Section Views

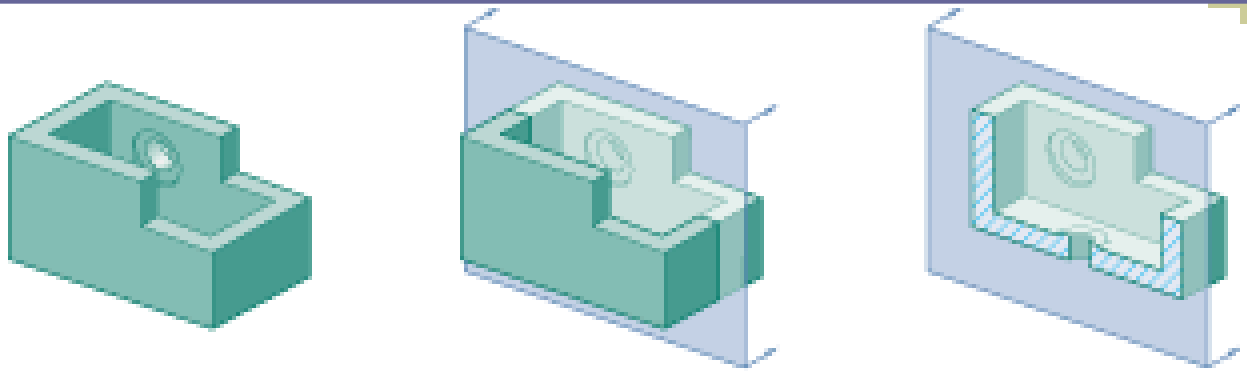
Section Views

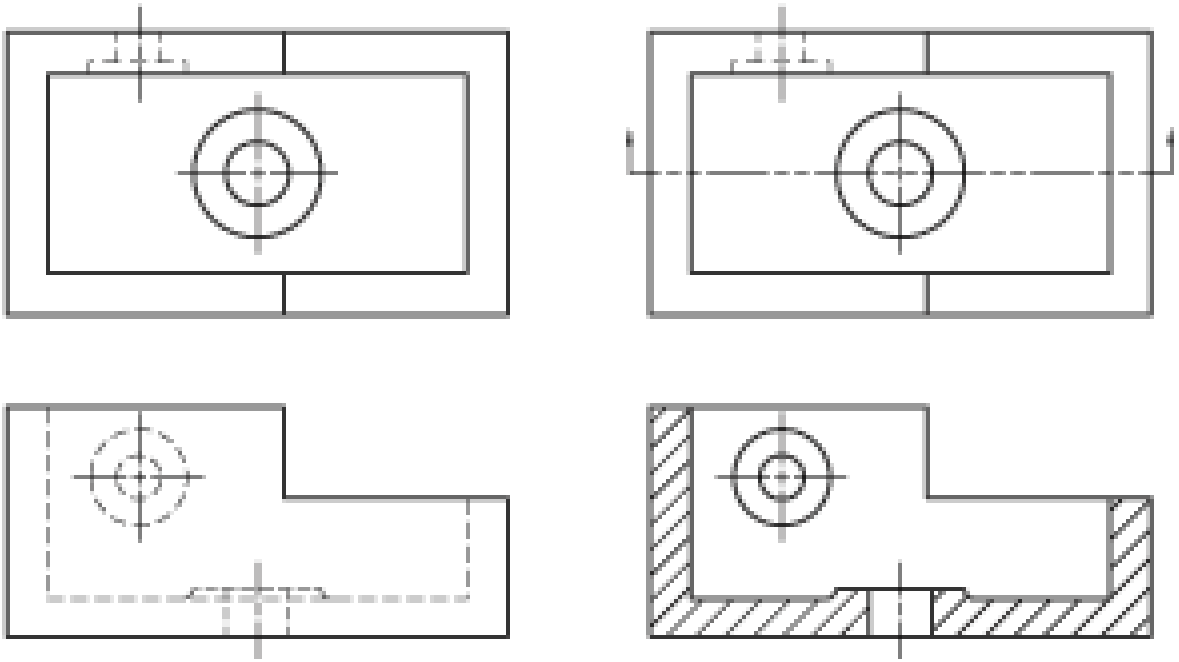
- The technique called section views is used to improve the visualization of new designs, clarify multiview drawings and facilitate the dimensioning of drawings. For mechanical drawings section views are used to reveal interior features of an object that are not easily represented using hidden lines.

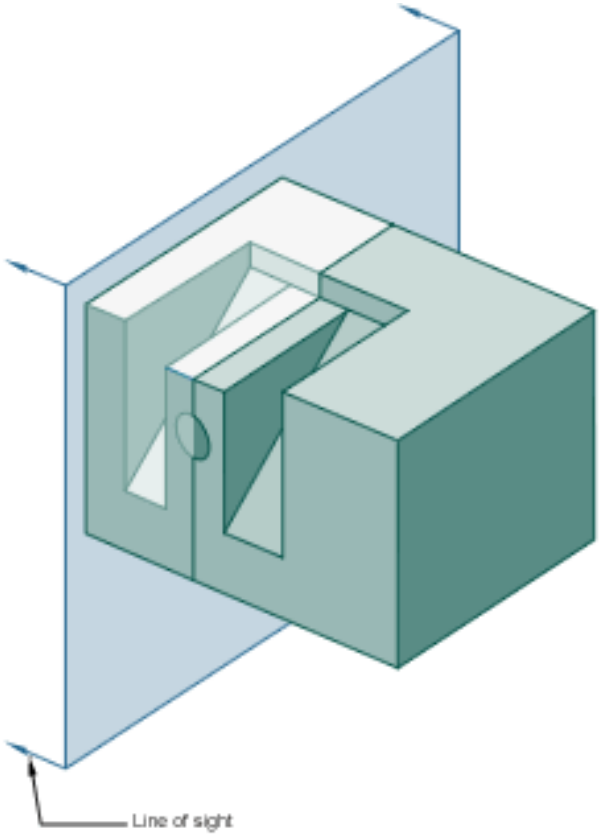
Section Views

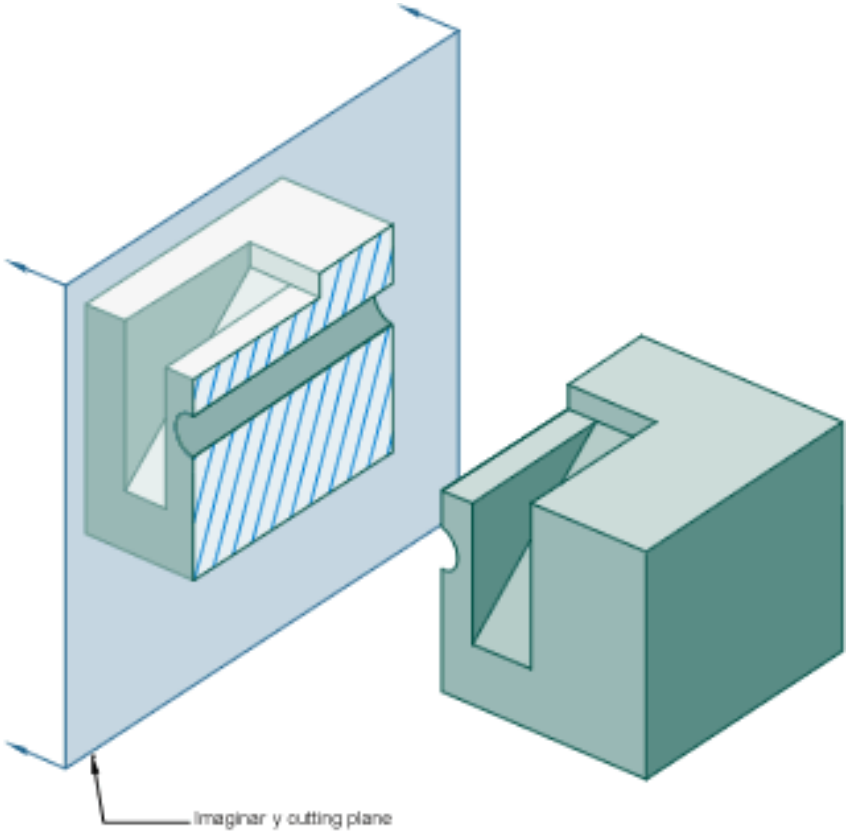
- **Sectional drawings** are multiview technical drawings that contain special views of a part or parts, a view that *reveal interior features*. In the figure a regular multiview drawing and a sectioned multiview drawing of the same part in the front view, the hidden features can be seen after sectioning.
- Traditional sections views are based on the use of an imaginary **cutting plane** that cuts through the object to reveal interior features.

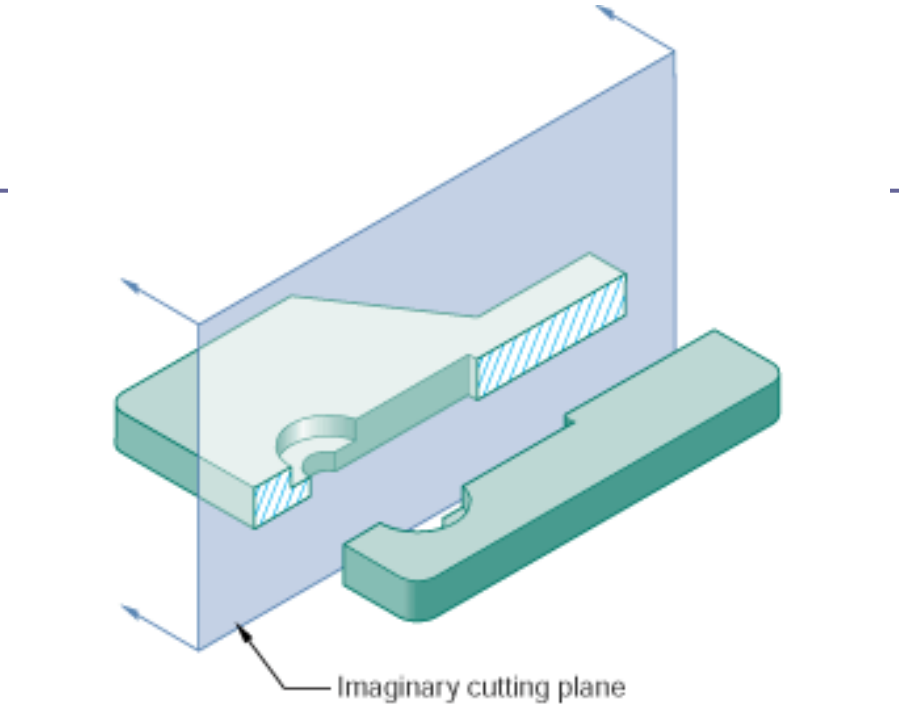
Section Views

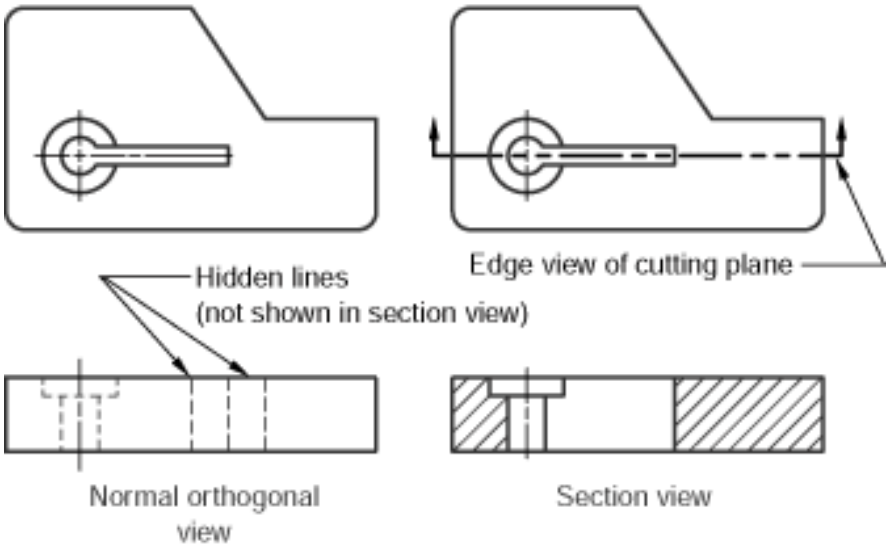


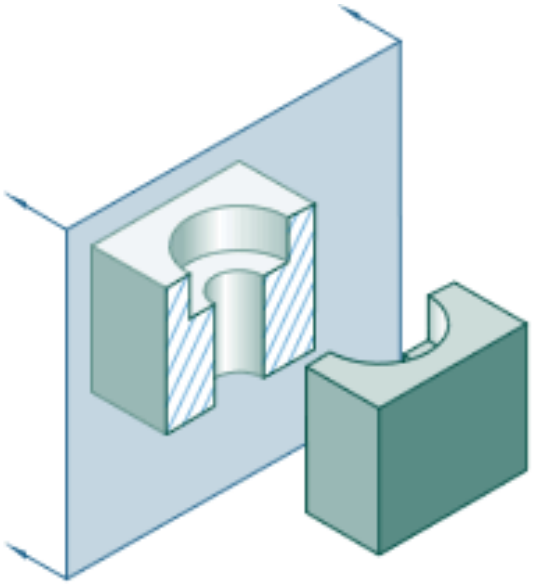


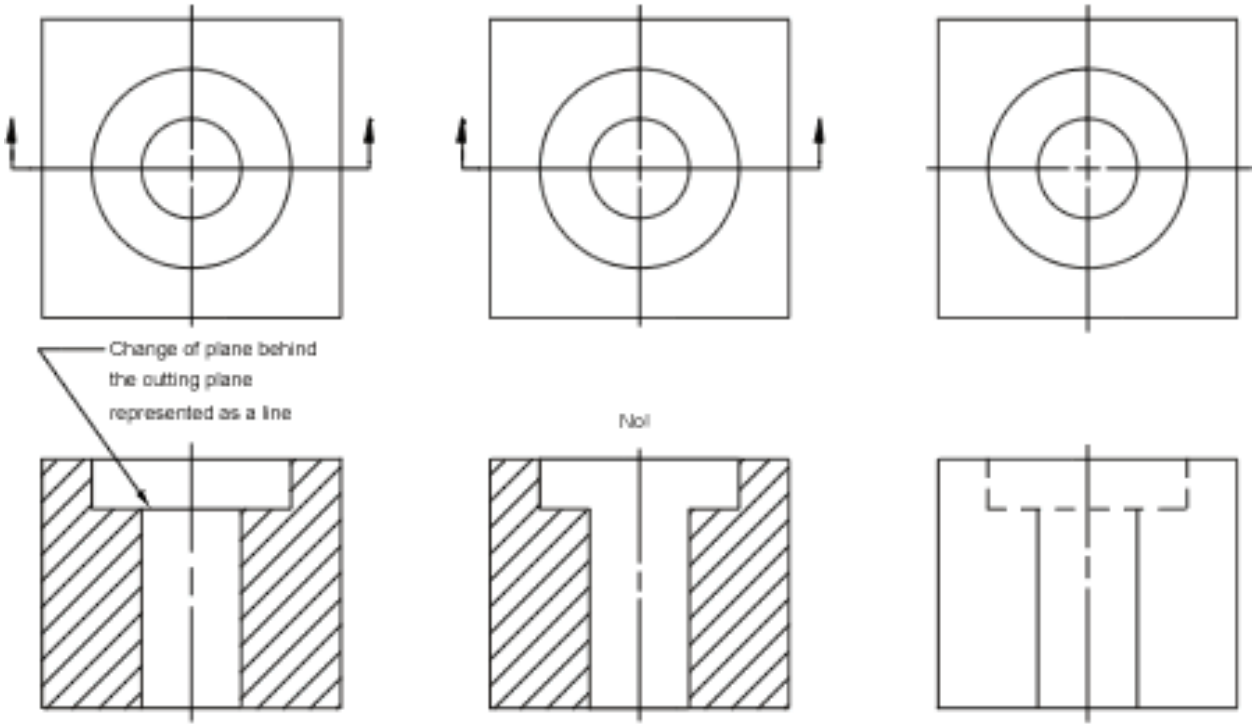

Line of sight


Imaginar y cutting plane

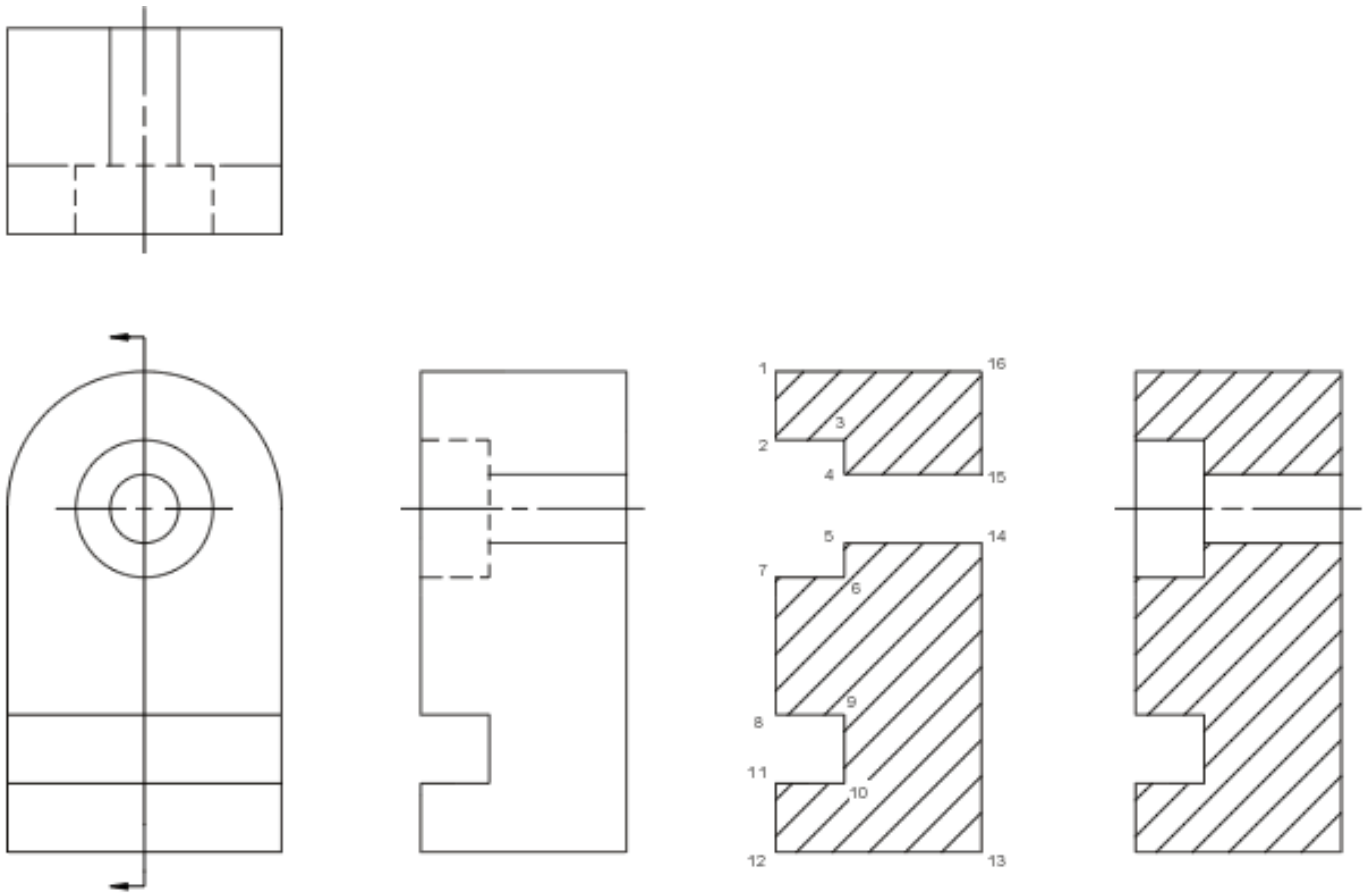

Imaginary cutting plane

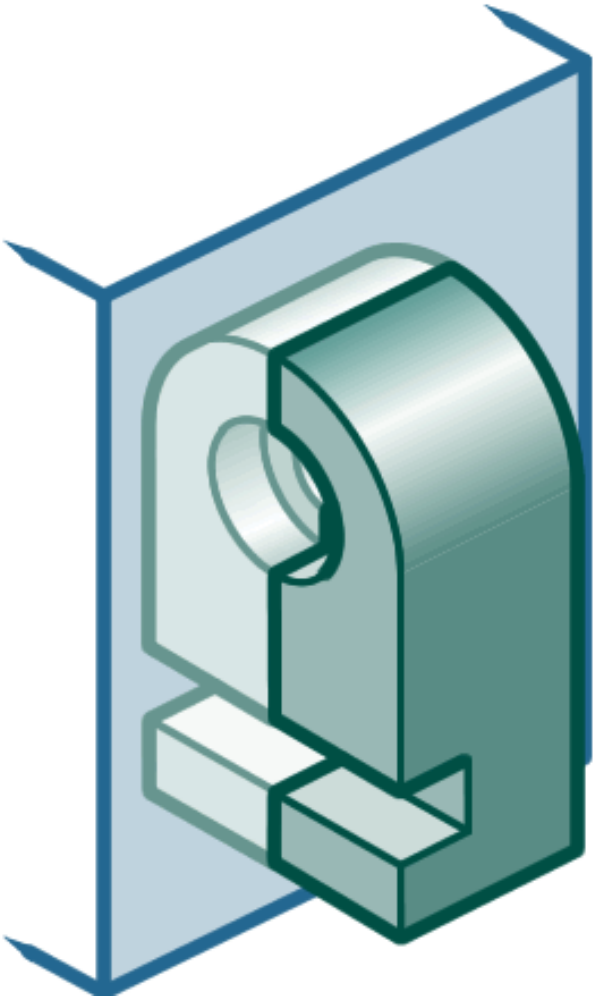

Edge view of cutting plane
Hidden lines
(not shown in section view)
Normal orthogonal
view
Section view

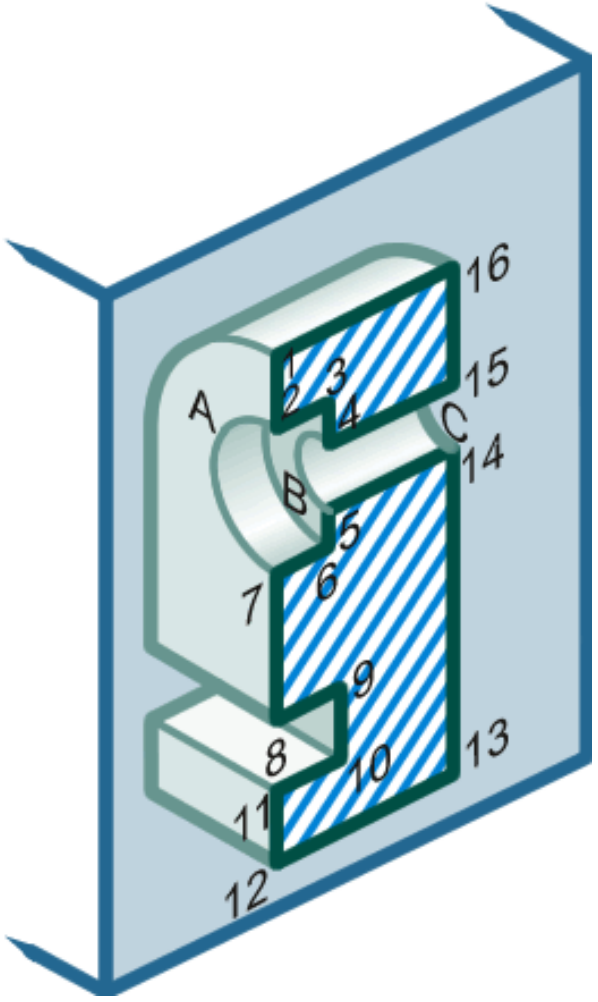



Change of plane behind
the cutting plane
represented as a line
No!
(A) Correct representation
(B) Incorrect representation
(C) Nor mal multivie w

- Visualization

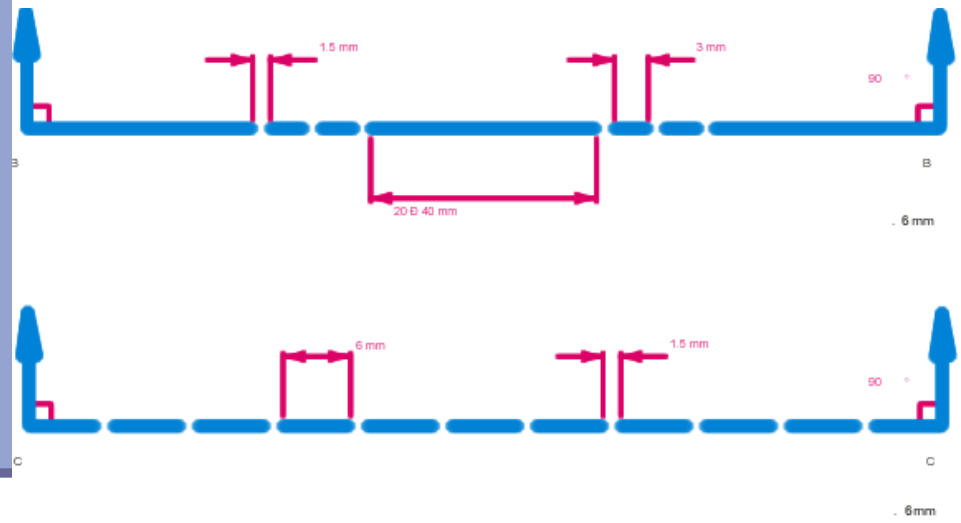


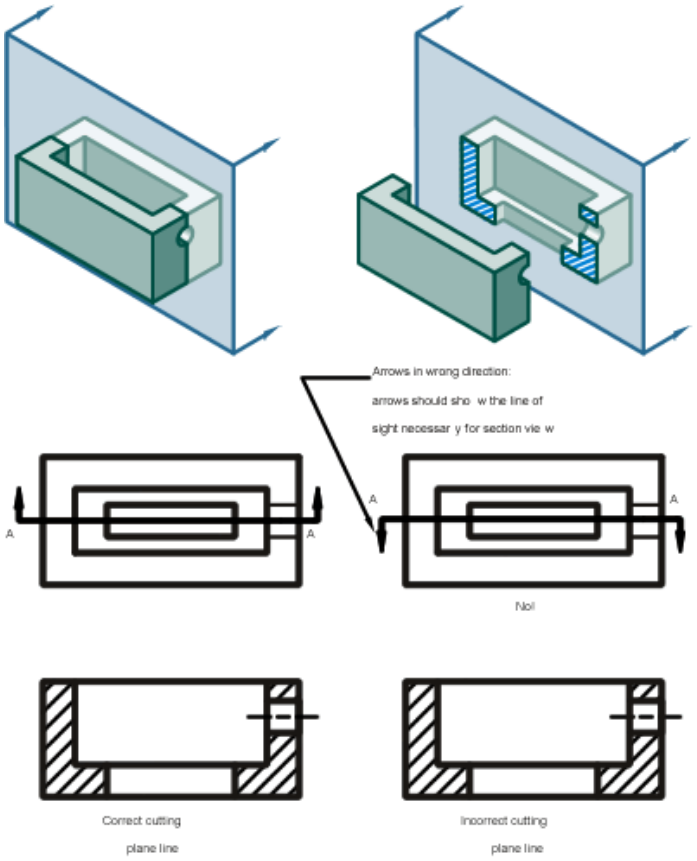



16
15
14
13
A
B
C
1
2
3
4
5
6
7
8
9
10
11
12

Section Views

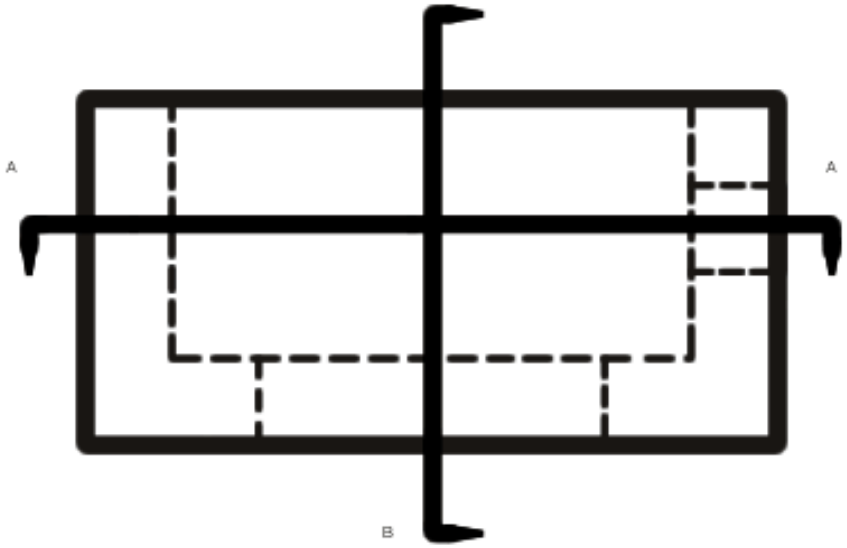
- Cutting Plane Lines





SECTION A-A

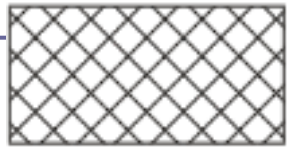
SECTION B-B



(A) Cast or malleable iron and general use for all materials

(B) Steel

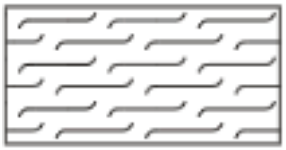
(C) Bronze, brass, copper and compositions



(D) White metal, zinc, lead, babbitt, and alloys

(E) Magnesium, aluminum, and aluminum alloys

(F) Rubber, plastic, and electrical insulation

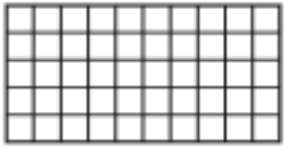


(G) Cork, felt, leather and fiber

(H) Sound insulation

(I) Thermal insulation

(J) Titanium and refractory material



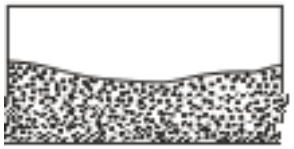
(K) Electric windings, electro-magnets, resistance, etc.

(L) Concrete

(M) Marble, slate, glass, porcelain, etc.

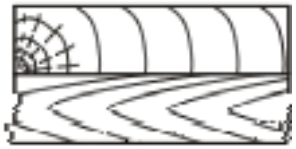
(N) Earth

(O) Rock



(P) Sand

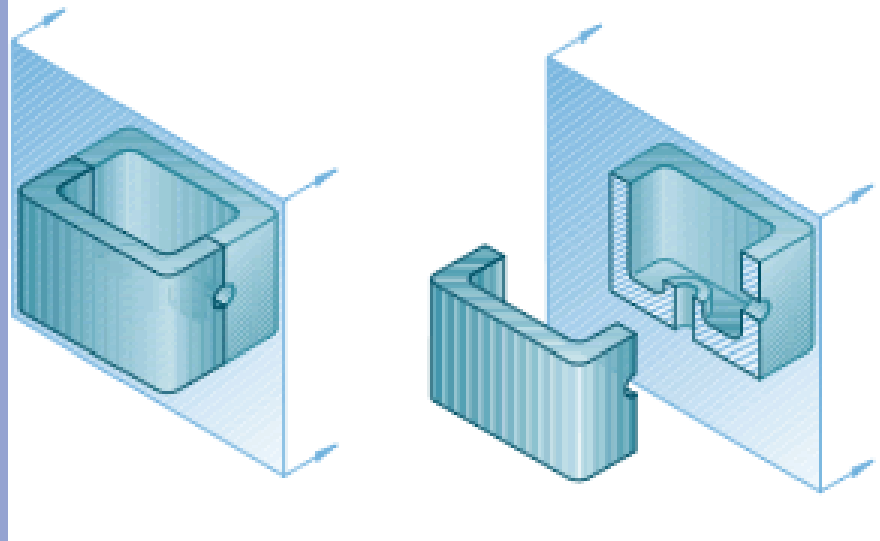
(Q) Water and other liquids



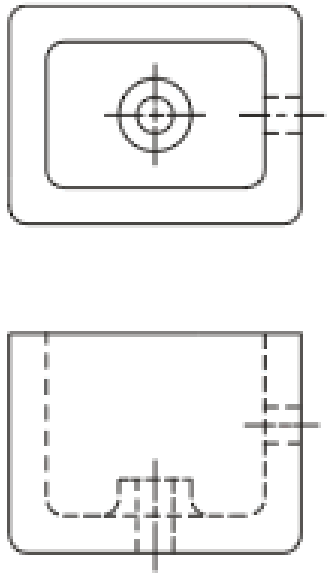
(R) Average grain

Section Views Types

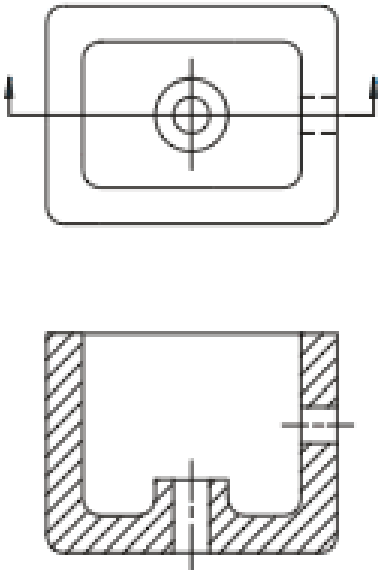
- Full Section
  - A **full section** view is made by passing an imaginary cutting plane fully through an object. The figure shows an imaginary cutting plane passing fully through an object and half of it being removed. In a multiview drawing, a full section view is placed in the same position that an unsectioned view would normally occupy; that is, a front section view would replace the traditional front view.



(A) Full section



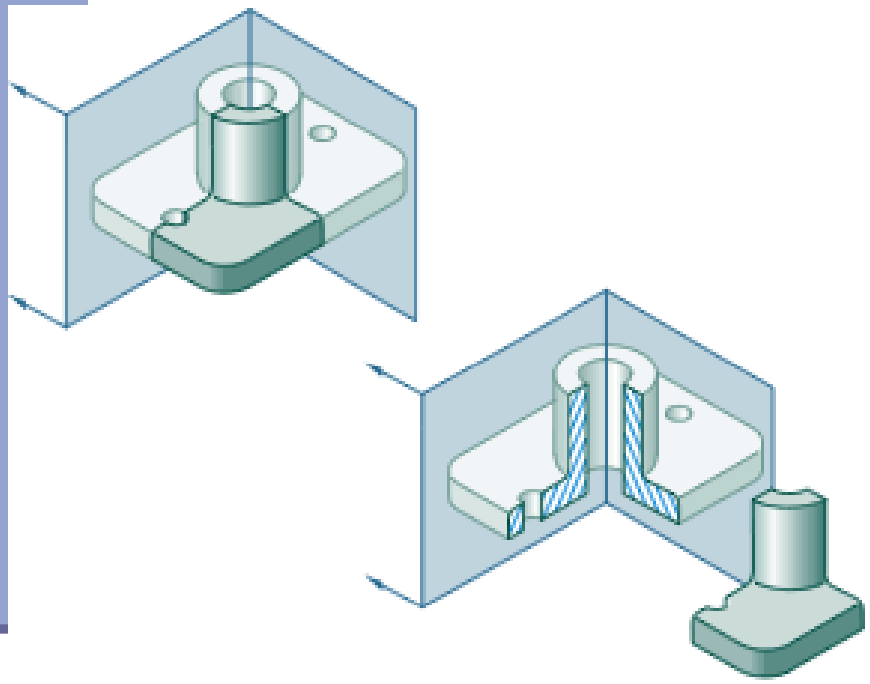
(B) Standard multiview



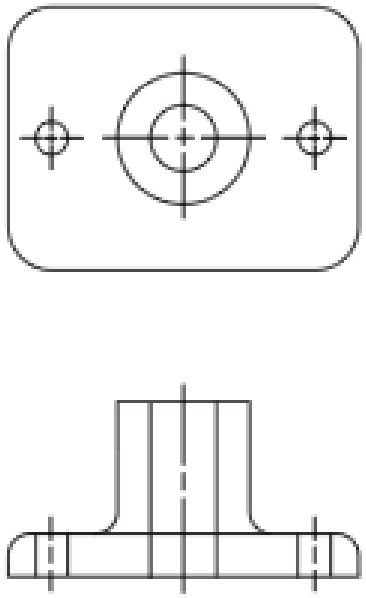
(C) Full section view

Section Views Types

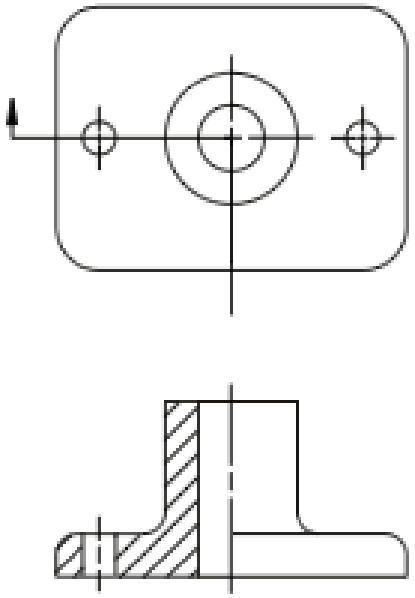
- Half section
  - **Half sections** are created by passing an imaginary cutting plane halfway through an object and one quarter of it is removed. Hidden lines are omitted on both halves of the section view. External features of the part are drawn on the unsectioned half of the view. A center line, not an object line, is used to separate the sectioned half from the unsectioned half of the view. Half section views are most often used on parts that are symmetrical, such as cylinders.



(A) Half section



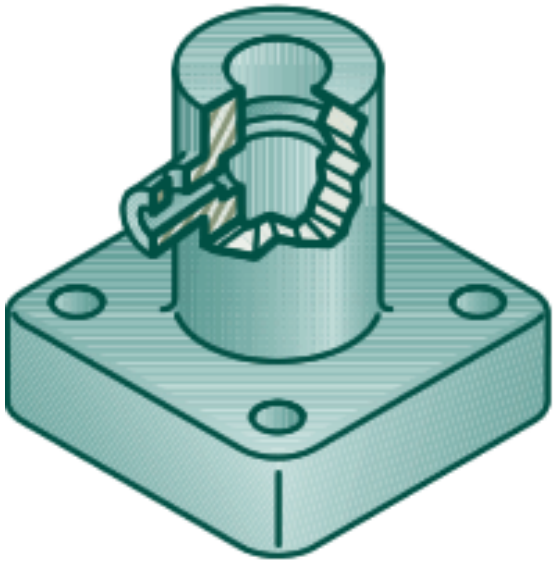
(B) Multiview



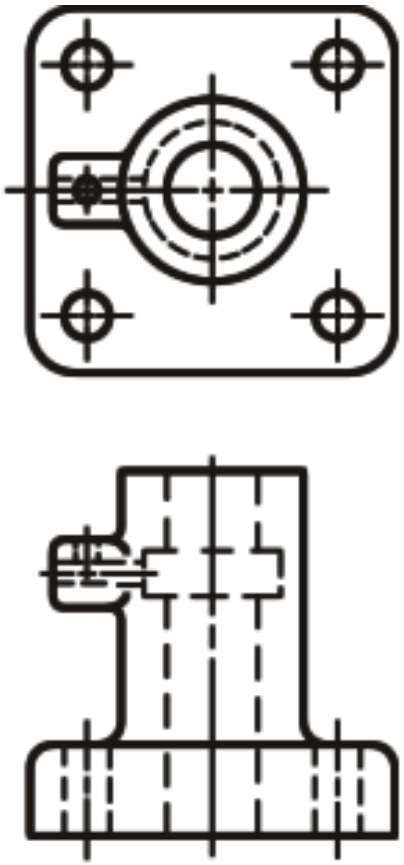
(C) Half section view

Section Views Types

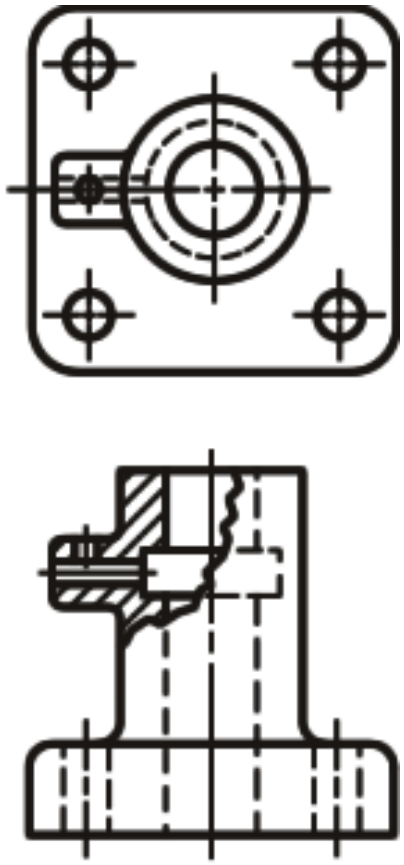
- Broken-out section
  - A **broken-out section** is used to show interior features of a part by breaking away some of the object. A broken-out section is used instead of a half or full section view to save time. A break line separates the sectioned from un-sectioned half of the view. A break line is drawn free-hand to represent the jagged edge of the break. No cutting plane line is drawn with a broken-out section view.



(A) Broken-out section



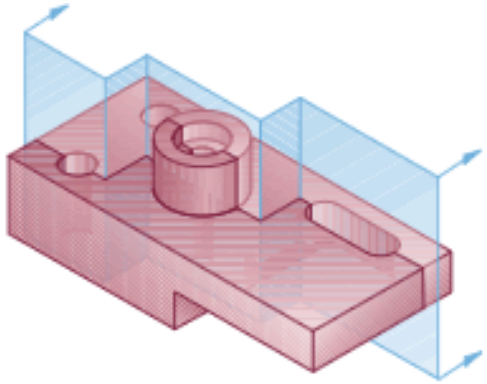
(B) Multiview

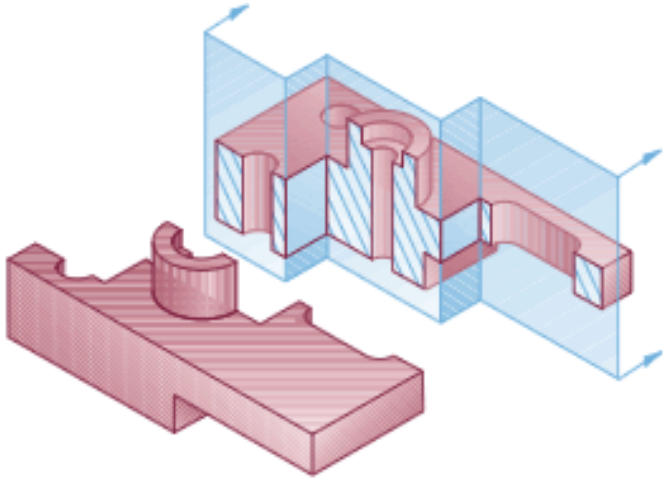


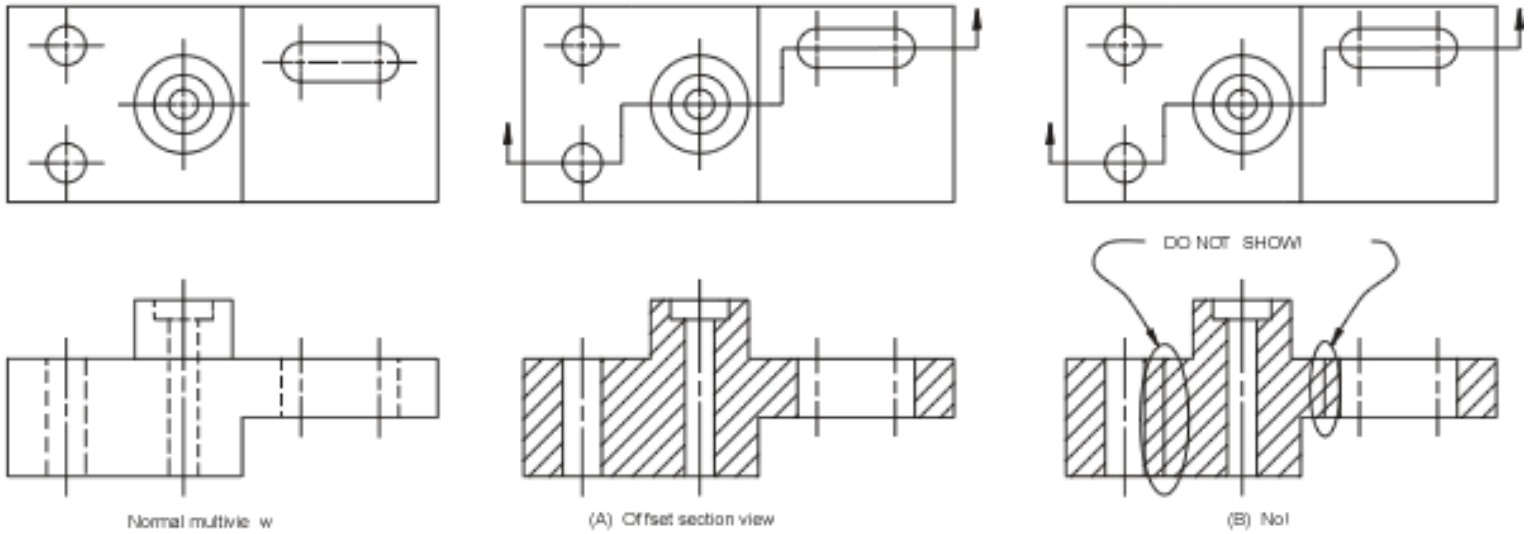
(C) Broken-out section view

Section Views Types

- Offset Sections
  - An **offset section** has its cutting plane bent at 90 degree angles to pass through important features. Offset sections are used for complex parts that have a number of important features that cannot be sectioned using a straight cutting plane. The cutting plane is bent at 90 degrees to pass through the hole, then bent 90 degrees again to pass through the slot.






DO NOT SHOW
Normal multivie w
(A) Offset section view
(B) No!