Engineering 28
University of California

• Lecture #2
  – Sketching
Informal Drawings (Sketches)

- "Engineer-to-engineer" graphic assist in a verbal explanation.
- Compromise between time and clarity
- Used where a lot of control exists, i.e. Etcheverry Hall Model Shop
- Used to improve Spatial Reasoning ability
Spatial Reasoning Ability?

A  B  C  D
Spatial Reasoning Ability?
Spatial Reasoning Ability?

- The initial shape is rotated to the final shape.

Choose the shape that matches the transformation:

A

B

C

D
Back to Sketches…

• Major Properties
  – Quickly prepared
  – Simply constructed
  – Easily understood, even by non-engineers
Tools

• Eye, hand, pencil, paper (primary)
• Triangles, scales, templates, other instruments (secondary)
• Computer (formal)
Techniques

• Emphasize techniques, not tools
• Do the most with the least.
  (Will not always have access to CAD)
**Sketching Lines**

- Light, brisk strokes to establish lines
- Let inertia of the arm assist, don't overemphasize finger control
- Eyes away from paper, use peripheral vision
- Use destination points for sighting
- Rotate the paper to assist line sketching
Curves, Circles, Ellipses

- Establish boundary lines
- Establish crossing points
- Establish tangent points and angles
- Use light stokes, then fill in
Curves, Circles, Ellipses
**Objects**

- 3-D is best way to communicate
- Make the **Foundation**: the view to best represent, the space it occupies
- Add the **Frame**: the object outline
- **Finish** the product: small details, texture (amount depends on purpose)
Objects
Objects
Cartooning

- Motion
- Sound
- Temperature
- Any sort of mechanical action
Cartooning

• The ball
• The resistor
• The hammer
• The crate
• The disk
“3D” Pictorials

• Advantages: Conveys information quickly
• Disadvantages: Distorted, cannot be scaled
• Types
  – Oblique
  – Isometric
  – Perspective
A Rendered Image
A Multi-view Drawing
Pictorials
Coded Plans

CODED PLAN IN
2-D SPACE
Coded Plan In 2-D Space

Coded Plan In 3-D Space

Building From Coded Plan

Isometric Sketch From Coded Plan
CODED PLAN IN 2-D SPACE

CODED PLAN ON 3-D SPACE

BUILDING FROM CODED PLAN

ISOMETRIC SKETCH FROM CODED PLAN
Labeled Corners

Coded plan in 2-D space
Corner Views

CODED PLAN IN 2-D SPACE

w - CORNER

x - CORNER

y - CORNER

z - CORNER
End

• Questions?