Mobile Programing

Chapter 5.2. Material Design

Note

❖ This slide is based on Google Android code labs slides

❖ Original slides:
https://drive.google.com/drive/folders/1eu-LXxiHocSktGYpG04PfE9Xmr_pBY5P
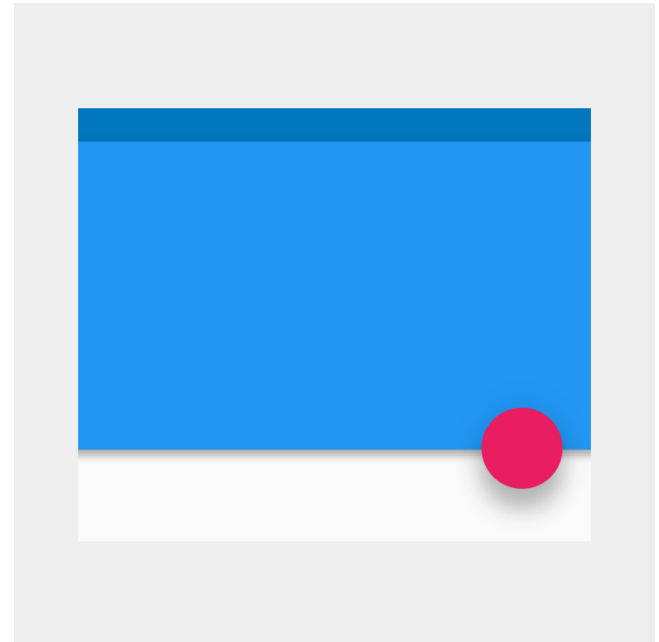
5.2 Material Design

Contents

- The Material Metaphor

- Imagery

- Typography

- Color

- Motion

- Layout

- Components

The Material Metaphor

What is Material Design?

- Design guidelines

- Visual language

- Combine classic principles of good design with innovation and possibilities of technology and science

- [Material Design Spec](#)

Material metaphor

- Three-dimensional environment containing light, material, and shadows

- Surfaces and edges provide visual cues grounded in reality

- Fundamentals of light, surface, and movement convey how objects move, interact, and exist in space and in relation to each other

# Material design in your app

Elements in your Android app should behave similarly to real world materials

- Cast shadows

- Occupy space

- Interact with each other

Bold, graphic, intentional

- Choose colors deliberately

- Fill screen edge to edge

- Use large-scale typography

- Use white space intentionally

- Emphasize user action

- Make functionality obvious

Imagery

Material Design
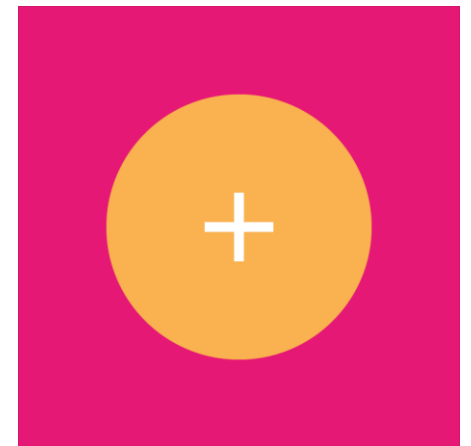
Imagery

Images help you communicate and differentiate your app

Should be
- Relevant
- Informative
- Delightful

Best practices
- Use together with text
- Original images
- Provide point of focus
- Build a narrative

Typography

Roboto typeface

Roboto is the standard typeface on Android

Roboto has 6 weights

- Thin
- Light
- Regular
- Medium
- Bold
- Black

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

Font styles and scale

- Too many sizes is confusing and looks bad
- Limited set of sizes that work well together

Display 4   Light 112sp

Display 3   Regular 56sp

Display 2   Regular 45sp

Display 1   Regular 34sp

Regular 24sp

Headline   Medium 20sp

Title   Regular 16sp (Device), Regular 15sp (Desktop)

Subheading   Medium 14sp (Device), Medium 13sp (Desktop)

Regular 14sp (Device), Regular 13sp (Desktop)

Caption   Regular 12sp

Body 2

Button   MEDIUM (ALL CAPS) 14sp

Body 1

Caption

Button

Setting text appearance

```
android:textAppearance=
    "@style/TextAppearance.AppCompat.Display3"
```

Fonts as resources

- Bundle fonts as resources in app package (APK)
- Create `font` folder within `res`, add font XML file to `font`
- To access font resource:
    - `@font/myfont`
    - `R.font.myfont`
- Android 8.0 (API level 26) — Android 4.1 (API level 16) and higher, use the Support Library 26
- See [Fonts in XML](#)

Downloadable fonts

- Download fonts from provider app
  - Reduces APK size
  - Increases the app installation success rate
  - Improves the overall system health, saves cellular data, phone memory, and disk space
- Android 8.0 (API level 26) — API level 14 and higher, use Support Library 26
- See Downloadable Fonts

Color
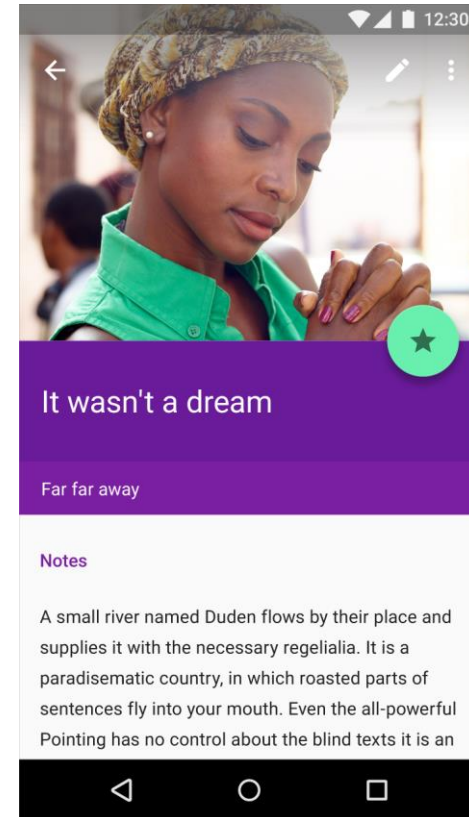
Color

- Bold hues

- Muted environments

- Deep shadows

- Bright highlights
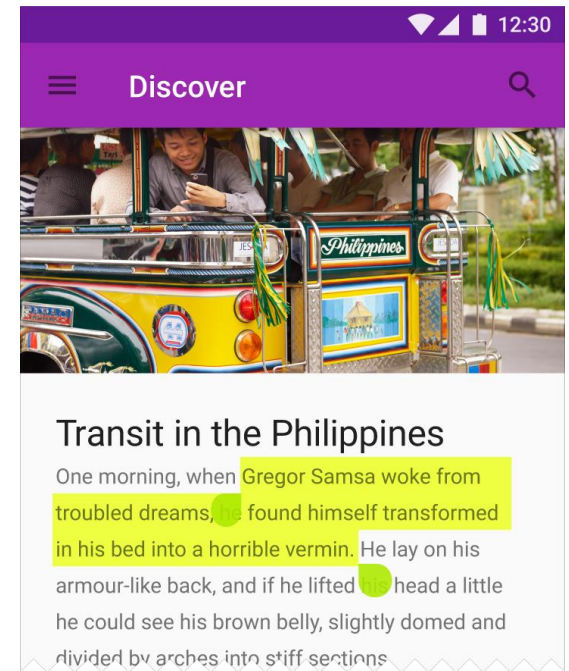
Color palette

Material Design recommends using

- a primary color
- along with some shades
- and an accent color

Create a bold user experience for your app

- [Material Design Color Palette](#)

Color palette for your project

- Android Studio creates a color palette for you

- AppTheme definition in styles.xml
  - colorPrimary—AppBar, branding
  - colorPrimaryDark—status bar, contrast
  - colorAccent—draw user attention, switches, FAB

- Colors defined in colors.xml

- Color selection tool

Primary — Purple	
500	#9B26AF
700	#7A1EA1
800	#691A99

Accent — Green	
A200	#68EFAD

Text color and contrast

- Contrast for visual separation

- Contrast for readability

- Contrast for accessibility

- Not all people see colors the same

- Theme handles text by default
  - Theme.AppCompat.Light—text will be near black
  - Theme.AppCompat.Light.DarkActionBar— text near white

Good choice
Good choice
Bad choice
Bad choice
Bad choice
Good choice

Motion
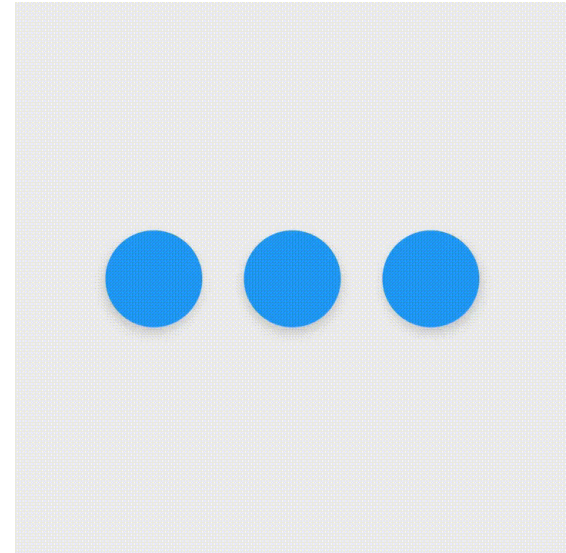
Motion

Motion in Material Design describes

- Spatial relationships
- Functionality
- Intention

Motion is

- Responsive
- Natural
- Aware
- Intentional

Motion in your app

- Maintain continuity
- Highlight elements or actions
- Transition naturally between actions or states
- Draw focus
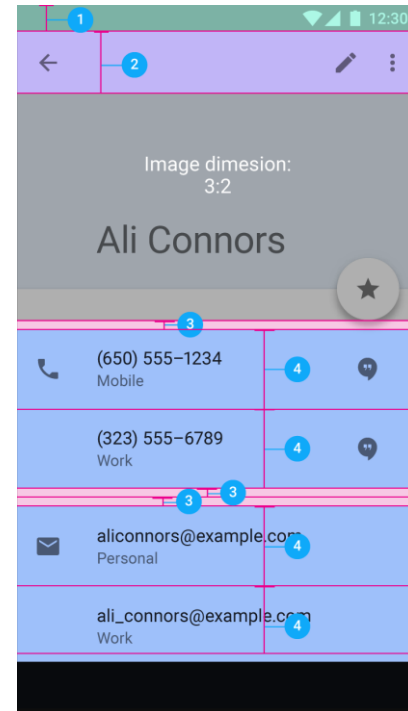- Organize transitions
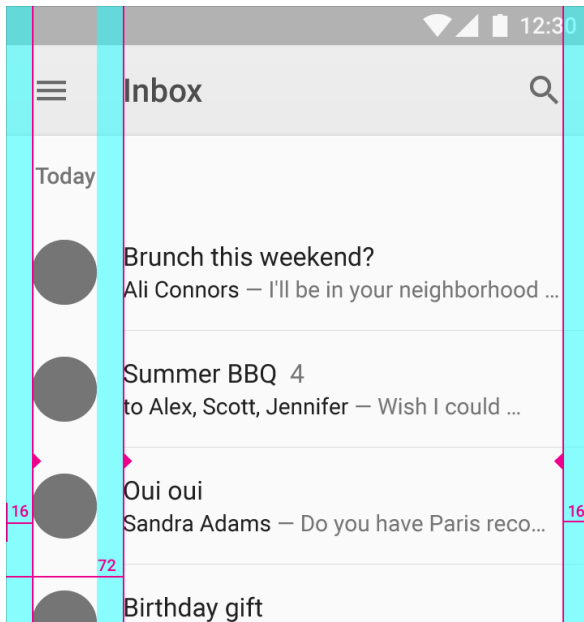- Responsive feedback
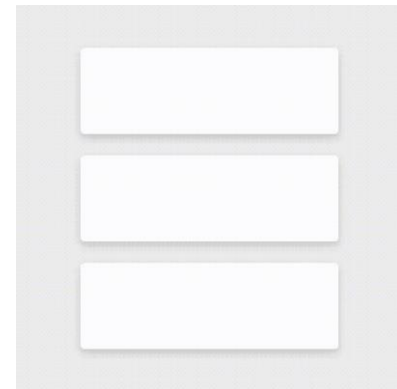
Touch feedback
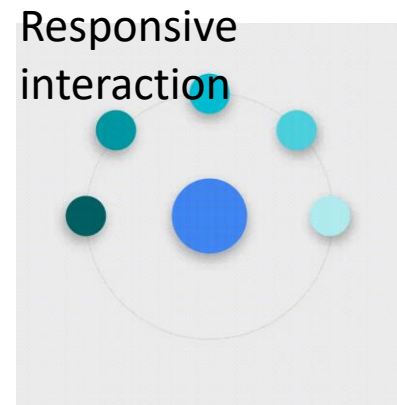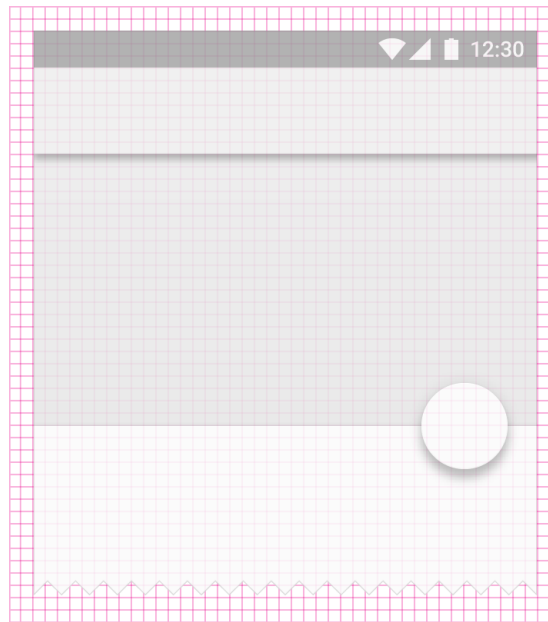
Responsive interaction

Layout

Layout for Material Design

- Density independent pixels for views—dp

- Scalable pixels for text—sp

- Elements align to a [grid with consistent spacing](#)

- Plan your layout
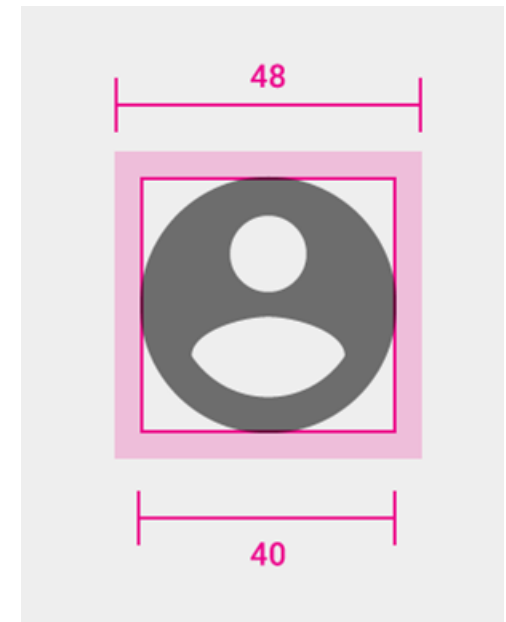
- Use [templates](#) for common layout patterns

VIỆN CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG
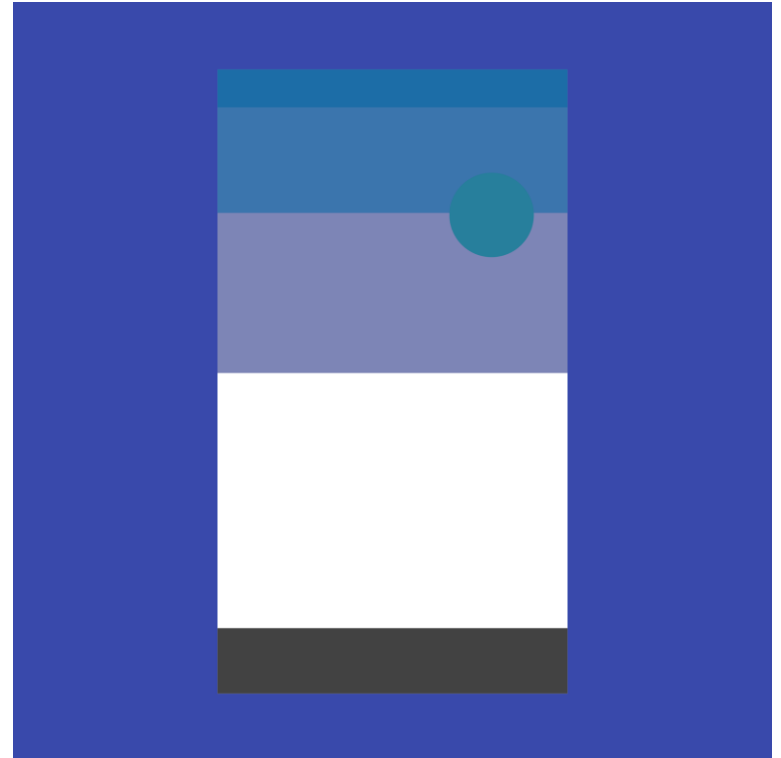
Layout planning

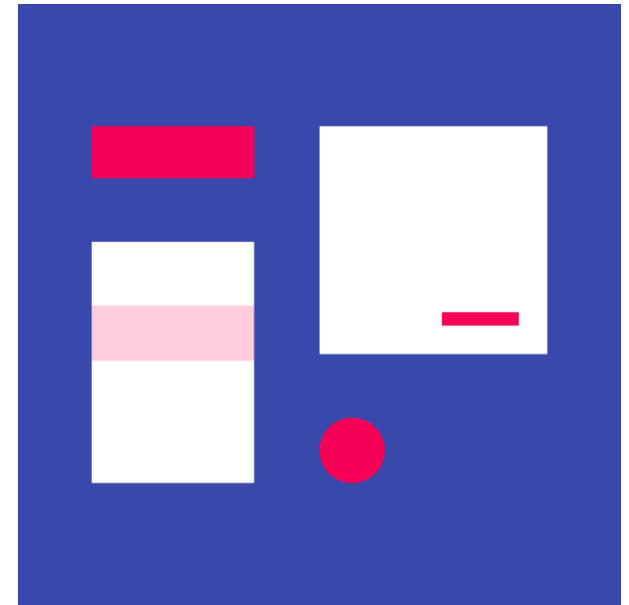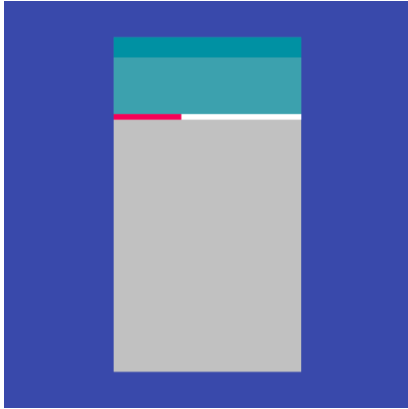

Spacing

Grid alignment

Sizing

Components

Components

Material Design has guidelines on the use and implementation of Android components

- Bottom Navigation
- Buttons
- Cards
- Chips
- Data Tables
- Dialogs
- Dividers

- Sliders
- Snackbar
- Toasts
- Steppers
- Subheaders
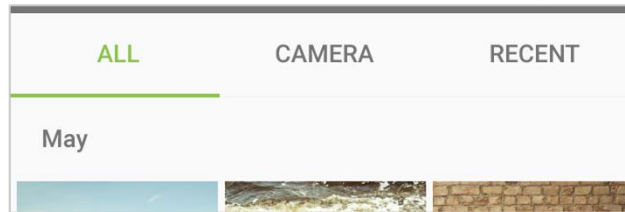- Text Fields
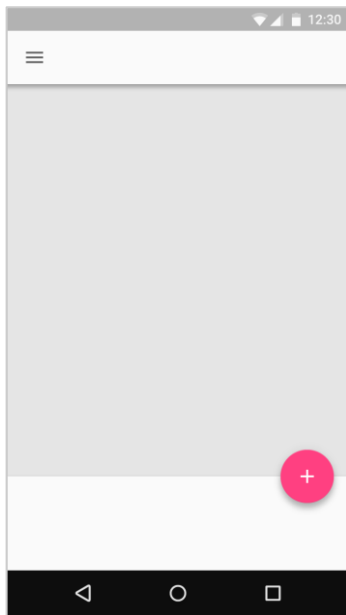- Toolbars

More components

- Expansion Panels
- Grid Lists
- Lists
- Menus
- Pickers
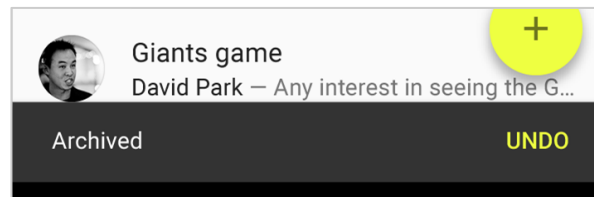- Progress Bars
- Selection Controls

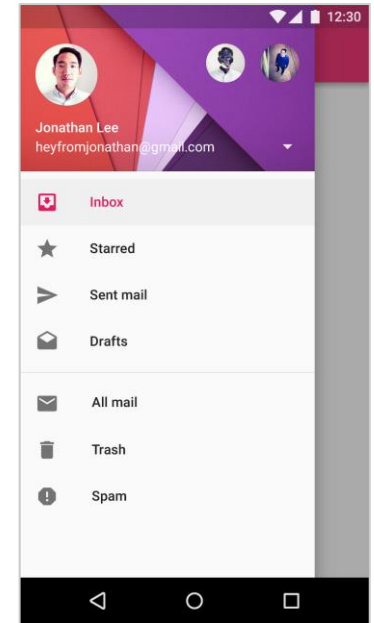# Consistency helps user intuition

FAB

Tabs

Snackbar

Navigation Drawer

Learn more

- [Material Design Guidelines](#)
- [Material Design Guide](#)
- [Material Design for Android](#)
- [Material Design for Developers](#)
- [Material Palette Generator](#)

- [Cards and Lists Guide](#)
- [Floating Action Button Reference](#)
- [Defining Custom Animations](#)
- [View Animation](#)

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What's Next?

- Concept Chapter: [5.2 Material Design](#)

- Practical: [5.2 Cards, and colors](#)

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END

**Material
Design**