

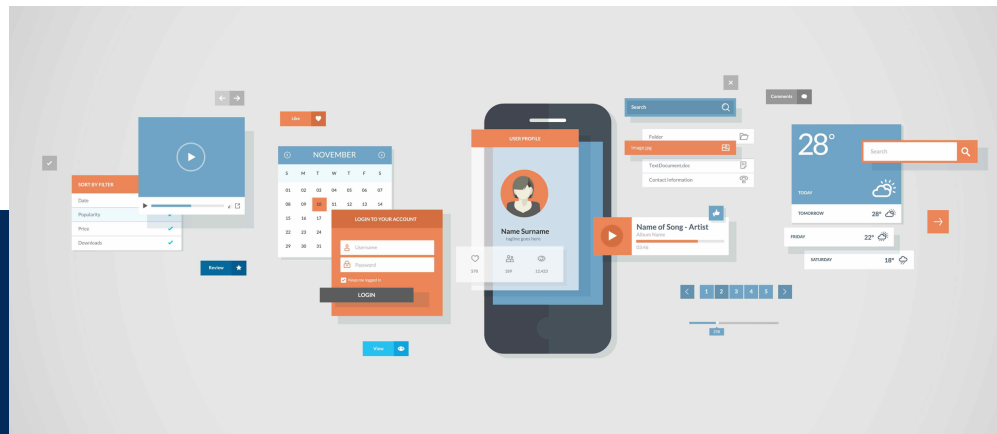
# Mobile Applications

## CSCI 448

### Lecture 12



## Material Design



# Previously in CSCI 448



- Tasks keep back stack of Activity pointers
- Each Activity lives in a single Process
- Task could span multiple Processes

# Questions?



??

# Learning Outcomes For Today



- Create an app that looks like a modern Android app using Material Design

# On Tap For Today



- Material Design

# On Tap For Today



- Material Design

# UI Design Concept / Metaphor



- Design system to provide consistent meaningful experience across all apps

- Responsive design
  - Mobile
  - Tablet
  - Desktop

<https://m3.material.io/>

<http://studio.uxpin.com/ebooks/ux-design-trends-responsive-adaptive-web-design/> Free eBook

- <http://m.somewebsite.com> - No More

# Three Principles



1. Material is the metaphor
2. Bold, graphic, and intentional
3. Motion provides meaning



# Three Principles



1. Material is the metaphor
2. Bold, graphic, and intentional
3. Motion provides meaning

# Material is the Metaphor



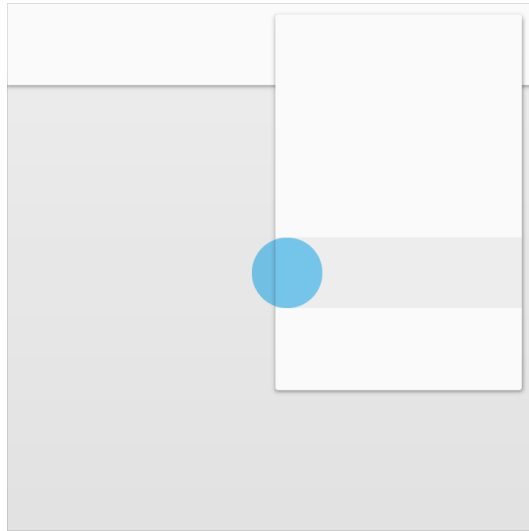
- Components should act like physical objects
- Our layout is done in 3D space
  - Every component is a 1dp thick sheet of paper
- Material can change size, shape, content
- Material is solid



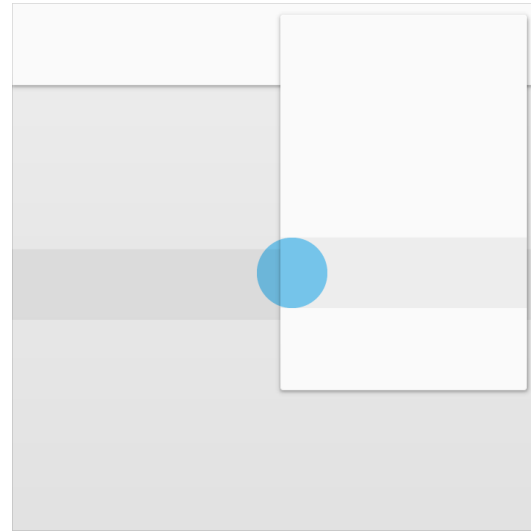
# 3D Space



- Solid material



**YES**

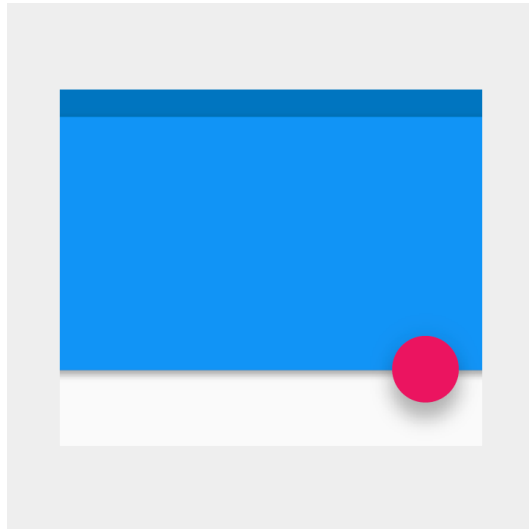


**NO**

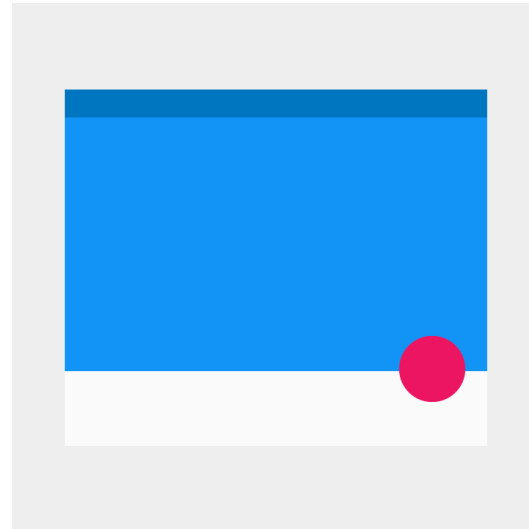
# 3D Space



- Solid material
- Casts shadows



**YES**

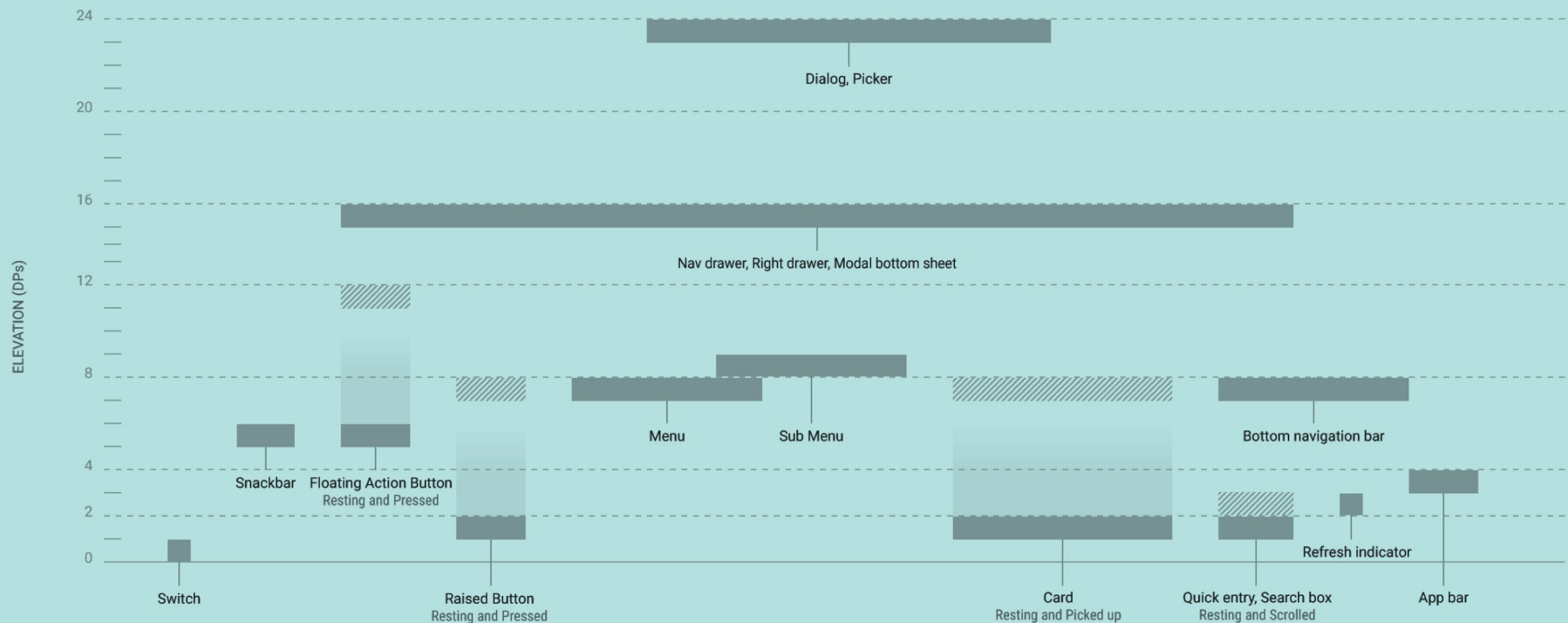


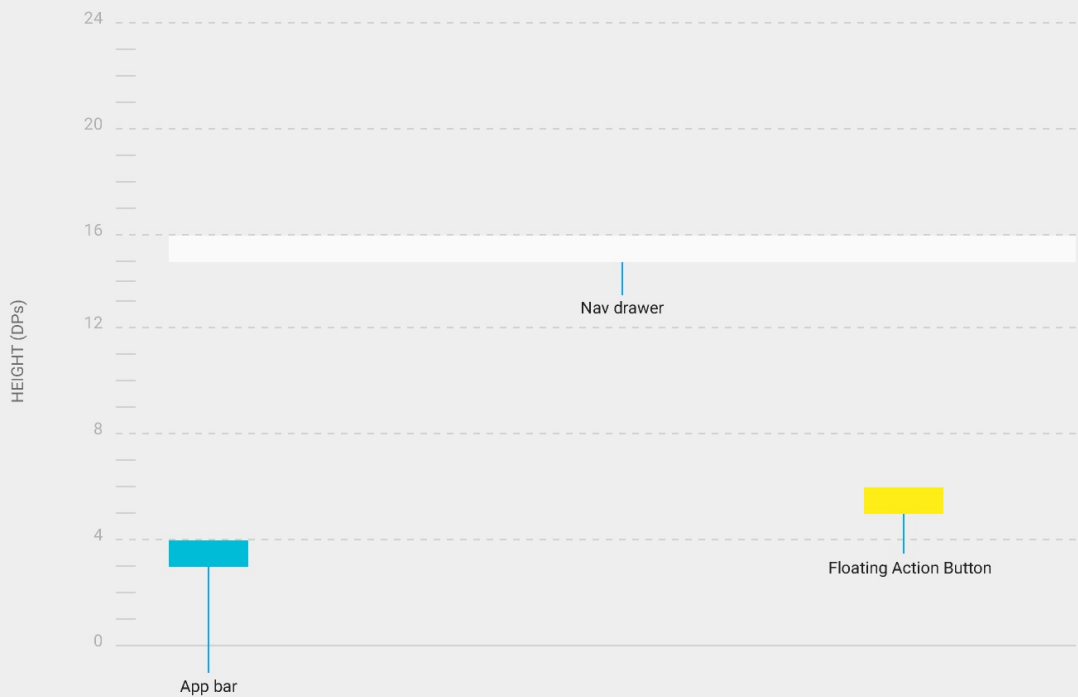
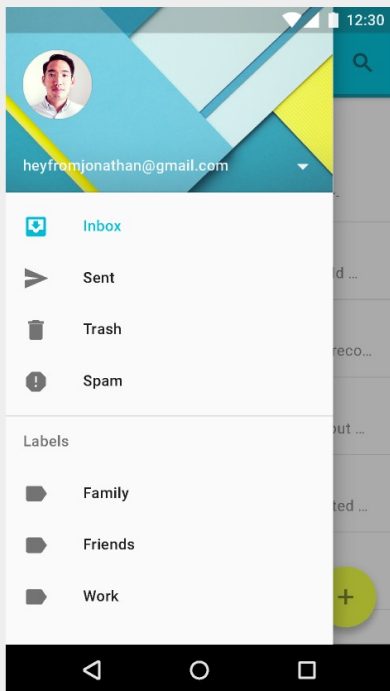
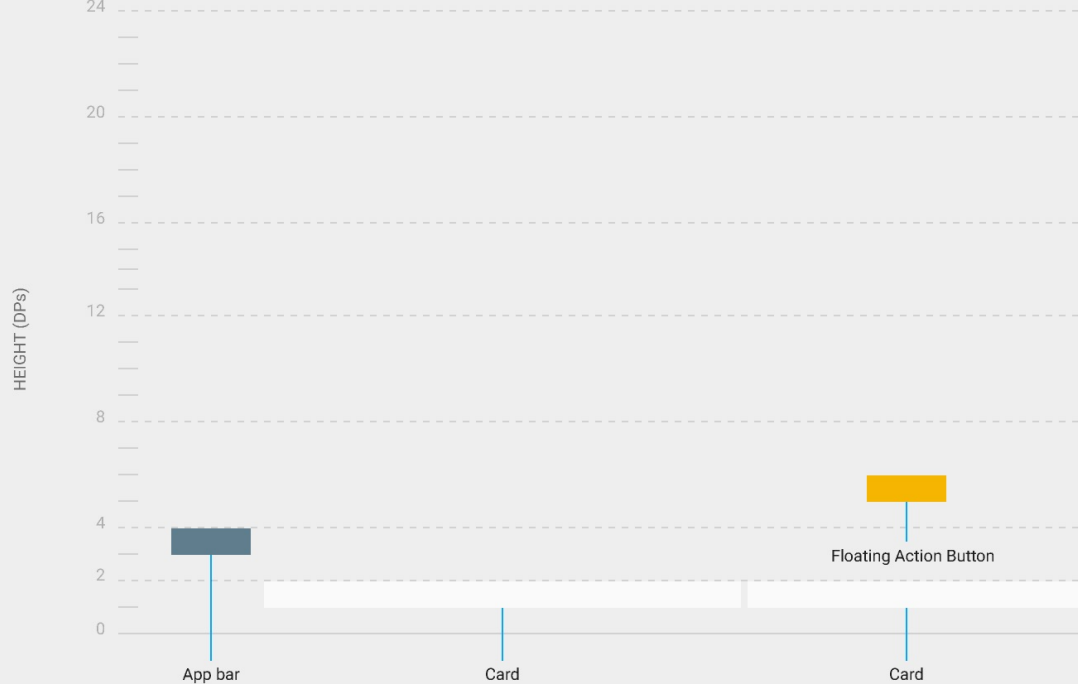
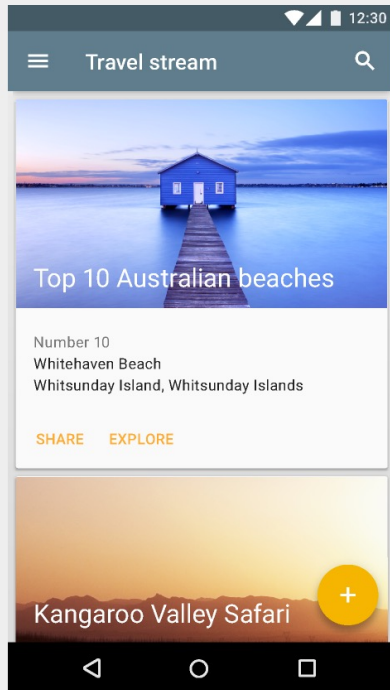
**NO**

# 3D Space



- Solid material
- Casts shadows
- Dynamic Elevations





# 3D Space



- Solid material
- Casts shadows
- Dynamic Elevations
- Rules

## Modal bottom sheet

16dp

## Menus and sub menus

Menus: 8dp

Sub menus: 9dp (+1 dp for each sub menu)

## Card

Resting state: 2dp

Raised state: 8dp

## App bar

4dp

## Dialogs

24dp

## Snackbar

6dp

## Raised button

Resting state: 2dp

Pressed state: 8dp

## Nav Drawer & Right drawer

16dp

## Floating action button (FAB)

Resting state: 6dp

Pressed state: 12dp

## Refresh indicator

3dp

## Switch

1dp

# Using 3D Space



- Set the elevation of your composable
- Shadows handled for you!

```
@Composable
fun ShadowButton() {
    Button(
        elevation = ButtonDefaults.buttonElevation(
            defaultElevation = 8.dp,
            pressedElevation = 2.dp,
            focusedElevation = 8.dp,
            disabledElevation = 0.dp
        )
    ) {
        ...
    }
}
```



# Quick Tangent



- South Park used Material Design before it was cool!



- Then they scanned everything and now do it in Maya (and have digitally for 25+ years\*)

# And now for something completely different



- But Monty Python did it first



# Three Principles

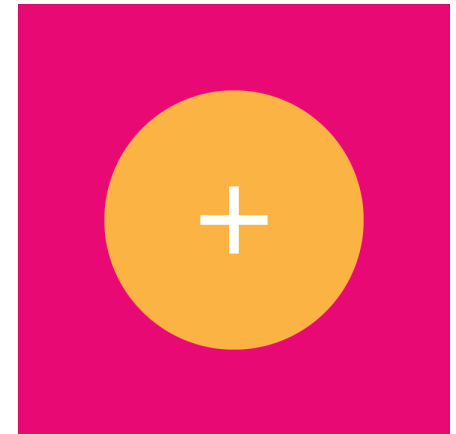


1. Material is the metaphor
2. Bold, graphic, and intentional
3. Motion provides meaning

# Bold, Graphic, Intentional



- Principles of graphic design
- Think like paper & ink
- Choose a color palette & scheme
  - Primary color
  - Secondary color
  - Tertiary color (accent)
- <https://m3.material.io/styles/color/the-color-system/key-colors-tones>



# Baseline Material Color Theme



Primary Key Color



Primary

Primary40

On Primary

Primary100

Primary Container

Primary90

On Primary Container

Primary10

Secondary Key Color



Secondary

Secondary40

On Secondary

Secondary100

Secondary Container

Secondary90

On Secondary Container

Secondary10

Tertiary Key Color



Tertiary

Tertiary40

On Tertiary

Tertiary100

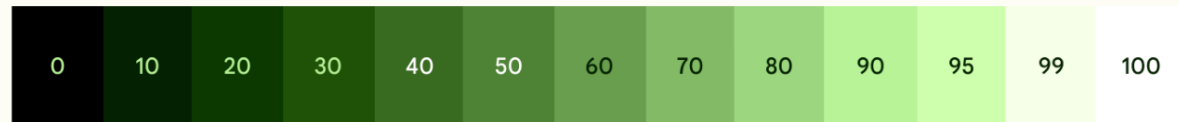
Tertiary Container

Tertiary90

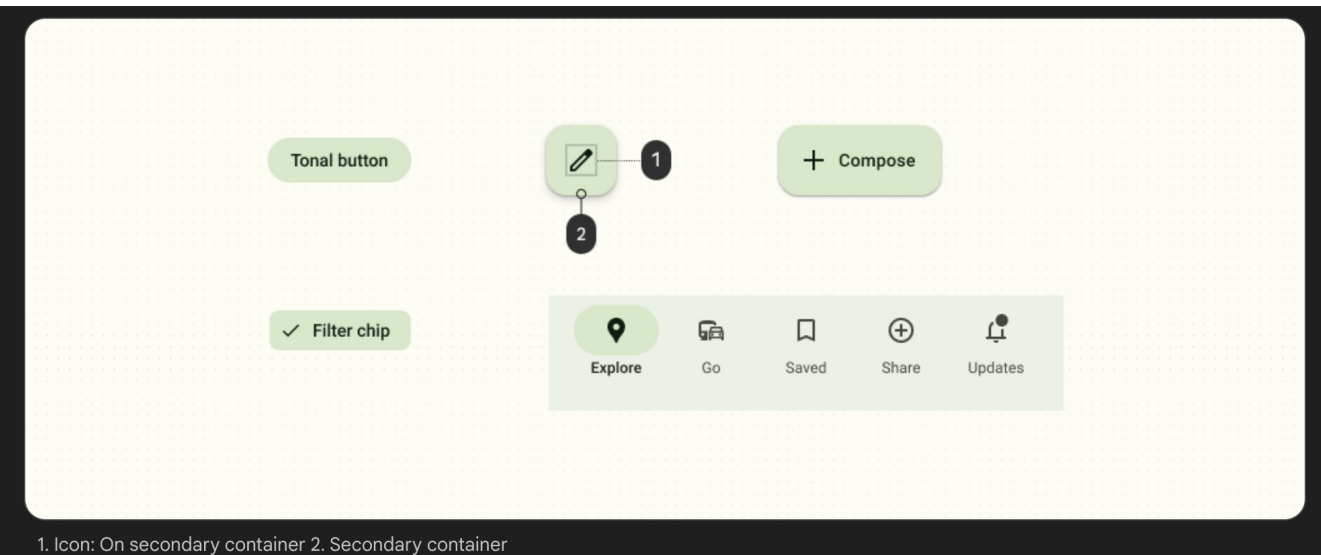
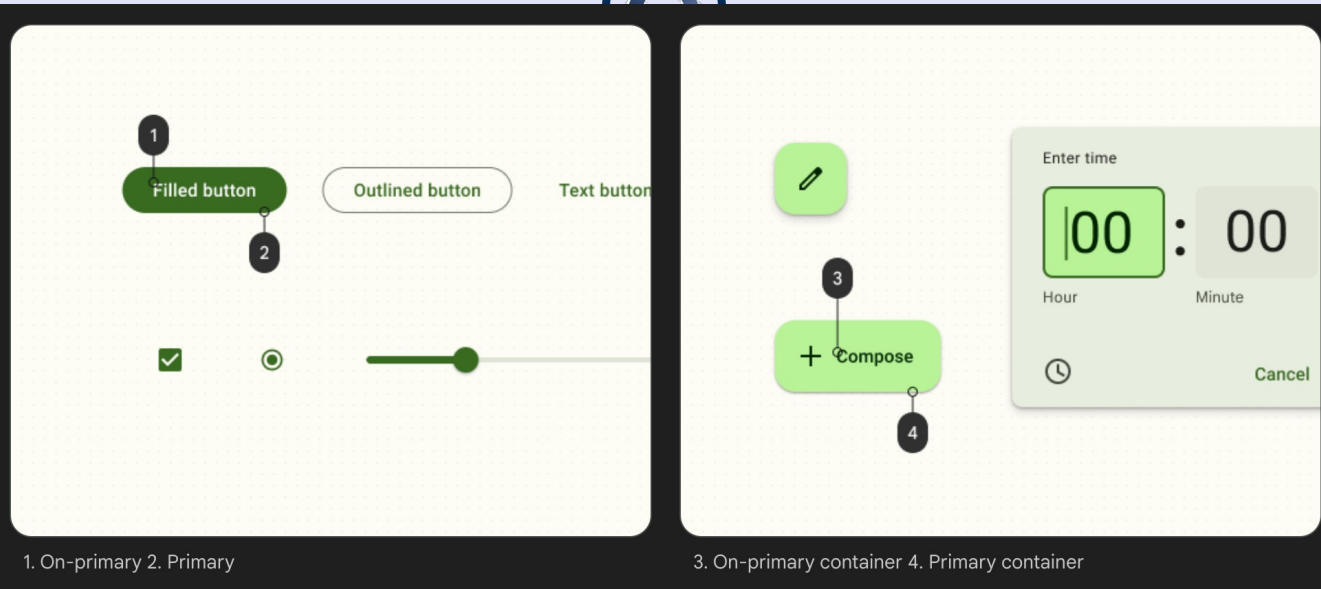
On Tertiary Container

Tertiary10

Primary Key Color



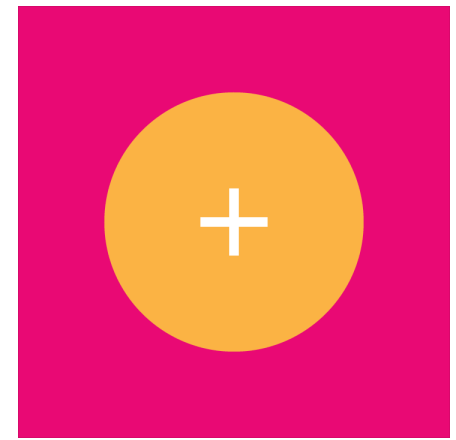
# Color Roles



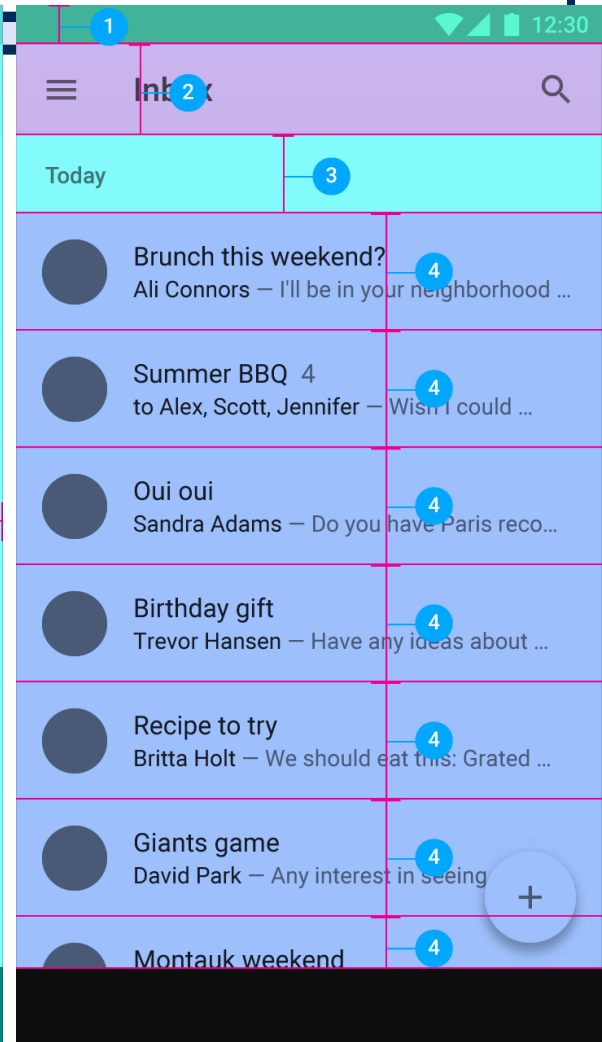
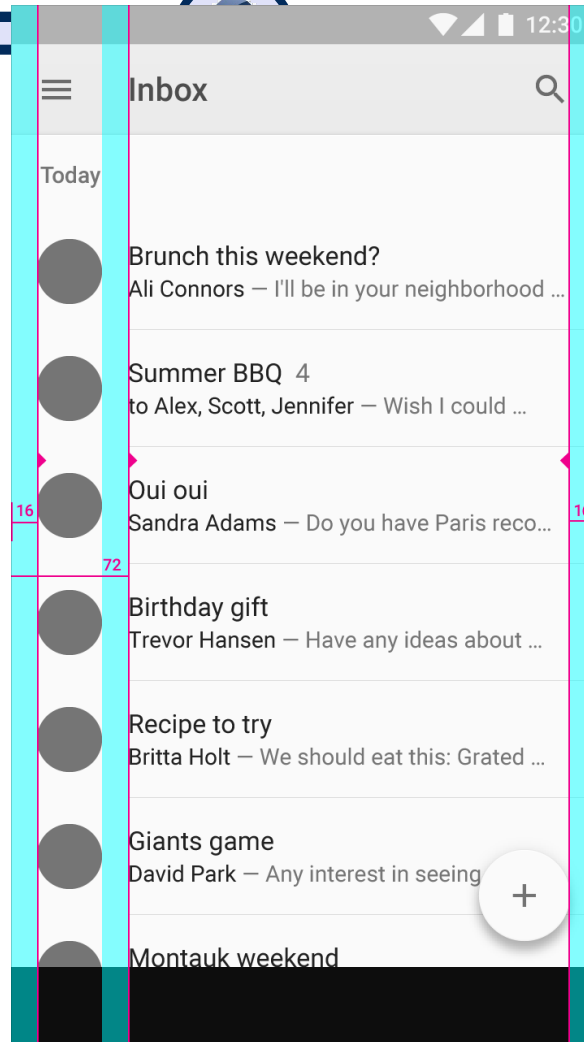
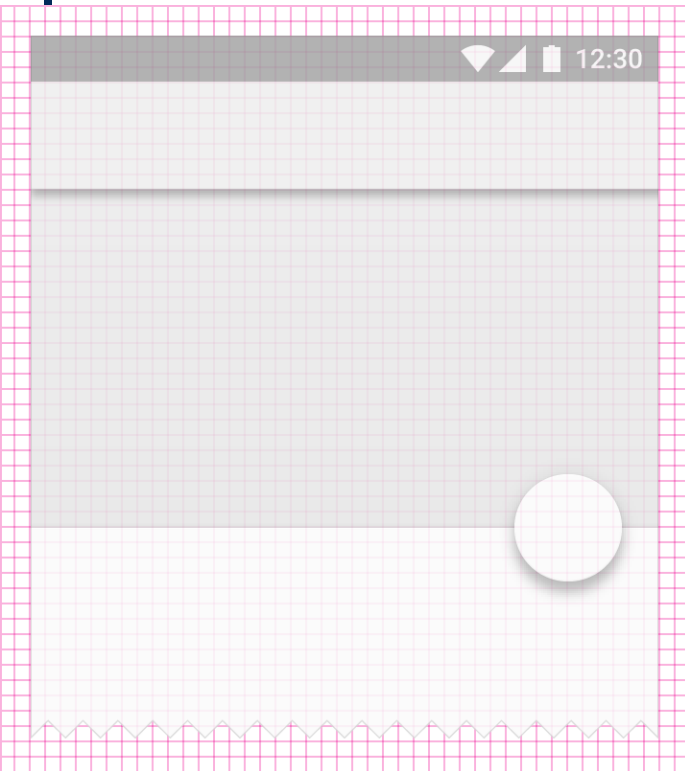
# Bold, Graphic, Intentional



- Principles of graphic design
- Think like paper & ink
- Choose a color palette & scheme
  - Primary color
  - Secondary color
  - Accent color
- Grid layout



# Grid Layout





# Three Principles

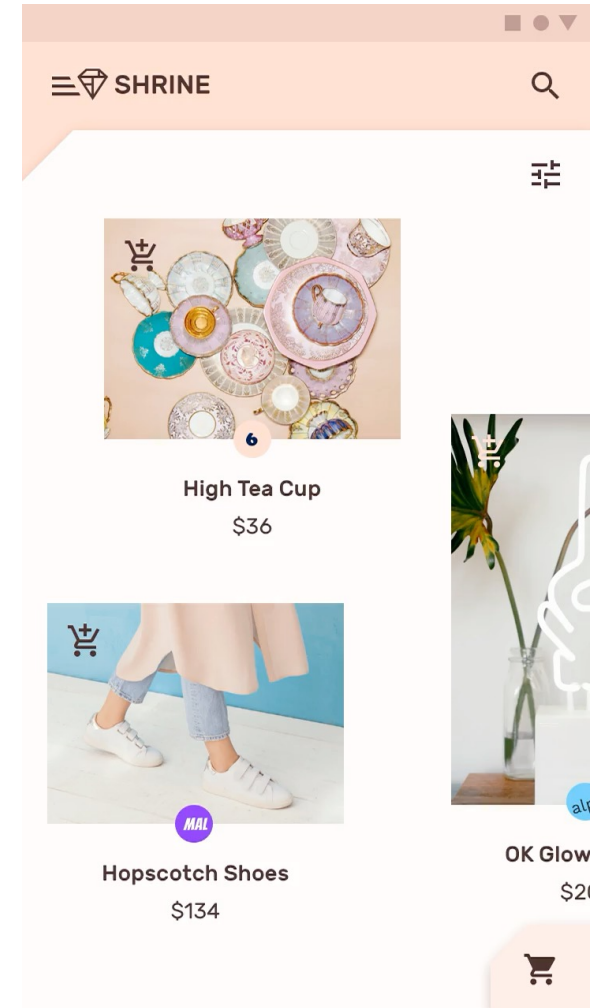


1. Material is the metaphor
2. Bold, graphic, and intentional
3. Motion provides meaning

# Motion Provides Meaning



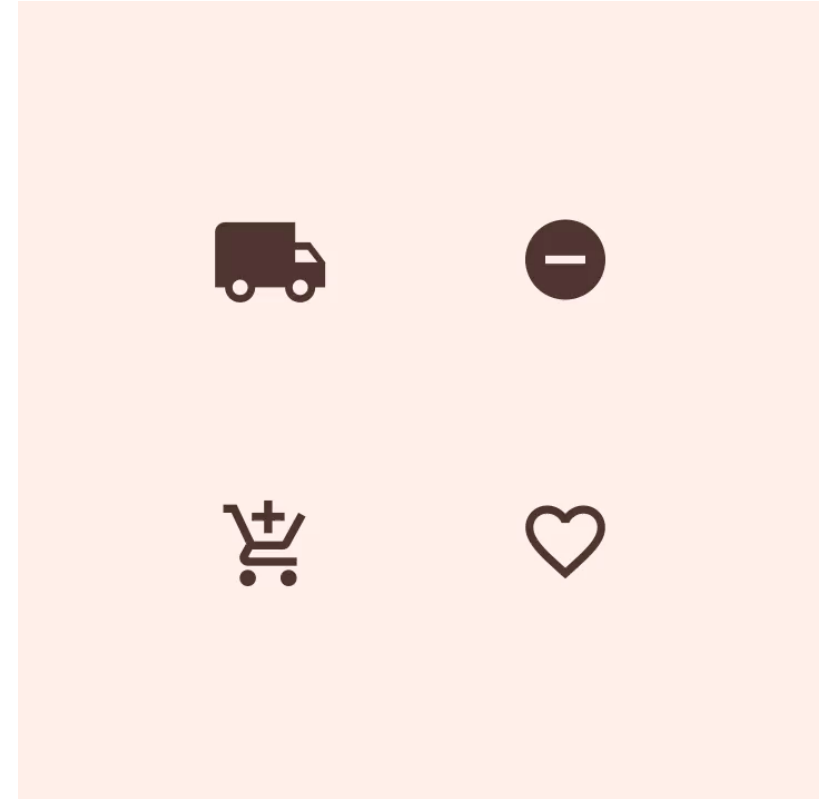
- How an object moves dictates
  - how heavy/light it is
  - Spatial relationships to other items



# Motion Provides Meaning



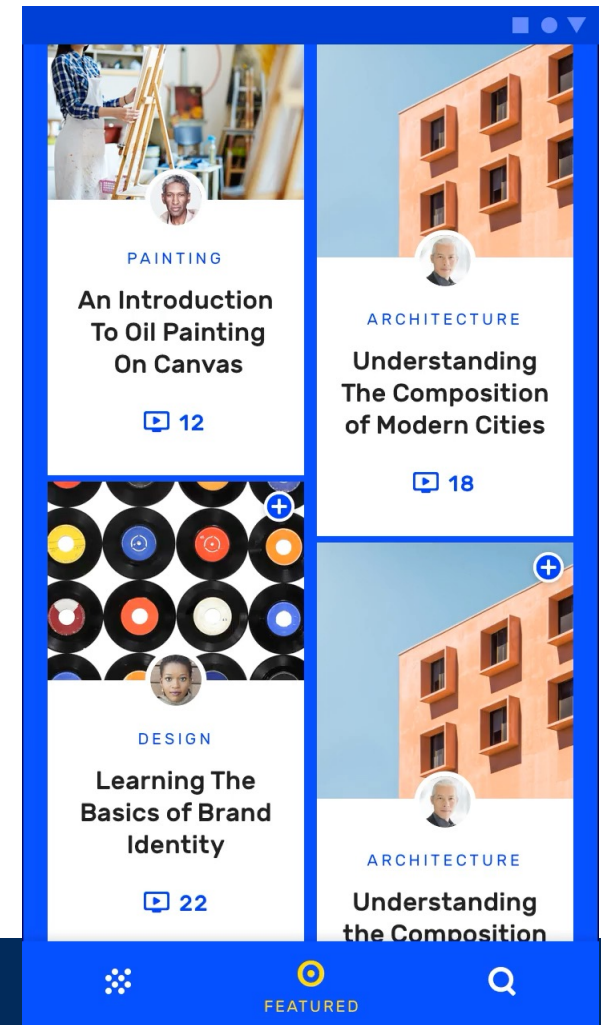
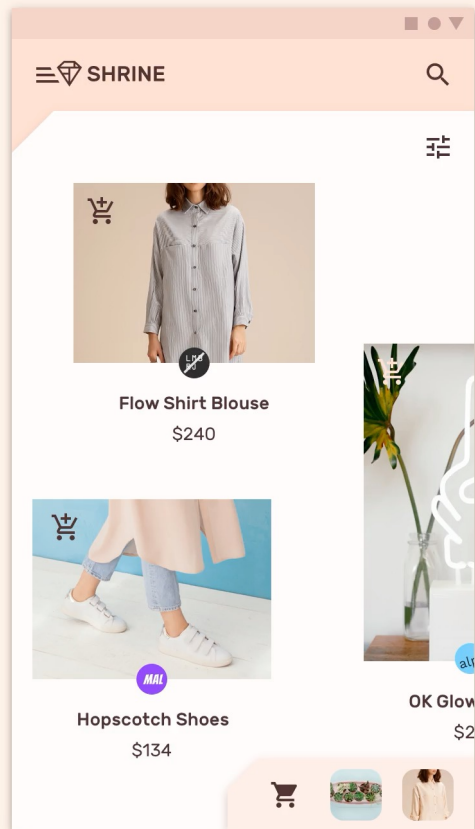
- How an object moves dictates
  - how heavy/light it is
  - Spatial relationships to other items
- Use natural, physically inspired animations



# Transitions



- Navigating between destinations

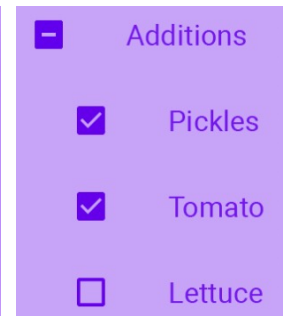
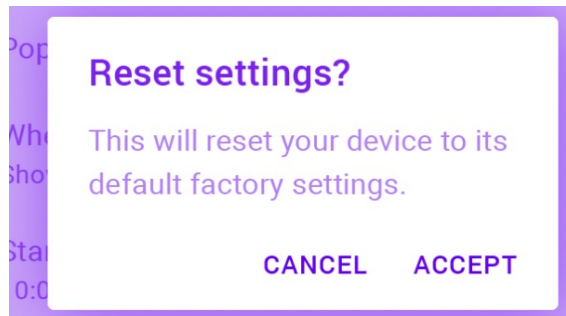
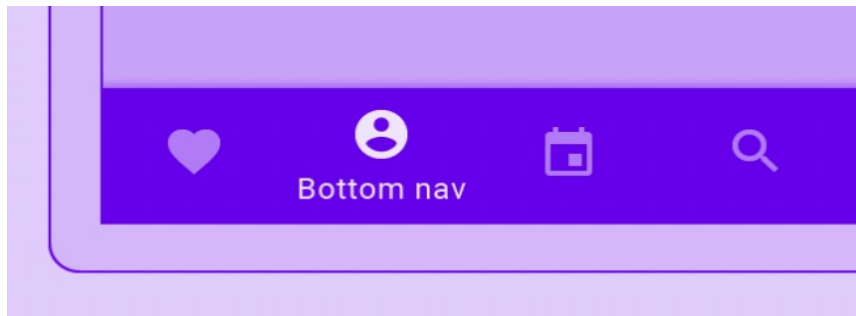
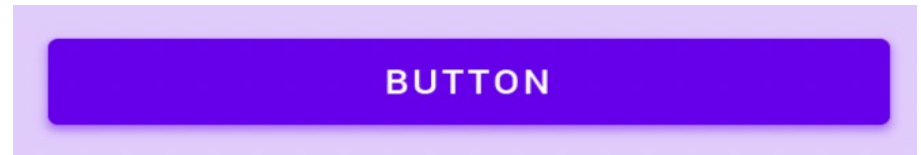
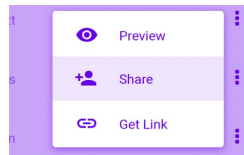
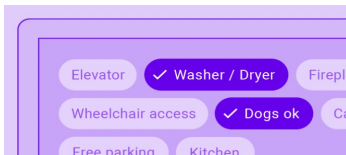
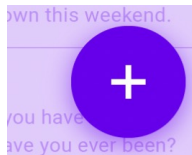
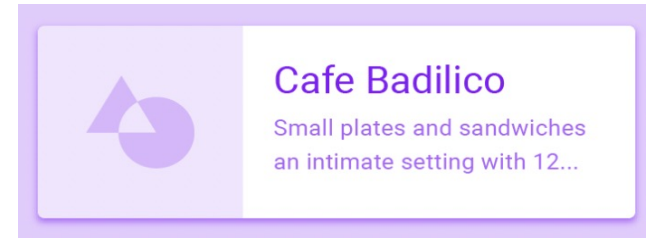
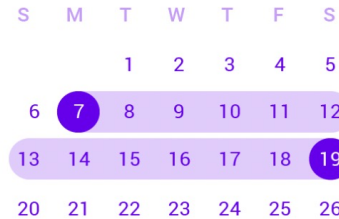
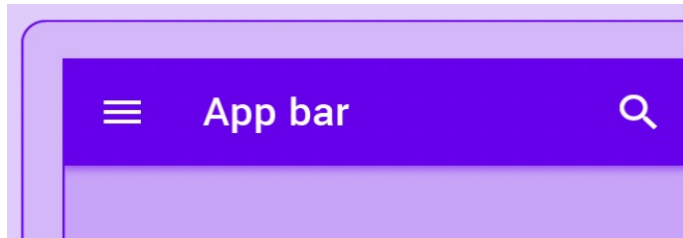


# Three Principles

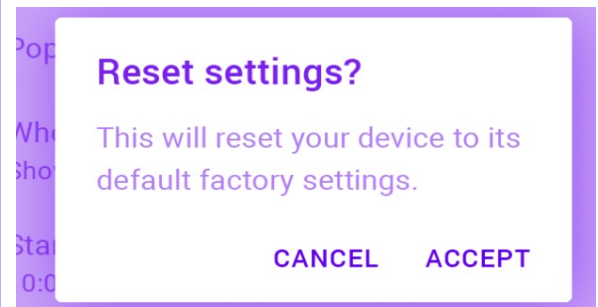
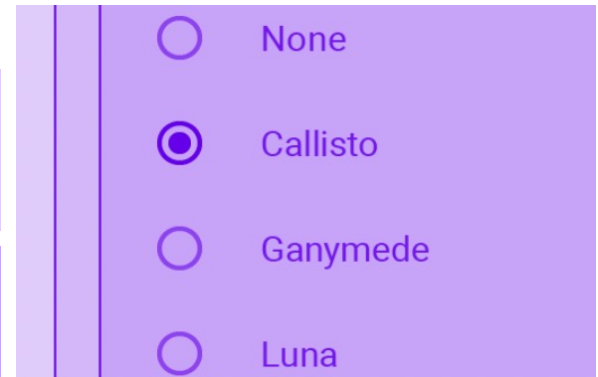
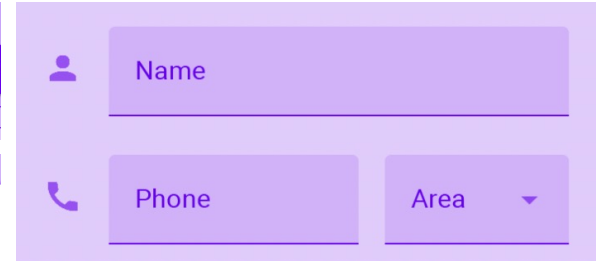
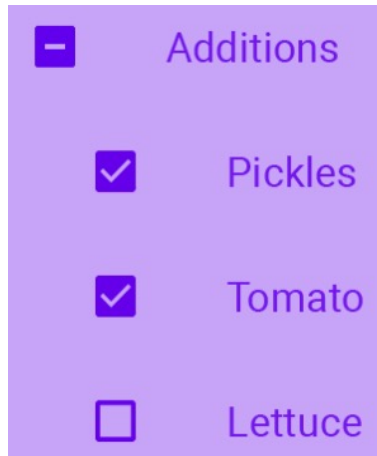
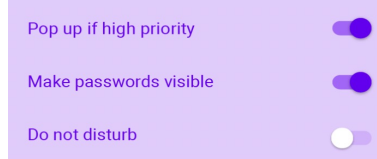
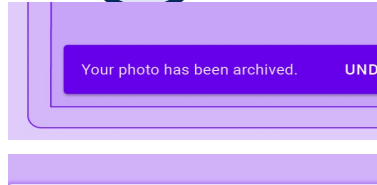
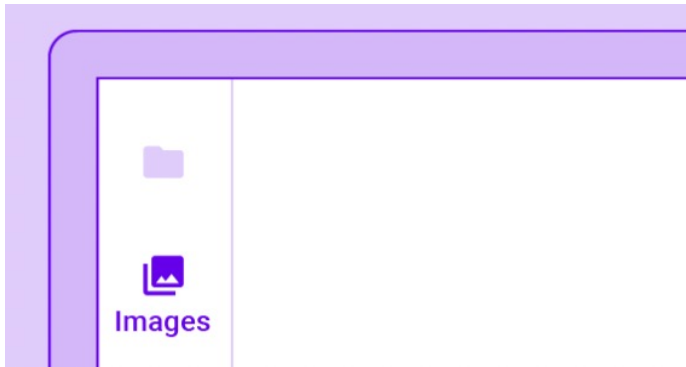
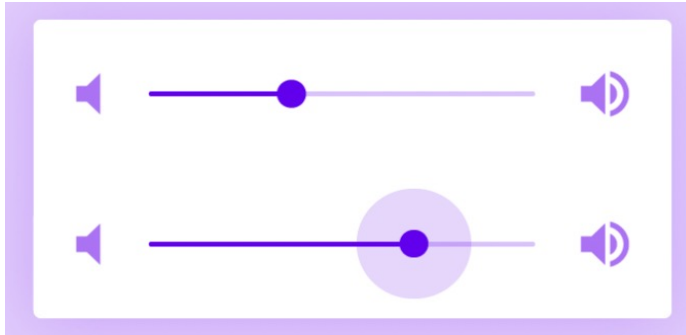


1. Material is the metaphor
  2. Bold, graphic, and intentional
  3. Motion provides meaning
- Material Components are created to ensure all three are adhered to

# Material Components



# Material Components Cont.



# To Do For Next Time



- Storyboards due tonight
- Lab03 due Tuesday