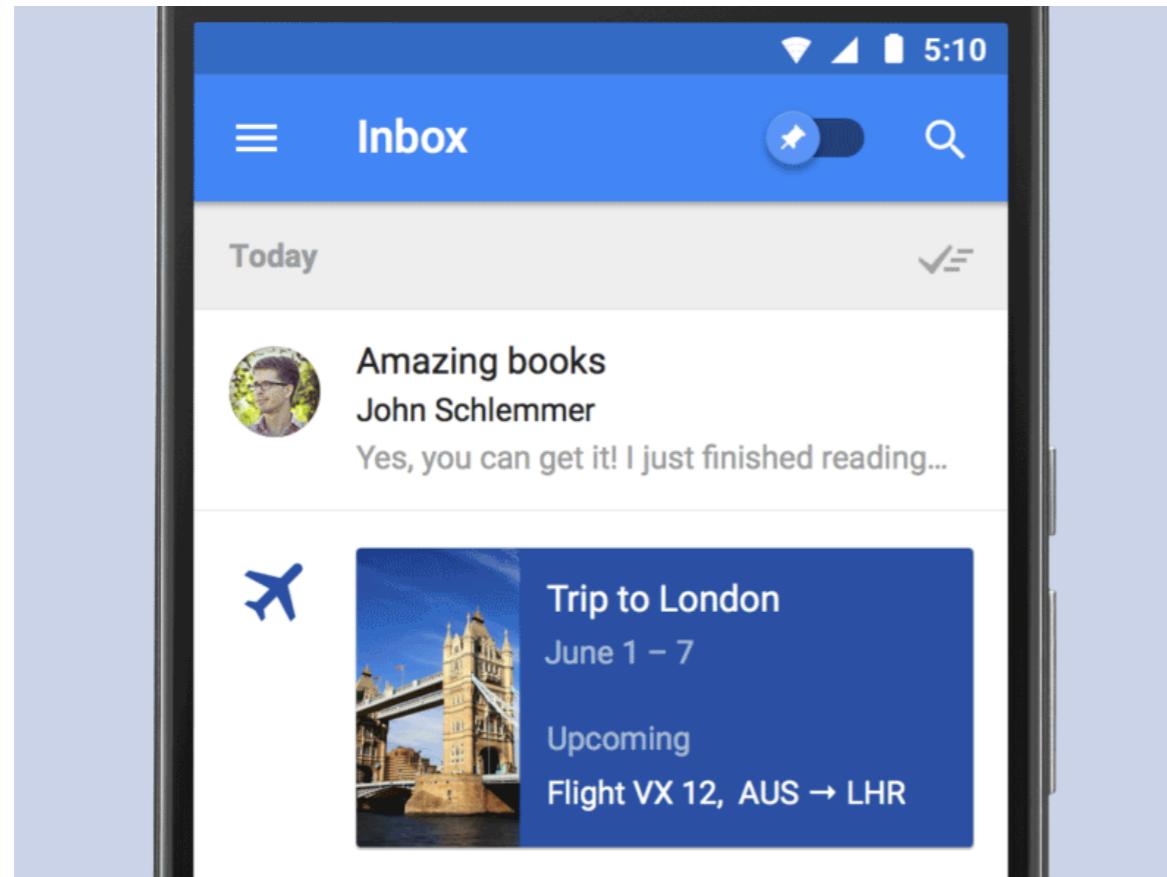
Microsoft future vision 2020



<https://www.youtube.com/watch?v=ozLaklFWUI>

Universal Design Language

Seamless Experiences



Universal Design Language

Seamless Experiences

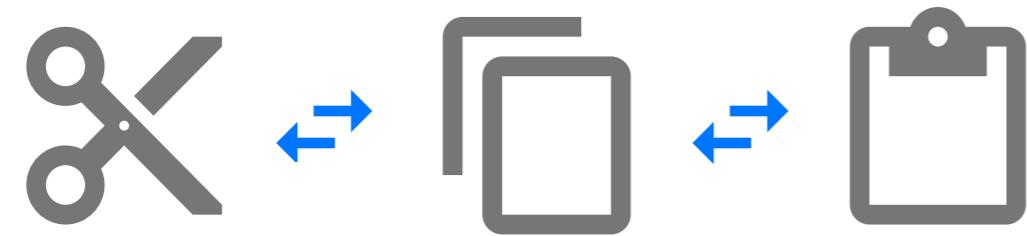
"One of the places that's a really open frontier, is how we get all of our more simple, more intuitive, more focused tools to work better together, to work in concert and to do things with them together in seamless ways that they couldn't do just by themselves.

I think that's actually a much more natural way to build complexity. "

Matias Duarte
VP of Design at Google
FROM Conference 2014

Universal Design Language

Seamless Experiences



Except for a few very coarse interchanges

Apps are usually very isolated

Universal Design Language

Seamless Experiences

In the real world, with the tools we build and with everything around us, that doesn't happen.

When you combine tools they become larger than the sum of their parts.



Universal Design Language Seamless Experiences



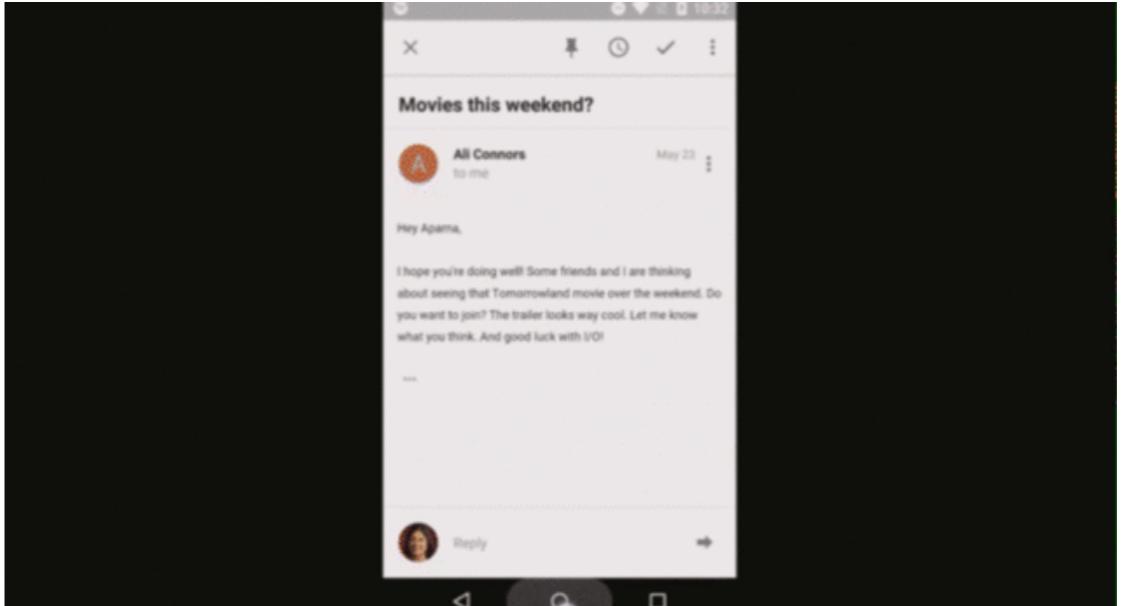
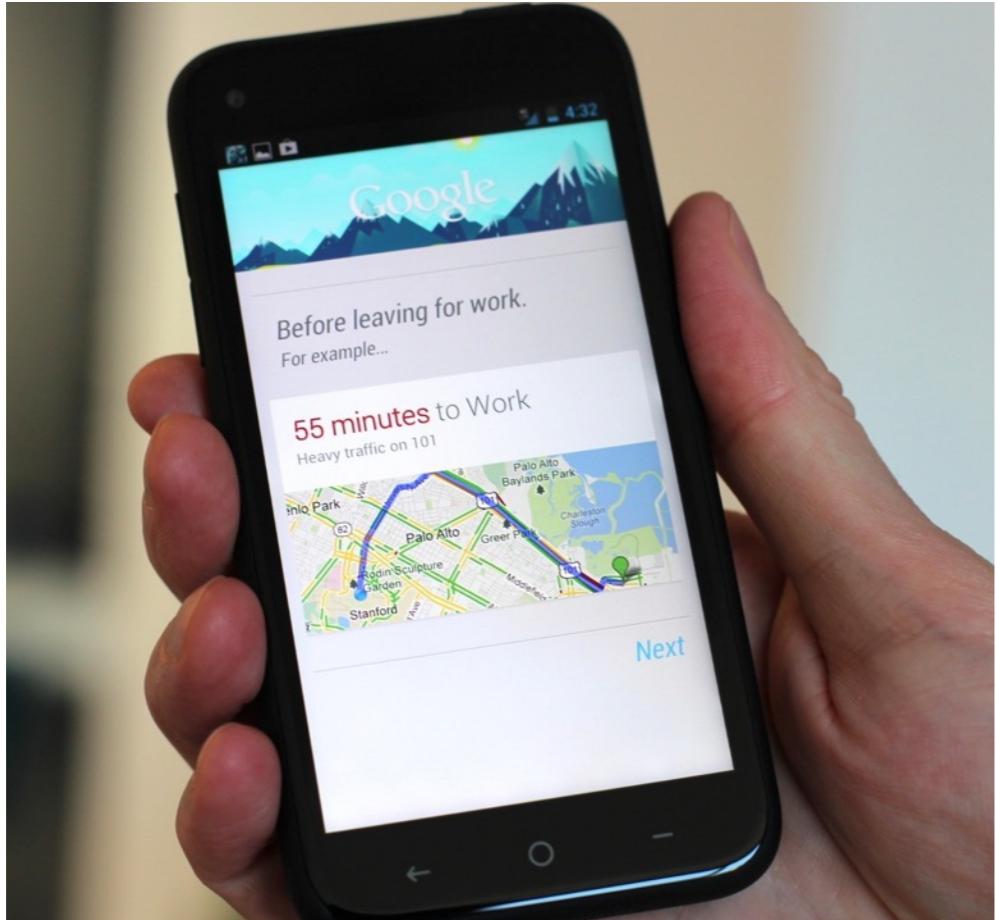
Concept
Videos

Apple Knowledge
Navigator
(1987)



<https://www.youtube.com/watch?v=JIE8xk6RI1w>

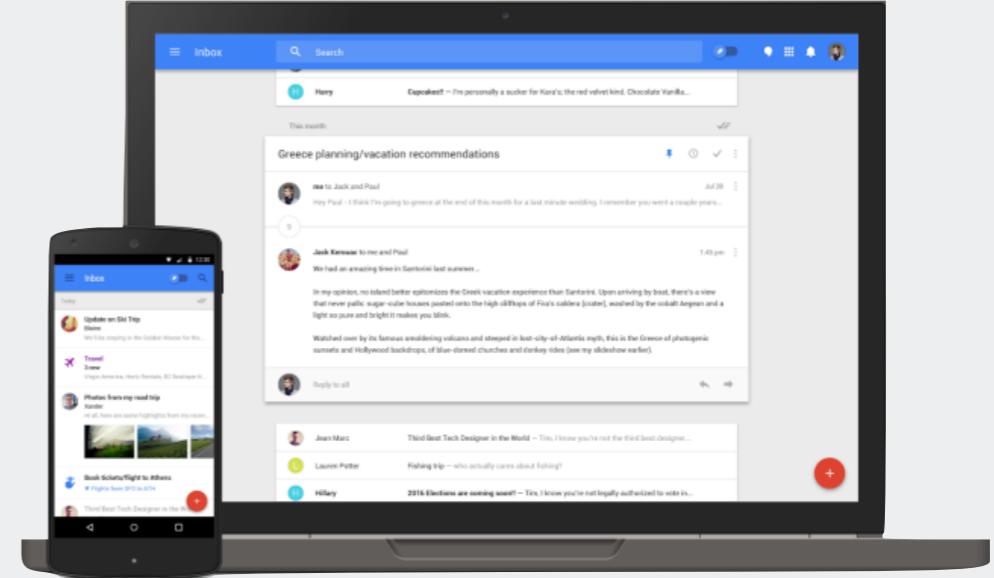
Universal Design Language Seamless Experiences



Google Now
Now on Tap

Universal Design Language

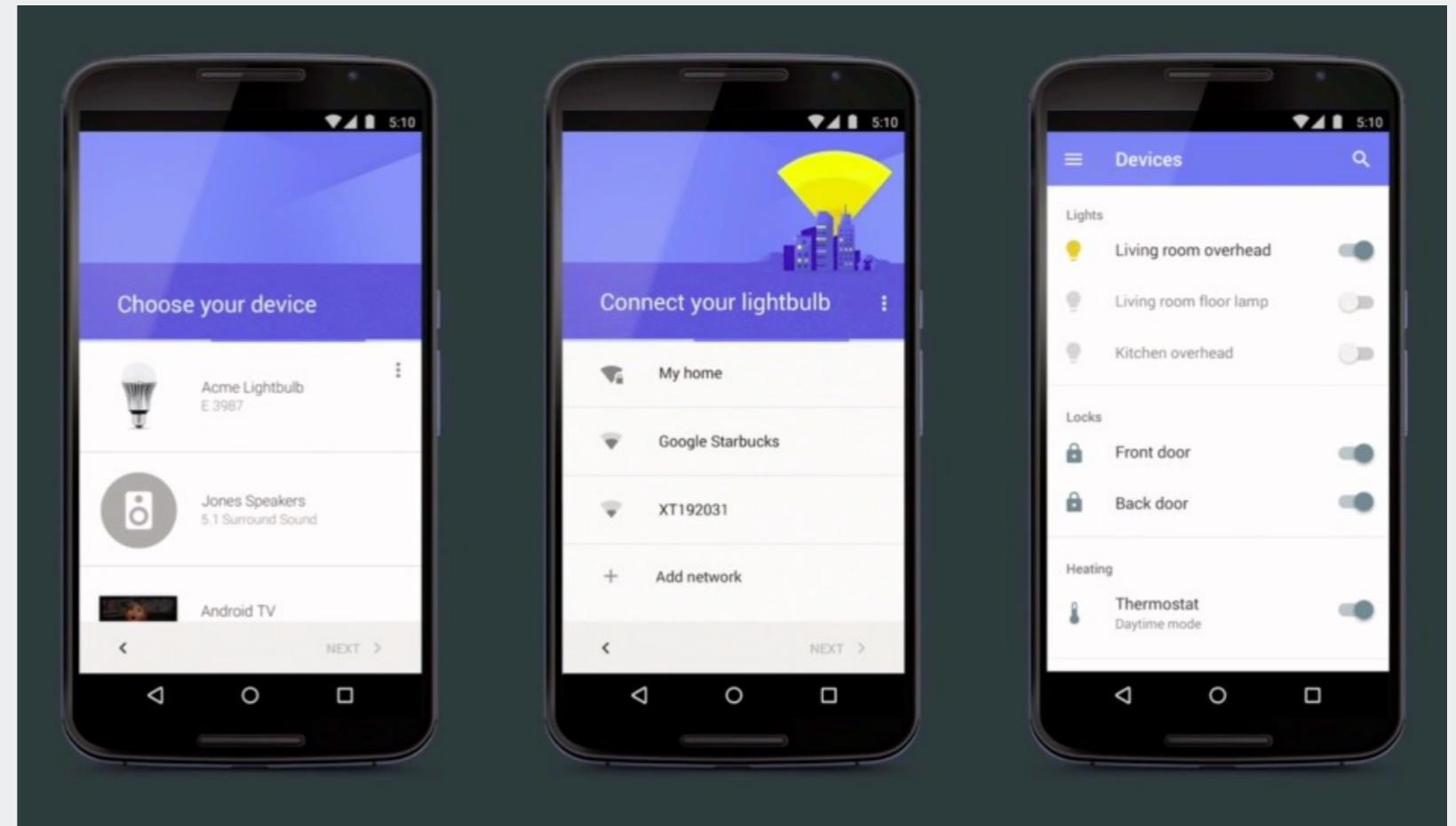
Material Everywhere



Universal Design Language Material Everywhere

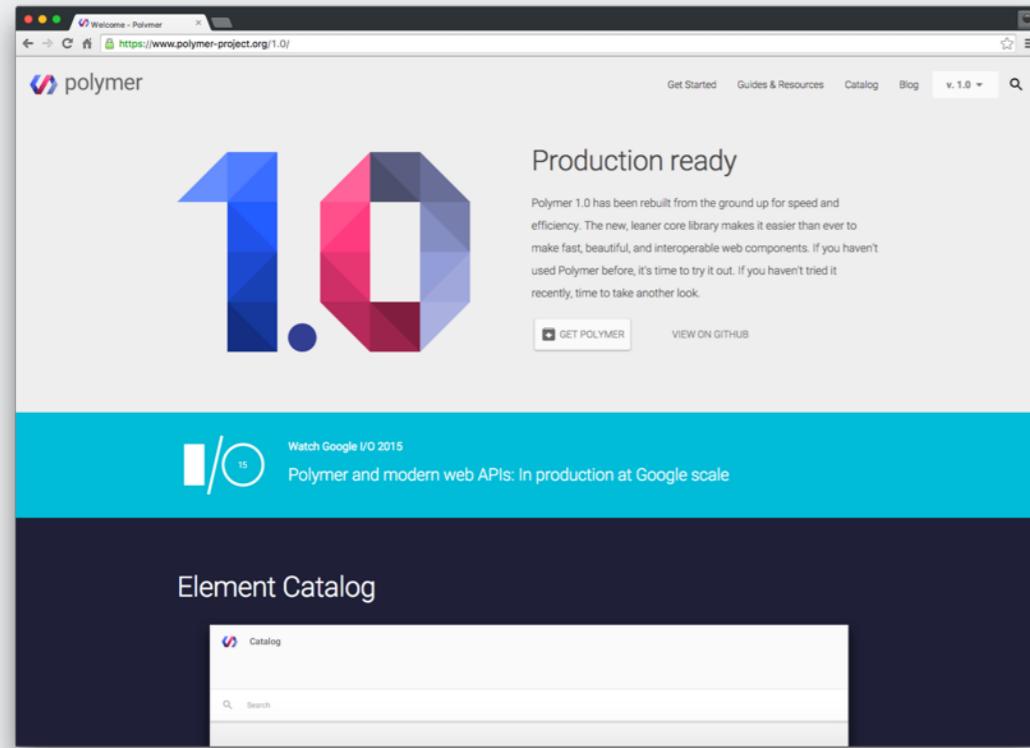
Internet
Of
Things

Project Brillo

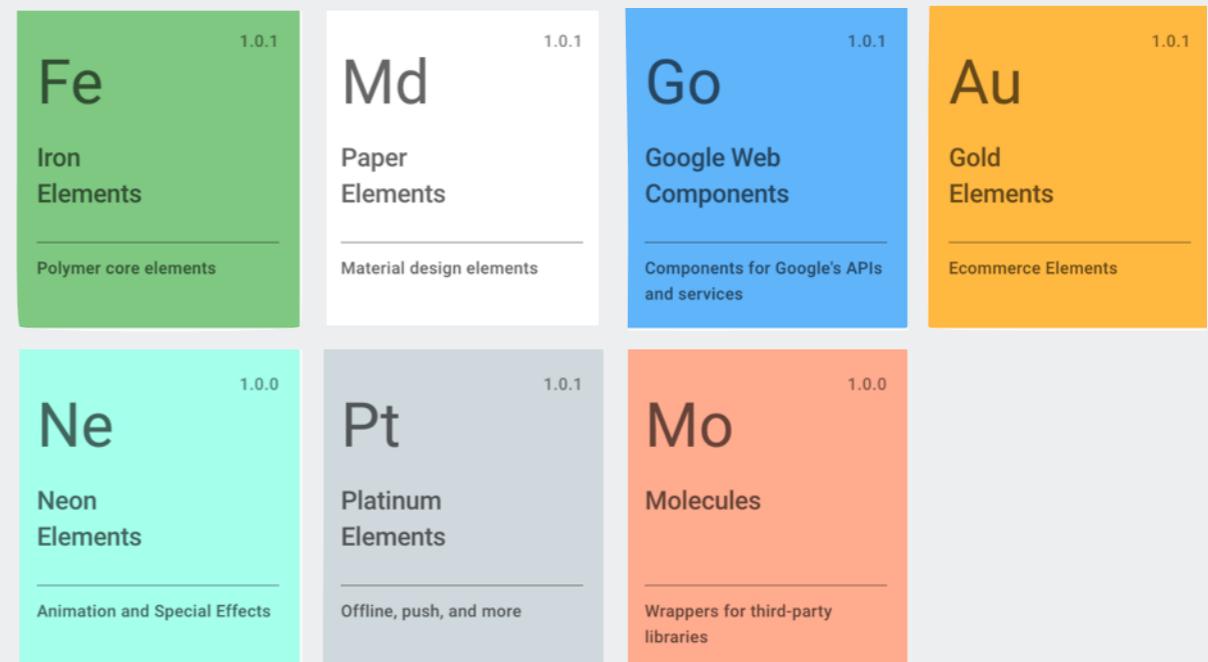


Universal Design Language

Material Everywhere



<https://www.polymer-project.org/>



Universal Design Language Material Everywhere



Material Design Lite

<http://www.getmdl.io/>

The image displays two side-by-side screenshots of the Material Design Lite website. The left screenshot shows the 'Components' section, featuring a sidebar with colored icons for various UI elements: Badges (orange), Buttons (red), Cards (teal), Layout (blue), Loading (purple), Menus (pink), Sliders (dark grey), Toggles (cyan), Tables (green), and Tooltips (light red). To the right of the sidebar, there's a brief description of what Material Design Lite is and some sample components. The right screenshot shows the 'TEMPLATES' section, which includes a 'Blog' template featuring a photo of a person at sunset and a 'BLOG' section, and an 'ANDROID.COM MDL SKIN' template showing a mobile version of the Android website.



Badges



Buttons



Cards



Layout



Loading



Menus



Sliders



Toggles



Tables



Text Fields



Tooltips

Universal Design Language

Be Together, Not The Same

android

be together. not the same.



Universal Design Language

Be Together, Not The Same

android

be together. not the same.

Your products should
come together, by using the
Material Design principles

But they should **not be**
the same, each one
has their own voice



Thank you!



Guilherme Schmitt

 @guischmitt

 guilherme@intrepid.io

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 @Intpd

 <http://intrepid.io/>