ANGULAR MATERIAL

MITI BHAT

WHAT IS MATERIAL DESIGN?

MATERIAL DESIGN IS A DESIGN LANGUAGE THAT DESCRIBE THE TENETS OF CREATING INTUITIVE AND CONSISTENT UI IN A SIMPLE WAY.

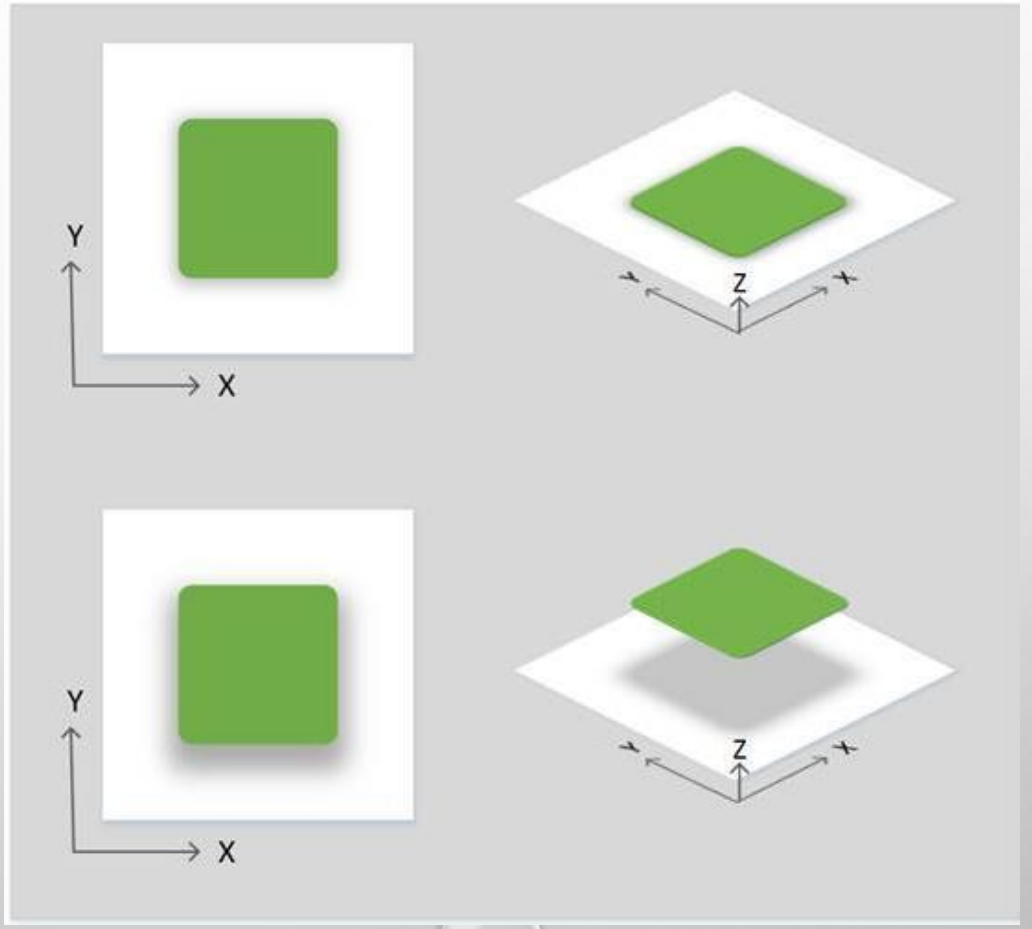
- IT USES THE METAPHOR OF PHYSICAL MATERIAL— SUCH AS PAPER AND INK—, AND IT IS AUTHENTICALLY DIGITAL. IT FOCUSES ON PRESENTING INFORMATION ON A WAY THAT HUMAN THINKING EASILY— EVEN SUBCONSCIOUSLY— PROCESSES, AND PROVIDING INTUITIVE INTERACTION WITH APPLICATIONS.
- THE CREATORS OF THIS DESIGN LANGUAGE PUT EMPHASIS ON SUPPORTING UNIFIED EXPERIENCE ACROSS DIFFERENT PLATFORMS AND DEVICE FORM FACTORS.

MATERIAL 3D ENVIRONMENT

- MATERIAL DIMENSIONS ARE SPECIFIED IN DENSITY-INDEPENDENT PIXELS. THEIR UNIT OF MEASURE IS DP, PRONOUNCED “DIPS”— SOON YOU WILL LEARN WHAT EXACTLY DP MEANS.
- EACH MATERIAL HAS A UNIFORM THICKNESS, WHICH IS 1DP, AND CASTS A SHADOW. THIS SHADOW IS USED TO REPRESENT THE ELEVATION (Z-POSITION) BETWEEN MATERIAL ELEMENTS.

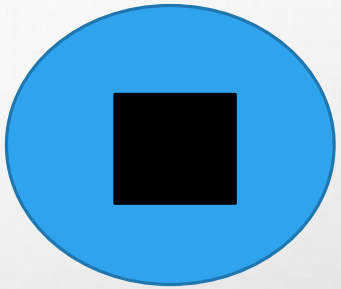
PRINCIPLE OF VIRTUALIZATION

- ON THE LEFT SIDE YOU SEE WHAT IS DISPLAYED ON THE DEVICE (OBSERVE THE SHADOWS), WHILE ON THE RIGHT SIDE YOU SEE THE 3D SCENE VIRTUALIZED BY THE MATERIAL.



MOTION

- MOTION IN MATERIAL DESIGN IS NOT FOR MOTION'S SAKE, IT HAS MEANING. THE AIM OF MOTION IS TO FOCUS ATTENTION AND MAINTAIN CONTINUITY. FOR EXAMPLE, WHEN YOU TOUCH SOMETHING ON THE SCREEN (OR CLICK IT WITH THE MOUSE), THE CONTACT IS PRESSED WITH A TOUCH RIPPLE. FIGURE SHOWS A RIPPLE EFFECT AS YOU CLICK (TOUCH) A CHECKBOX.



DESIGN

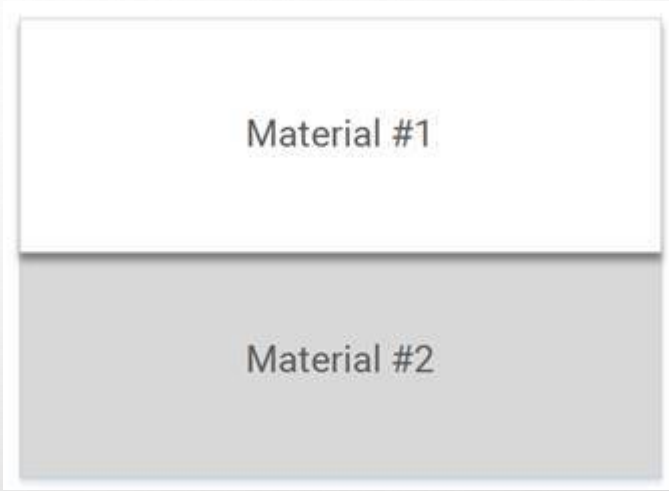
- MATERIAL DESIGN USES THE CONCEPT OF DENSITY-INDEPENDENT PIXELS DP
- THE FIRST CONCEPT TO UNDERSTAND IS PIXEL DENSITY, WHICH IS MEASURED IN PIXELS PER INCH— AND EVIDENTLY INDICATE THE NUMBER OF PIXELS THAT ARE IN AN INCH OF THE PARTICULAR DISPLAY. ITS UNIT OF MEASURE IS DPI (DOT PER INCH).
- DENSITY-INDEPENDENT PIXELS ARE FLEXIBLE UNITS THAT SCALE TO UNIFORM DIMENSIONS ON ANY SCREEN. A DP IS EQUAL TO ONE PHYSICAL PIXEL ON A 160-DPI SCREEN.

SEAMS

- TWO MATERIAL ELEMENTS THAT SHARE AN ENTIRE COMMON EDGE ARE CALLED SEAMS, AND THEY ALWAYS MOVE TOGETHER. FIGURE SHOWS AN EXAMPLE OF A SEAM, WHERE THE TWO ELEMENTS ARE JOINED BY A HORIZONTAL EDGE. OF COURSE, SEAMS CAN BE FORMED BY VERTICAL EDGES, TOO.

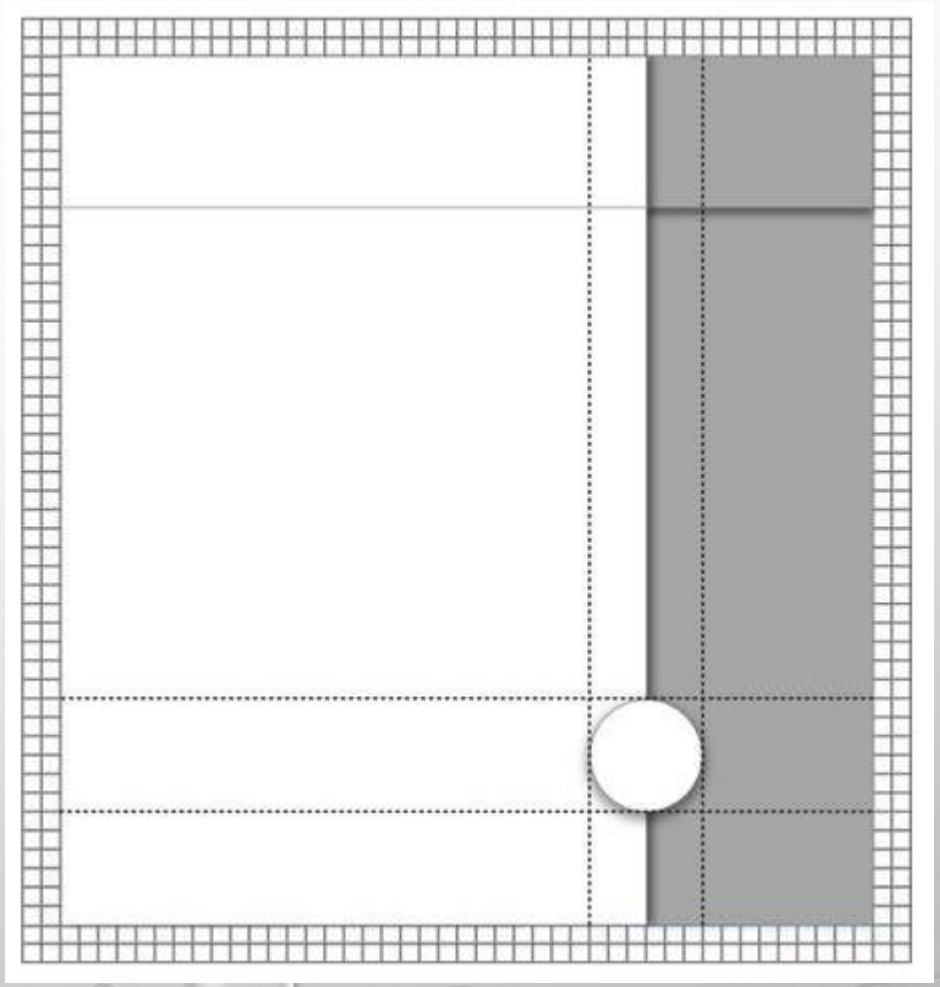
STEPS

- TWO MATERIALS MAY REPRESENT OVERLAPPING SHEETS OF PAPER, WITH DIFFERENT DEPTH (Z-POSITIONS). THEY FORM A STEP



BASELINE GRIDS

- MATERIAL ELEMENTS ALWAYS ALIGN TO AN 8DP SQUARE BASELINE GRID, INDEPENDENTLY WHETHER THE DISPLAYING DEVICE IS A PHONE, A TABLET, OR A DESKTOP. IT MEANS, THE DIMENSIONS OF ANY COMPONENT MUST BE A MULTIPLE OF 8DP. FIGURE SHOWS A SAMPLE WITH THE BASELINE GRID, WHERE EACH GRID CELL IS AN 8DP SQUARE.



ICONS

- ICONS AND IMAGES IN TOOLBARS ARE ALIGNED TO A 4DP GRID
- MATERIAL DESIGN HAS A VERY DETAILED SPECIFICATION ABOUT MOBILE, TABLET, AND DESKTOP LAYOUTS, WHERE KEYLINES AND SPACING ARE THOROUGHLY DESCRIBED. YOU CAN ALSO DOWNLOAD LAYOUT TEMPLATES FOR THESE DEVICE TYPES.

- HTTPS://MATERIAL.IO/DESIGN/LAYOUT/RESPONSIVE-LAYOUT-GRID.HTML

HEIRARCHY LEVELS

- THE SPECIFICATION SAYS THAT UNDER 600DP THE UI MAY FILL THE SCREEN ONLY WITH A SINGLE LEVEL OF CONTENT HIERARCHY, WHILE OVER 600DP THE LAYOUT CAN DISPLAY TWO HIERARCHY LEVELS. IT MEANS THAT ON “LARGE ENOUGH” SCREENS YOU CAN DISPLAY A SUMMARY AND DETAIL AT THE SAME TIME, WHILE ON “SMALL” SCREENS YOU CAN SHOW ONLY SINGLE CONTENT THAT CAN BE EITHER SUMMARY OR DETAIL, BUT NEVER THESE TWO AT THE SAME TIME.

GRID

- THE UI IS BASED ON A GRID LAYOUT (DO NOT MISS IT WITH THE 8DP BASELINE GRID), SO YOU SHOULD ALIGN COMPONENTS TO THE GRID THAT FILLS UP THE WHOLE WIDTH OF THE SCREEN. WHEN THE SCREEN IS VERY WIDE (OVER 1600 DP), THE GRID MAY DO ONE OF THE FOLLOWINGS THINGS:
- 1. BECOME CENTER ALIGNED WITH INCREASED MARGINS (SO THAT THE FULL GRID IS 1600DP WIDE).
- 2. REMAIN LEFT-ALIGNED WHILE THE RIGHT MARGIN GROWS. 3. CONTINUE TO GROW AND REVEAL ADDITIONAL CONTENT ANGULAR MATERIAL USES ONLY A SET OF THESE BREAKPOINTS, AND DEFINES ONLY THREE DIFFERENT SCREEN SIZES. UNDER 600DP THE SCREEN SIZE IS SMALL. SCREEN SIZES BETWEEN 600DP AND 959DP ARE TAKEN INTO ACCOUNT AS MEDIUM. SCREENS WITH A WIDTH OF 960DP OR OVER ARE LARGE.

COLOR THEMES

- MATERIAL DESIGN OFFERS MORE THAN A DOZEN PREDEFINED COLOR PALETTES THAT COMPRISE PRIMARY AND ACCENT COLORS. A COLOR PALETTE CONTAINS TEN PRIMARY COLORS AND FOUR ACCENT COLORS. PRIMARY COLORS ARE NUMBERED FROM THE BRIGHTEST TO THE DARKEST. THE FIRST HUE IS IDENTIFIED AS 50, THE NEXT ARE 100, 200, TILL 900 WITH AN INCREMENT OF 100. THE ACCENT COLORS HAVE IDENTIFIERS, TOO, SUCH AS A100, A200, A400, AND A700— THEY ARE MORE VIVID THAN THE PALETTE OF PRIMARY COLORS. THE SPECIFICATION SUGGESTS TO USE COLOR 500 AS THE MAIN COLOR OF YOUR PAGES, AND USE THE OTHERS AS POTENTIAL ACCENT COLORS.

ICONS AND IMAGES

- MATERIAL DESIGN USES ICONS AS PRIMARY FORM OF COMMUNICATION WITH USERS. IT ENCOURAGES YOU TO APPLY MODERN ICONS THAT HAVE BOLD AND GEOMETRIC SHAPES. THE SPECIFICATION MAKES DISTINCTION BETWEEN SYSTEM ICONS— THEY REPRESENT COMMON ACTIONS SUCH AS ADD, SAVE, PRINT, TRASH, ETC.— AND PRODUCT ICONS— THESE ARE THE VISUAL EXPRESSION OF A BRAND'S PRODUCTS AND SERVICES. ALTHOUGH YOU NEED AN EXPERIENCED DESIGNER TO ESTABLISH THE PORTFOLIO OF PRODUCT ICONS THAT COMMUNICATE YOUR BRAND'S VALUES, GOOGLE OFFERS HUNDREDS OF MATERIAL DESIGN SYSTEM ICONS YOU CAN USE OUT-OF-THE-BOX.

LAYOUT

- CARD
- GRIDLIST
- TABS
- DIVIDER
- EXPANSION PANEL
- LIST
- STEPPER
- TREE

SCREEN SIZES

Mnemonic Media Query
xs (max-width: 599px)
gt-xs (min-width: 600px)
sm (min-width: 600px) and (max-width: 959px)
gt-sm (min-width: 960px)
md (min-width: 960px) and (max-width: 1279px)
gt-md (min-width: 1280px)
lg (min-width: 1280px) and (max-width: 1919px)
gt-lg (min-width: 1920px)
xl (min-width: 1920px)

FLEXBOX

- THE ANGULAR MATERIAL GRID SYSTEM IMPLEMENTATION IS BASED ON CSS WITH FLEXBOX (CSS FLEXIBLE BOX LAYOUT MODULE).

DEMO & PRACTICE

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