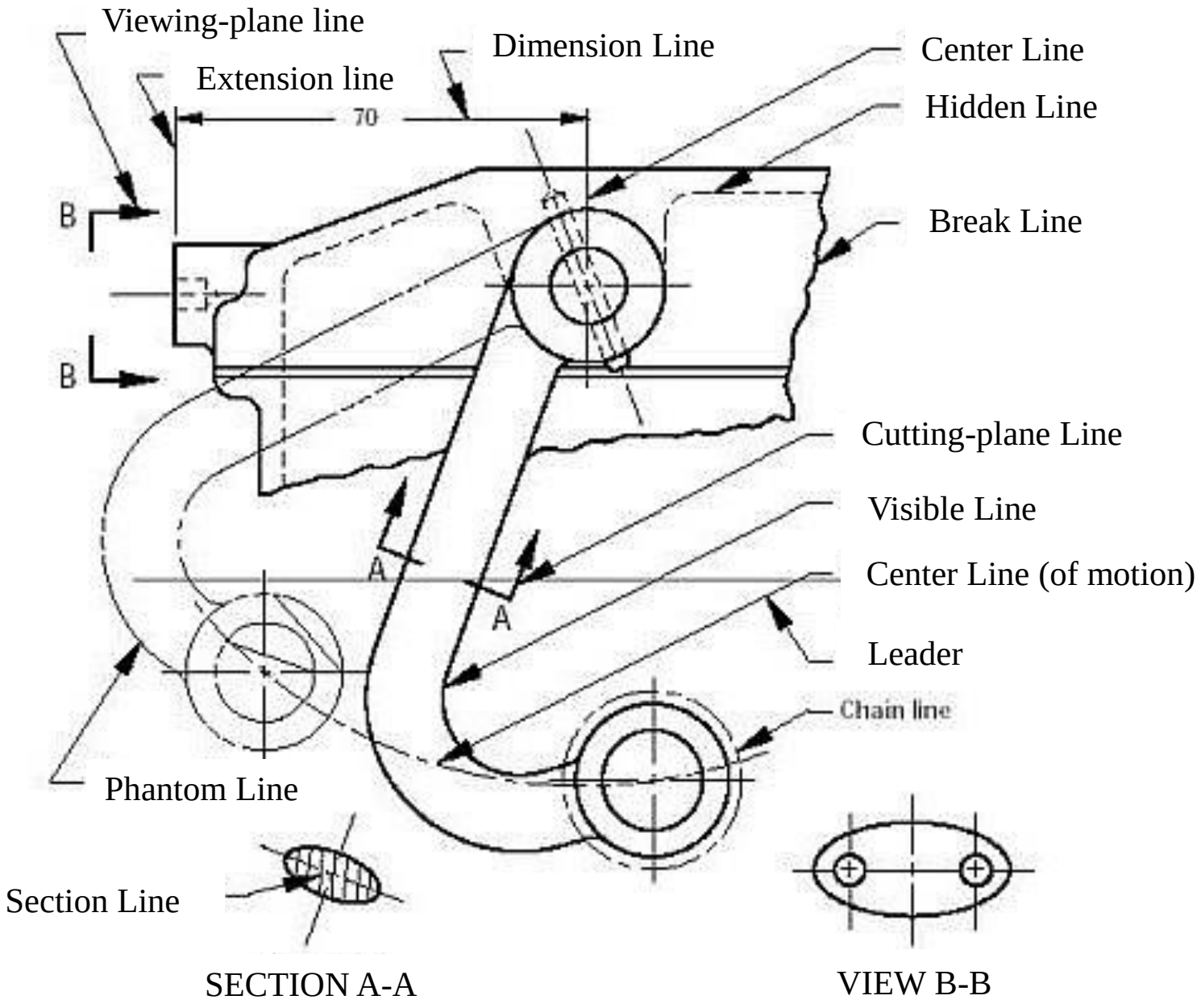
Engineering Drawing

Line Conventions

- Visible Lines – solid thick lines that represent visible edges or contours
- Hidden Lines – short evenly spaced dashes that depict hidden features
- Section Lines – solid thin lines that indicate cut surfaces
- Center Lines – alternating long and short dashes
- Dimensioning
  - Dimension Lines - solid thin lines showing dimension extent/direction
  - Extension Lines - solid thin lines showing point or line to which dimension applies
  - Leaders – direct notes, dimensions, symbols, part numbers, etc. to features on drawing
- Cutting-Plane and Viewing-Plane Lines – indicate location of cutting planes for sectional views and the viewing position for removed partial views
- Break Lines – indicate only portion of object is drawn. May be random “squiggled” line or thin dashes joined by zigzags.
- Phantom Lines – long thin dashes separated by pairs of short dashes indicate alternate positions of moving parts, adjacent position of related parts and repeated detail
- Chain Line – Lines or surfaces with special requirements



Source: http://www.genium.com/pdf/dmpc.pdf

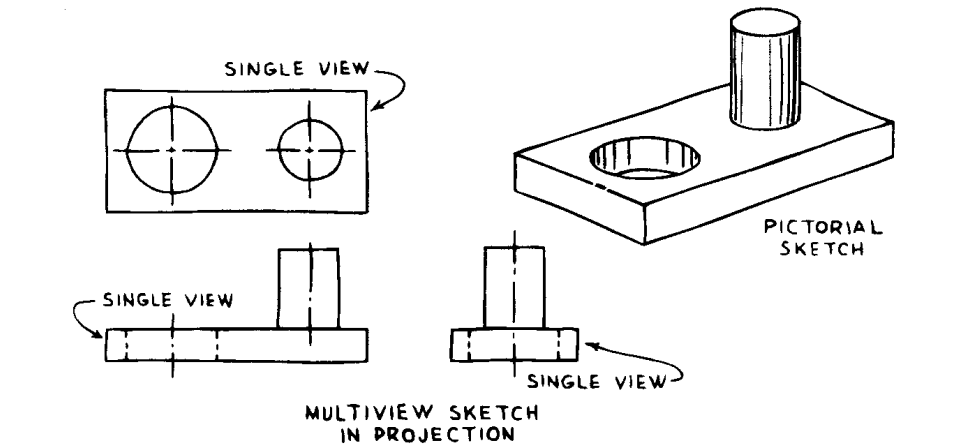
Lettering

- Plain Gothic
- *Italics are OK*
- ABCDEFGHIJKLMNOPQRSTUVWXYZ
- abcdefghijklmnopqrstuvwxyz

Sketching

- Drawings made without mechanical drawing tools
  - Free-Hand
  - Ruler
  - Simple drawing program

Figure C.2



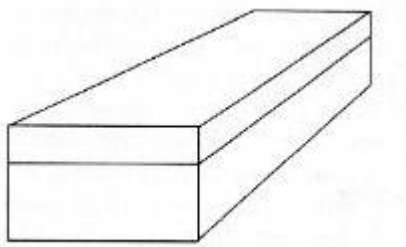
Freehand drawings.

From Course Text

- Should follow standards and conventions

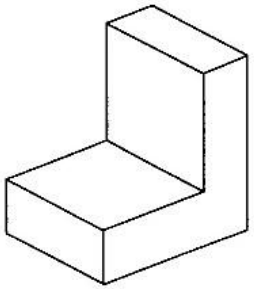
Pictorial

- 3-dimensional representations
  - One-point
    - one vanishing point
    - lines that are not vertical or horizontal converge to single point in distance



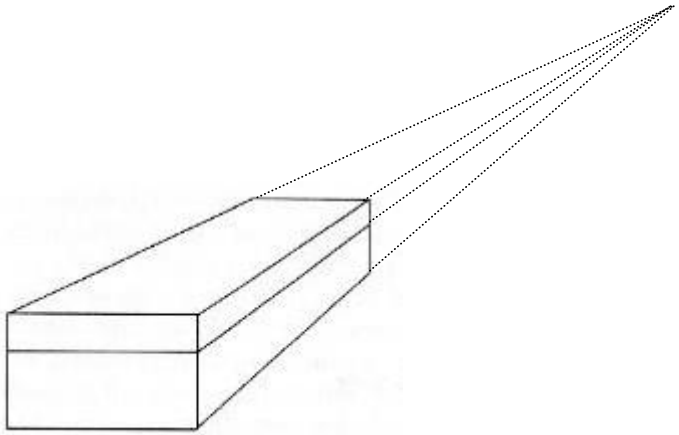
  - Two-point or Three-point
    - two or three vanishing points
      - With two points, vertical **or** horizontal lines parallel, but not both
      - With three-point, no lines are parallel

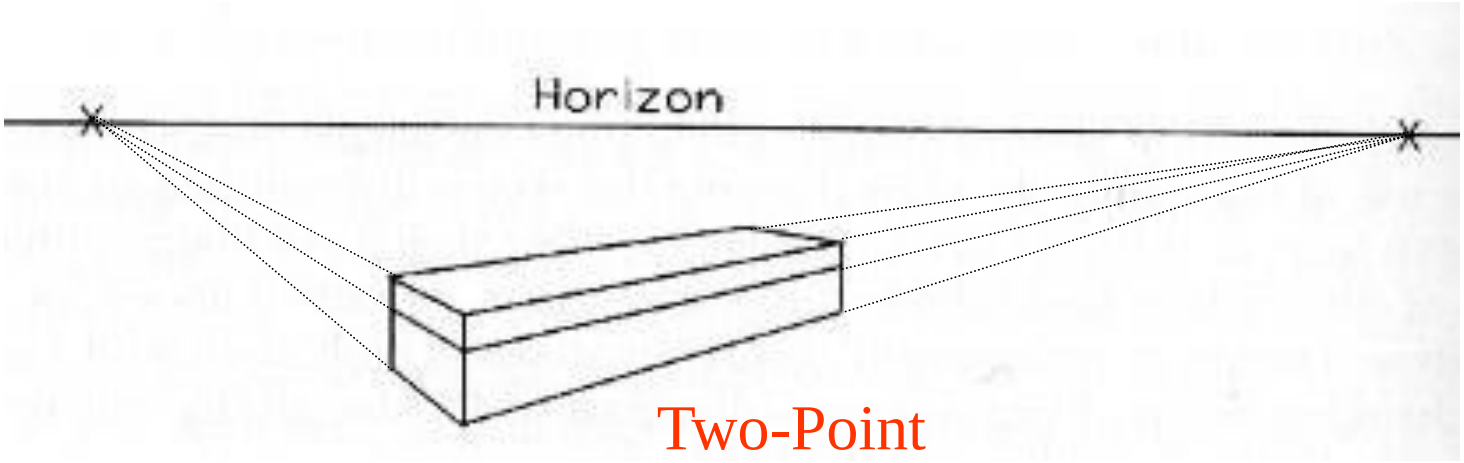
  - Isometric
    - Drawing shows corner of object, but parallel lines on object are parallel in drawing
    - Shows three dimensions, but no vanishing point(s)



Source: “Introduction to Engineering”, by Paul Wright

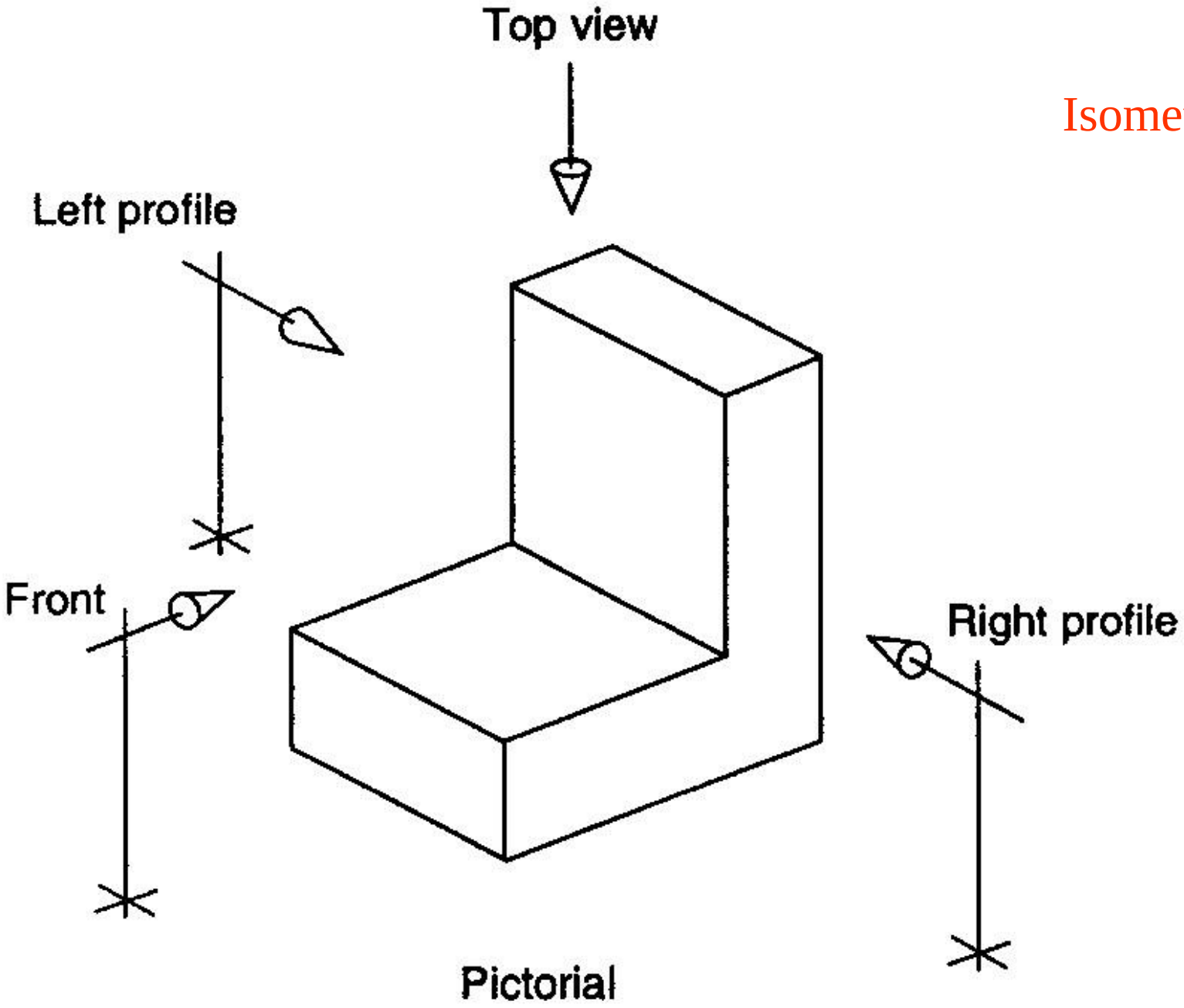
One-point





Two-Point

Source: “Introduction to Engineering”, by Paul Wright

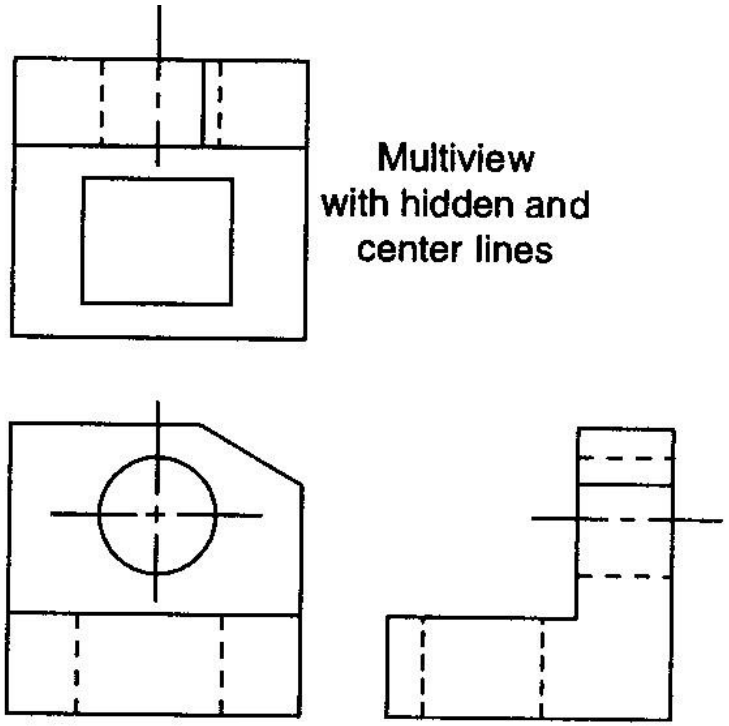


Isometric

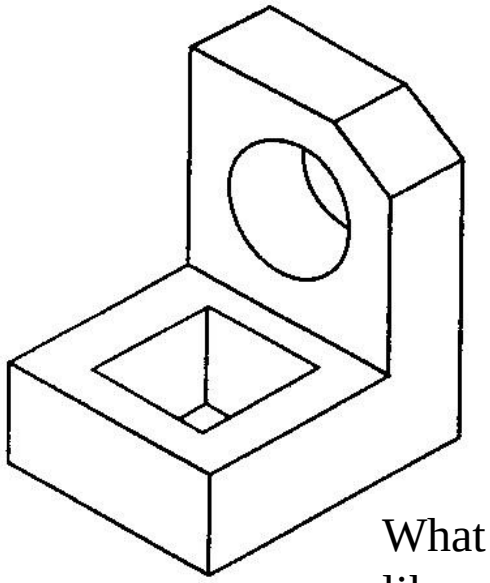
From Course Text

Orthographic / Multiview

- Draw object from two / three perpendicular views

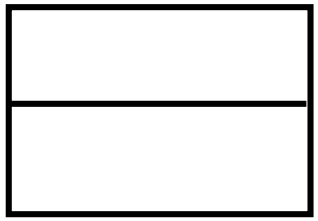


Multiview drawing / Orthographic

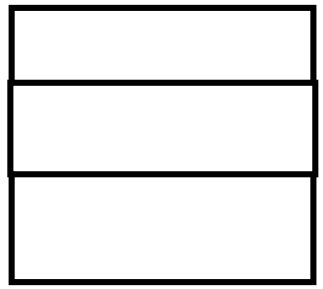


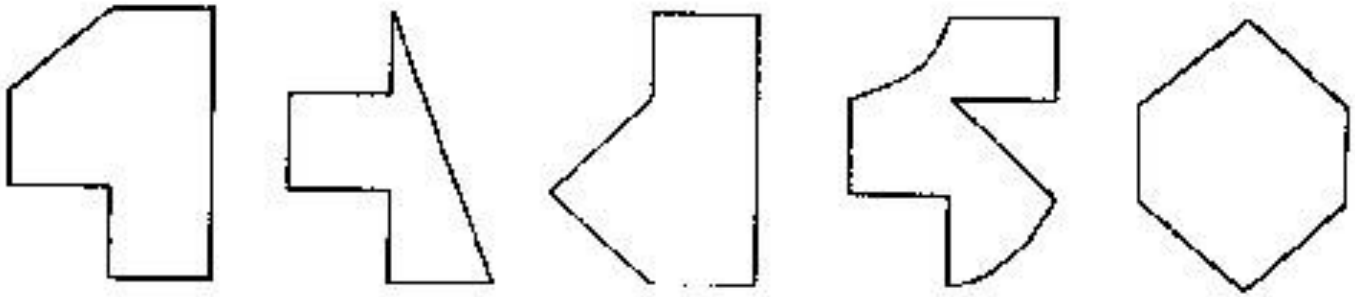
What it looks like pictorially

From Course Text



Five correct profile projections given
top and front views

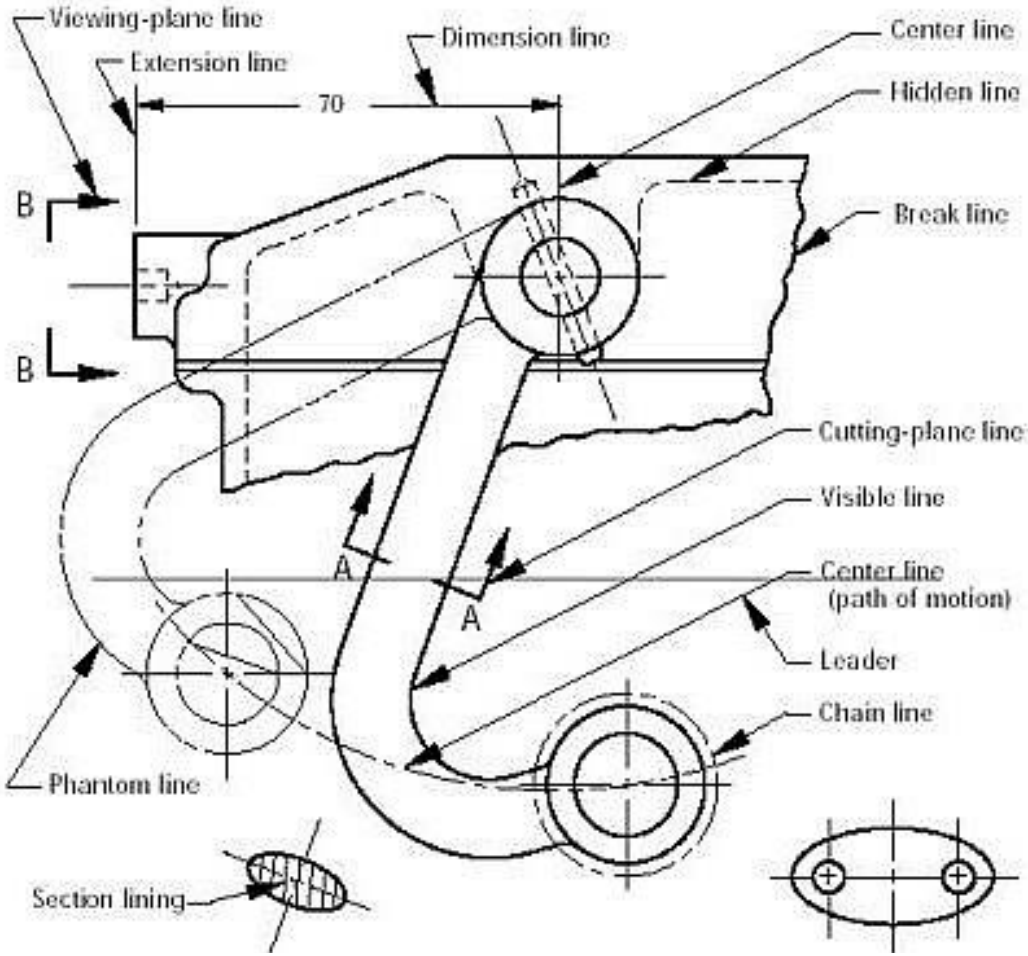




Necessary views.

Section Views

- If three views are not enough, draw sections needed to completely describe the object.



Section A-A

View B-B

Auxiliary Views

- Used to show true dimensions of an inclined plane.

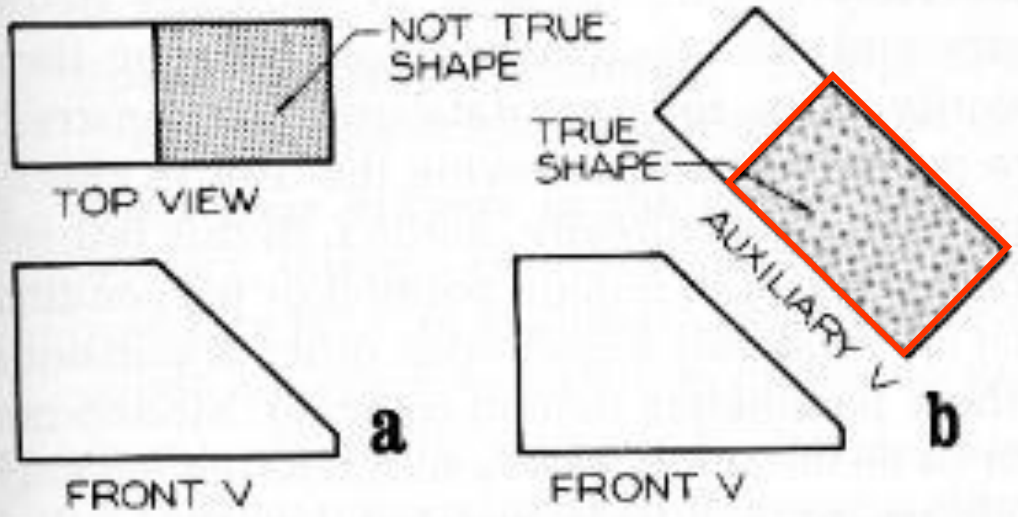
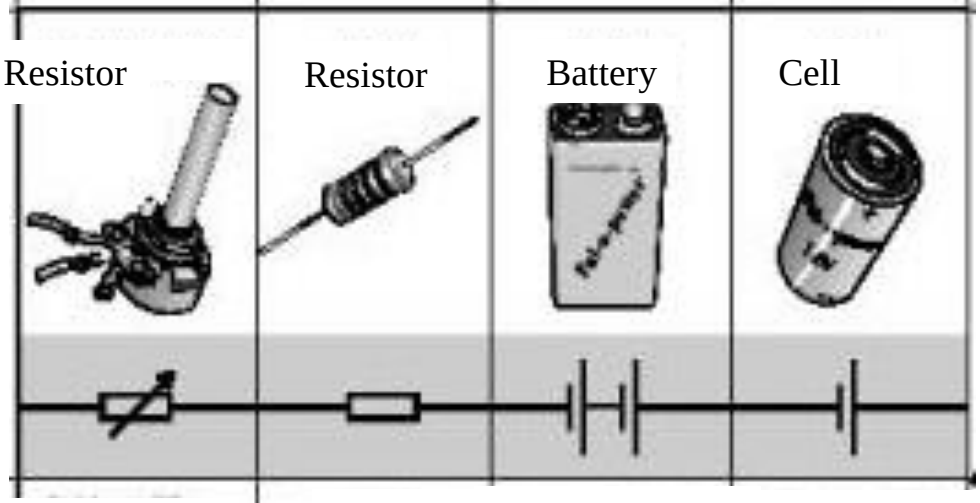
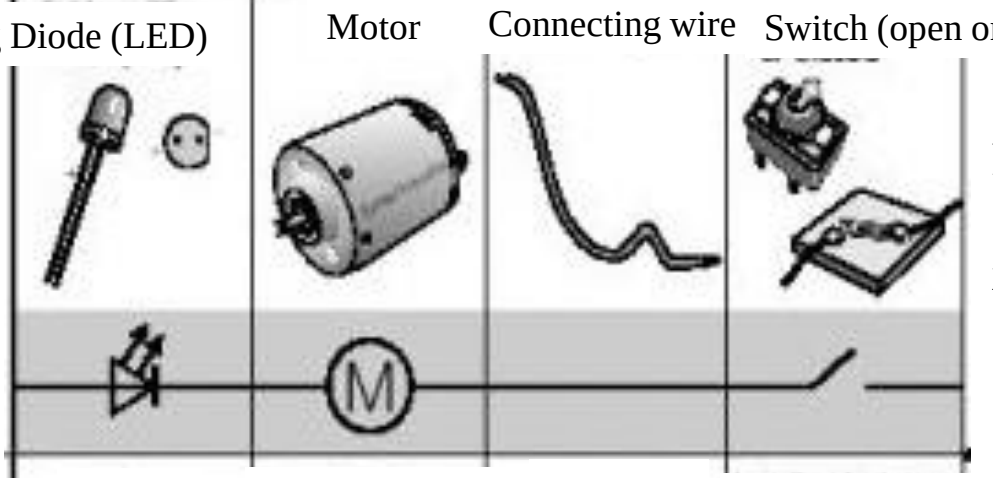


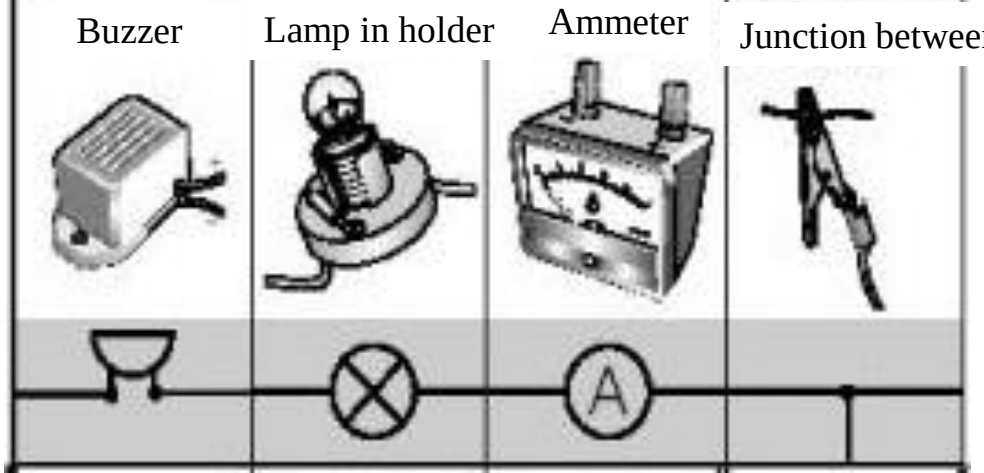
Figure 6.13 *An illustration of an auxiliary view. (Source: James H. Earle,* Engineering Design Graphics, *5th Edition, Addison-Wesley Publishing Co., Boston, MA, copyright © 1987. Reprinted with permission of Pearson Education, Inc., Upper Saddle River, NJ.)*

Source: "Introduction to Engineering", by Paul Wright

Electrical Circuit Symbols





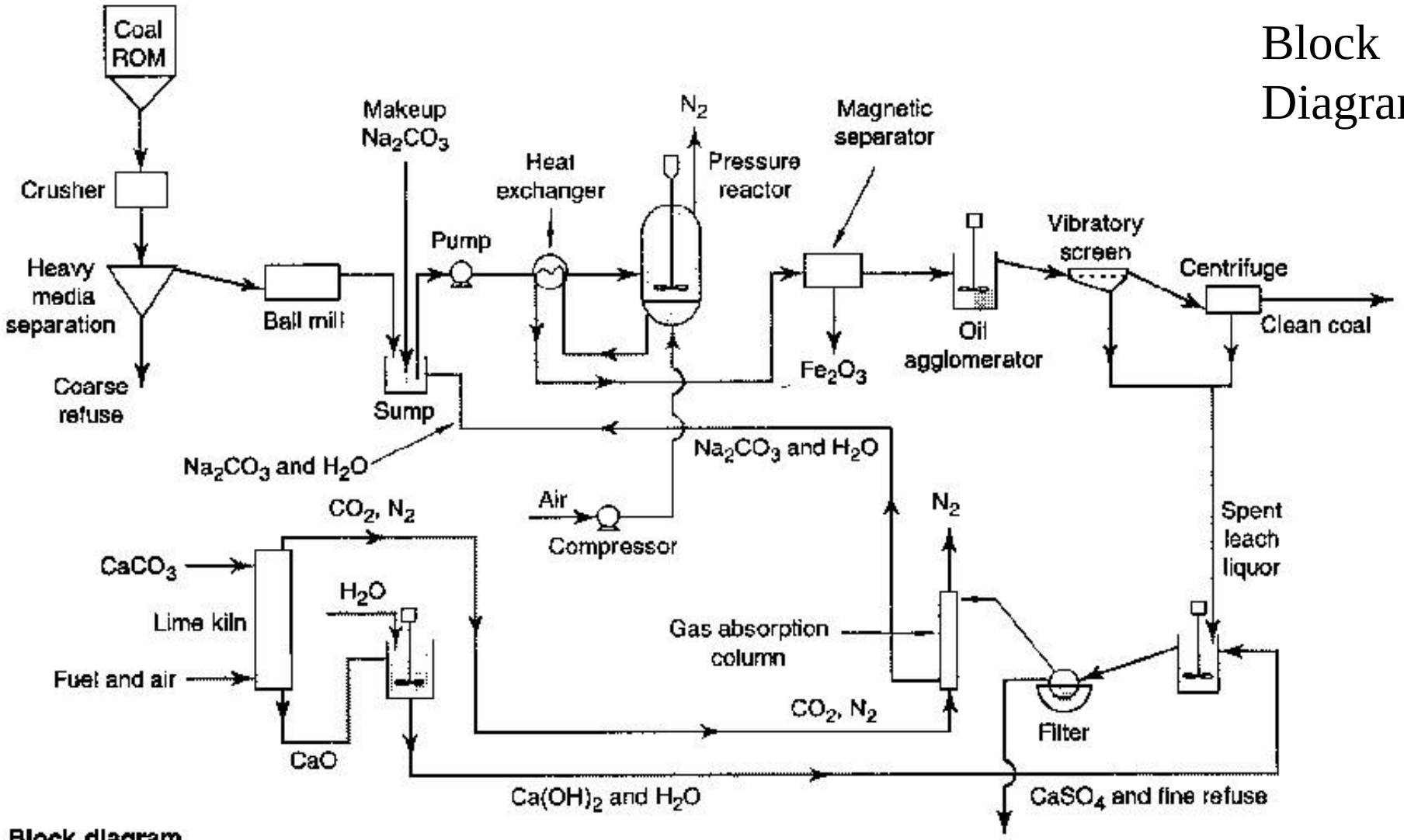


For good websites with more symbols, type “Schematic Symbols” into a web search engine.

Source: http://www.cleapss.org.uk/

Chemical Process Block Diagram

Figure C.34



Block diagram.

Online module on block diagrams

From Course Text