

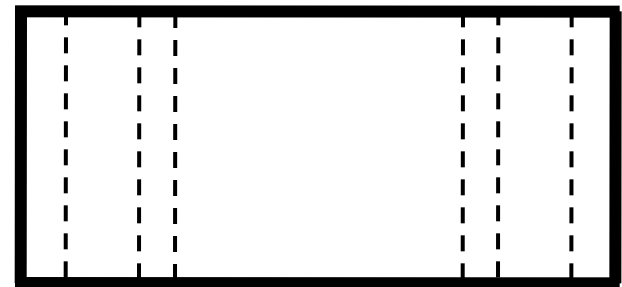
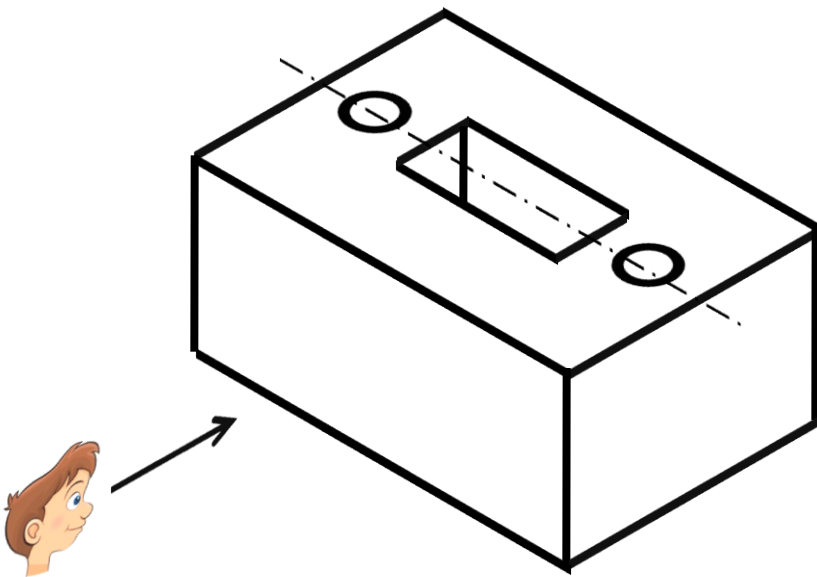
# **ENGINEERING DRAWING**

## **Topic:** **Sectioning**

[https://www.youtube.com/watch?v=K\\_2uJPkCv0Y](https://www.youtube.com/watch?v=K_2uJPkCv0Y)

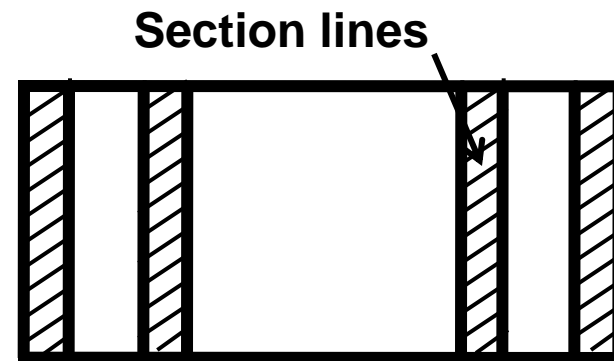
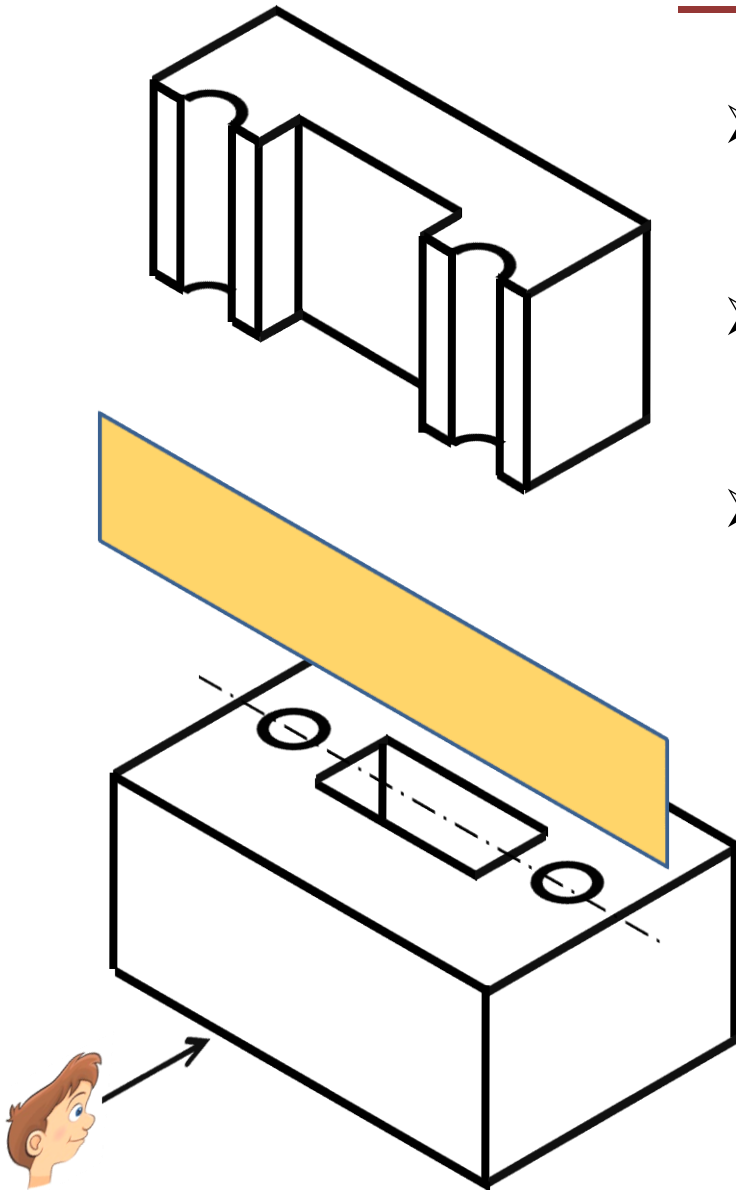
# Sectioning

- The detail of an object can be shown by drawing a limited number of carefully chosen views and showing external features of the object by firm lines and invisible detail by hidden lines.
- But when the interior of the object is complicated then the method of showing interior details by hidden lines makes the view confusing and hard to read.



# Sectioning

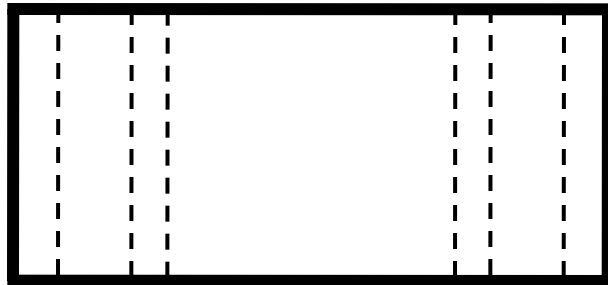
- In such cases the object is assumed to be cut by an imaginary plane from a particular section.
- The part of the object in between the observer and the cutting plane is removed to expose the hidden detail of the object.
- The cut surfaces are identified by drawing section lines and the view thus obtained is called the “Sectional View” or “View in Section” of the remaining object.



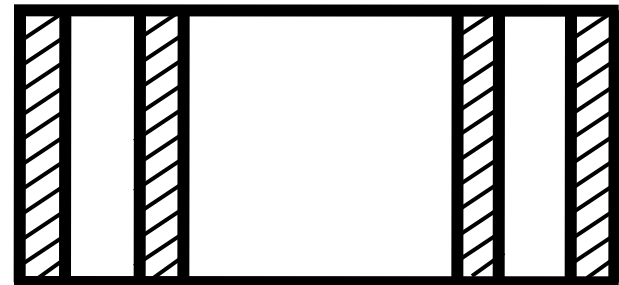
**Sectional View**

# Purpose of Sectioning

- To clarify the internal detail of the object by reducing or eliminating the hidden lines from the view.



**Front View**

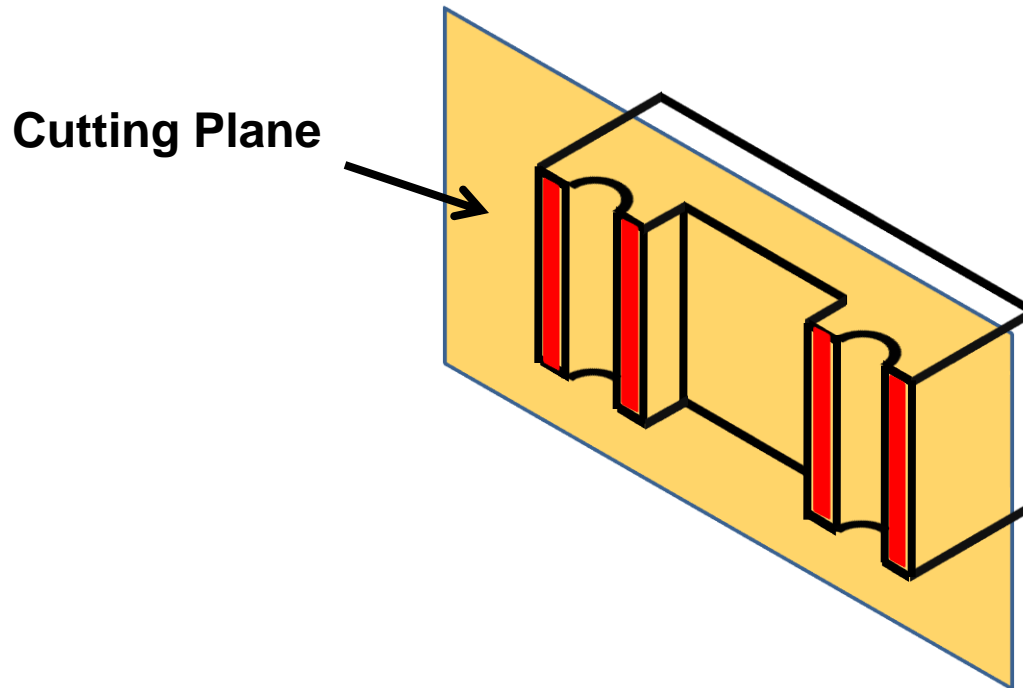


**Sectional Front View**

# Terminology

➤ Cutting Plane:

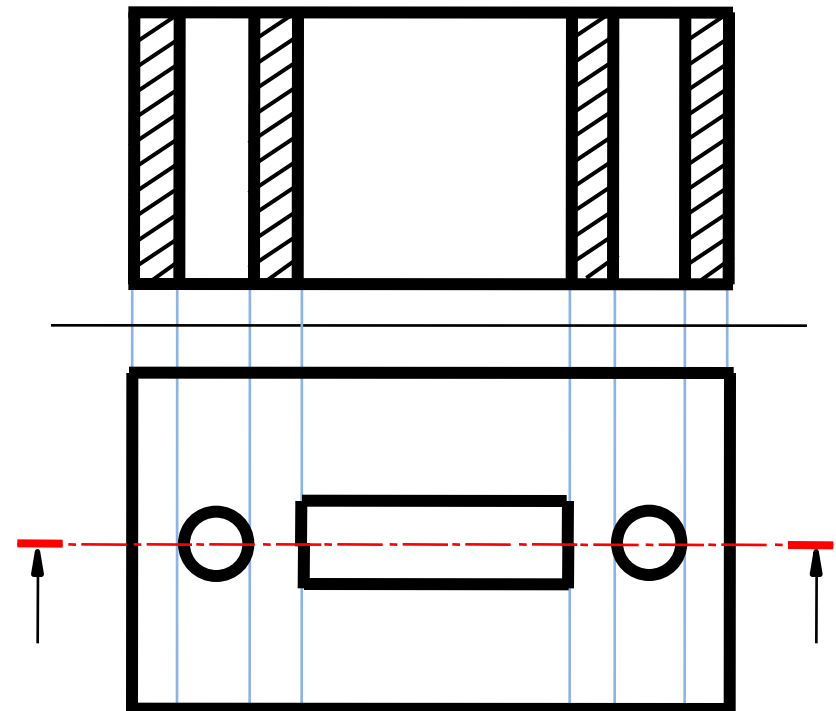
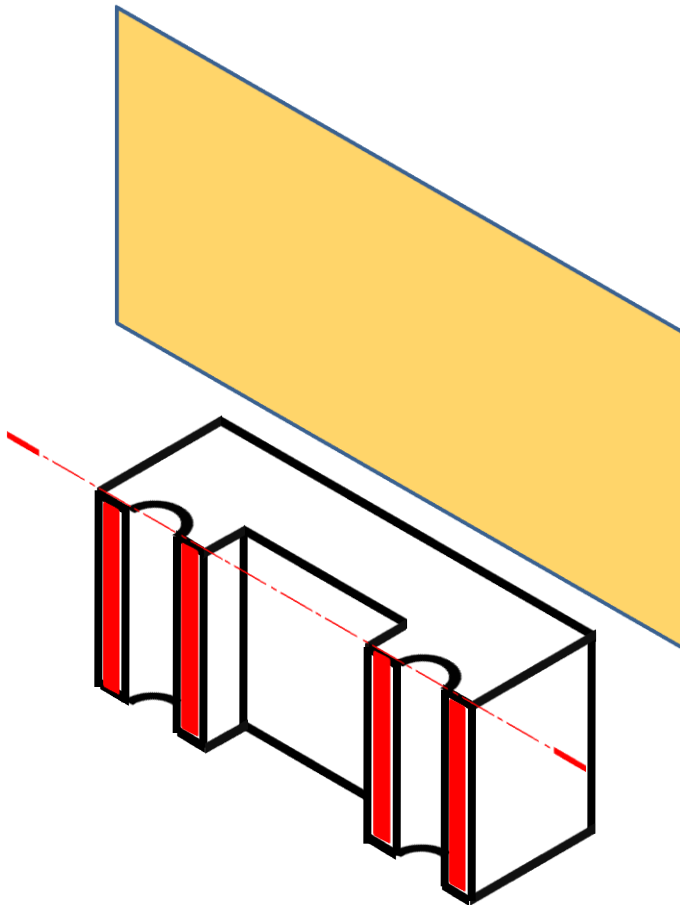
It is a plane that imaginarily cuts the object to reveal the internal features.



# Terminology

## ➤ Cutting Plane Line:

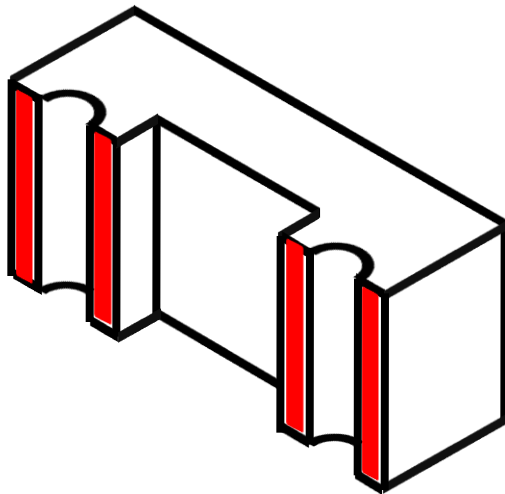
It is an edge view of the cutting plane used to indicate where the imaginary cutting of the object takes place.



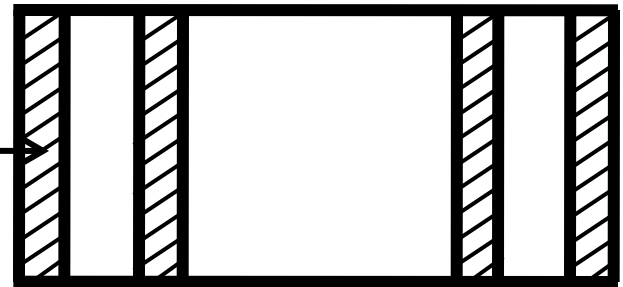
# Terminology

## ➤ Section Lines:

In a sectional view, wherever the material has been cut by the cutting plane, to make the cut surface distinct, a conventional scheme called section lines or cross hatching is employed.



Section lines



# Terminology

## ➤ Section Lines:

- Section lines are different for each of material's type.
- For practical purpose, the case iron symbol is used most often for any materials.



Cast iron



Concrete



Steel



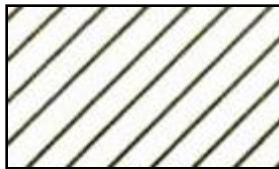
Wood



# Terminology

## ➤ Section Lines:

- Section lines are different for each of material's type.
- For practical purpose, the case iron symbol is used most often for any materials.



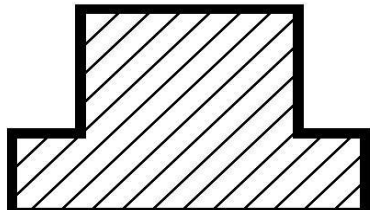
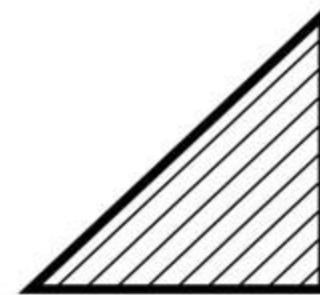
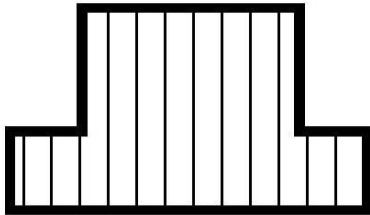
Cast iron

1. 45° angle with horizontal
2. Equidistant (2-3 mm gap)
3. Parallel lines

# Terminology

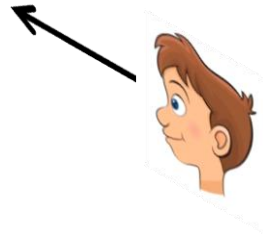
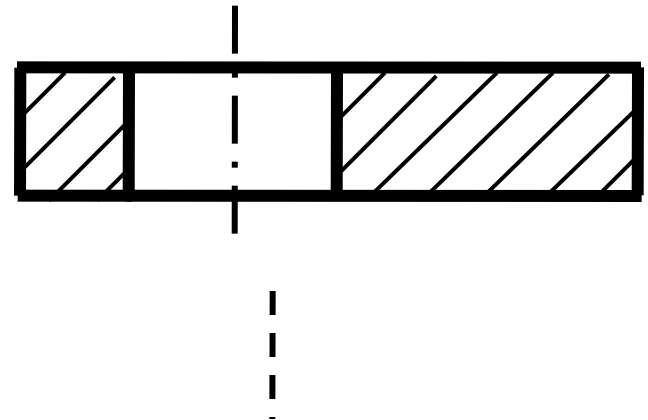
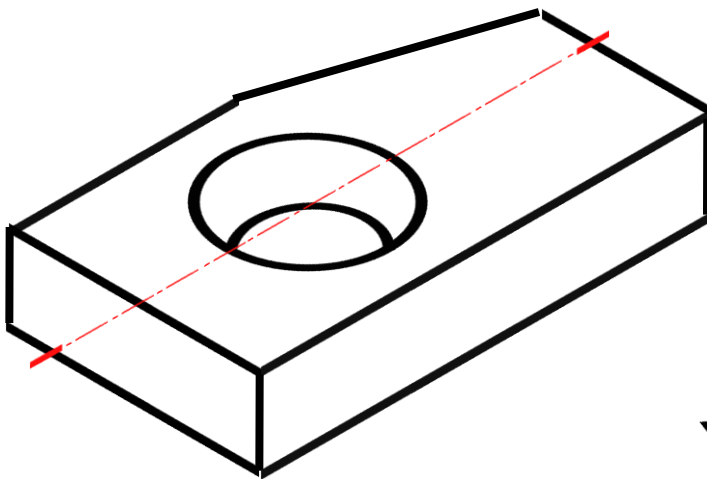
## ➤ Section Lines:

- Lines should never be parallel or perpendicular to object lines.
- If the object line is at  $45^\circ$  then,  $30^\circ$  or  $60^\circ$  angle can be used for section lines.



# Treatment of hidden lines

- Hidden lines are normally omitted from the section views.

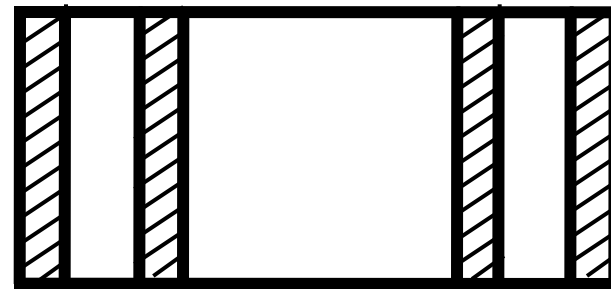
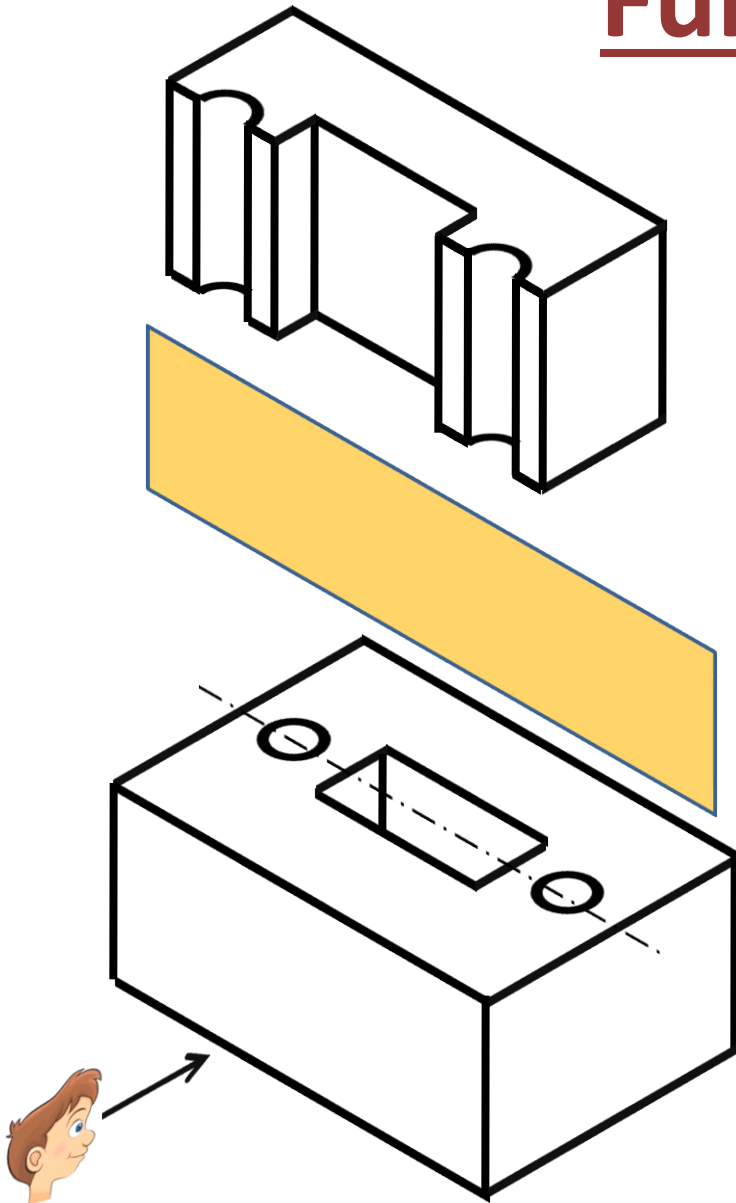


# Types of Section

- **Full Section**
- **Half Section**
- **Offset Section**

# Full Section

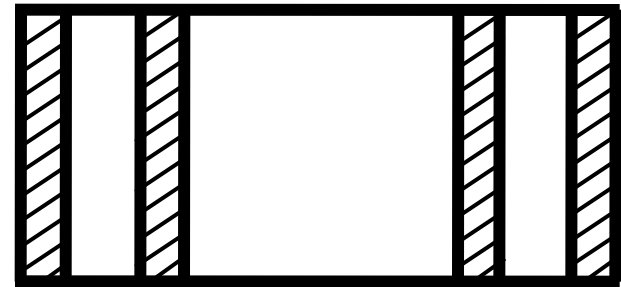
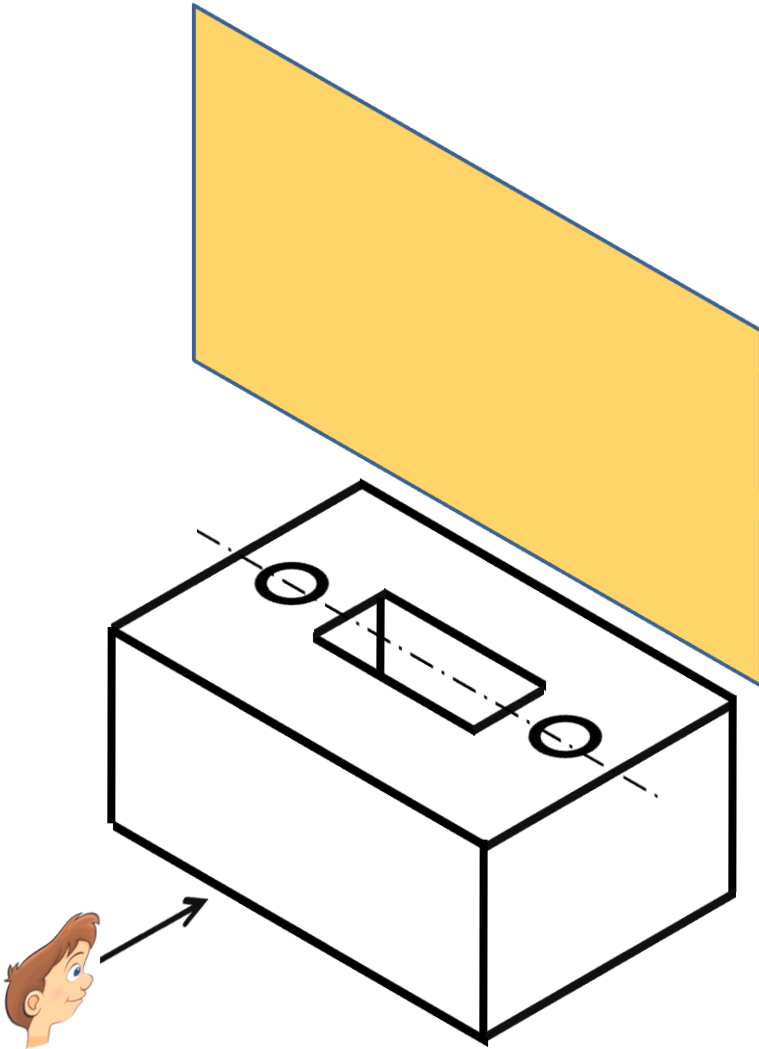
- When the cutting plane passes entirely through the object, in a straight line the view obtained is called full section of the object.
- If the object is symmetric then this method will divide the object into two identical parts.



Full Section View

# Full Section

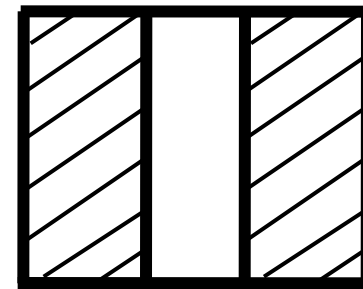
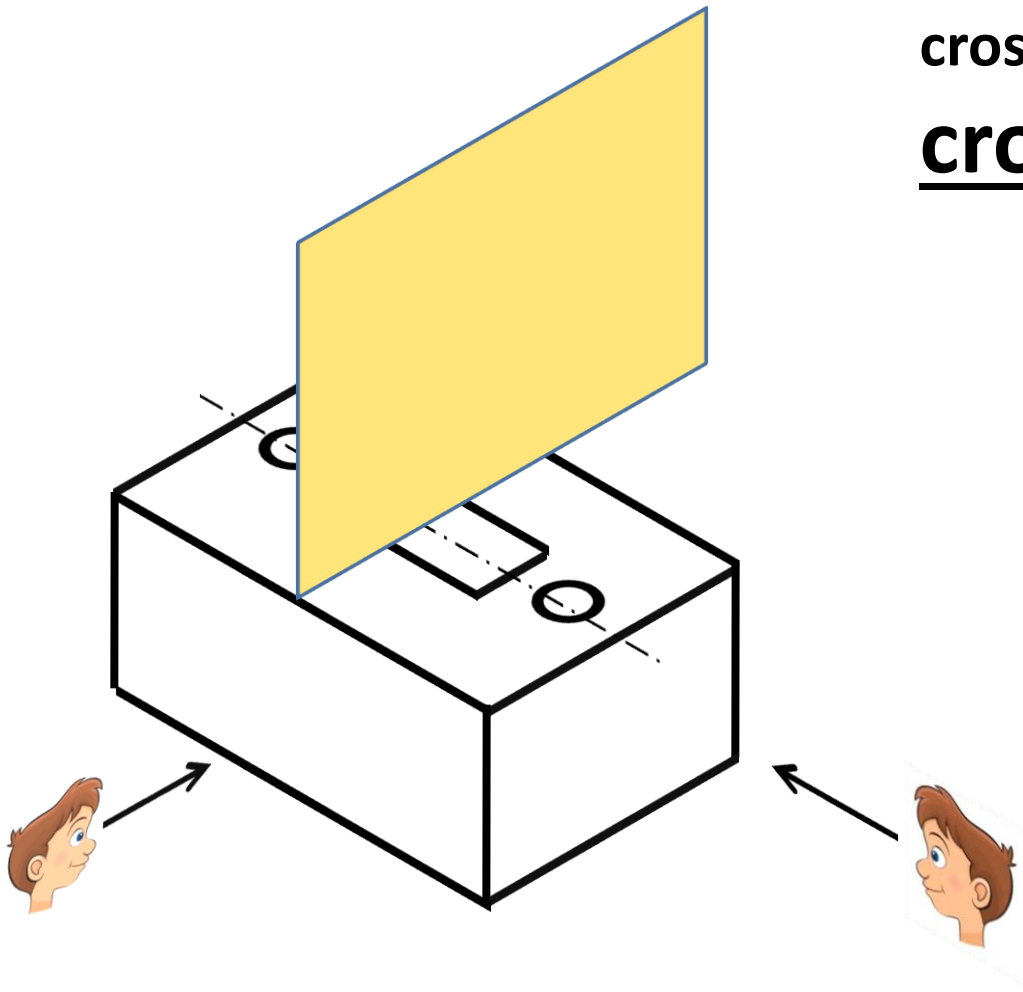
- When the object is sectioned along its length, it is called a longitudinal section.



Full Section View  
(Longitudinal Section)

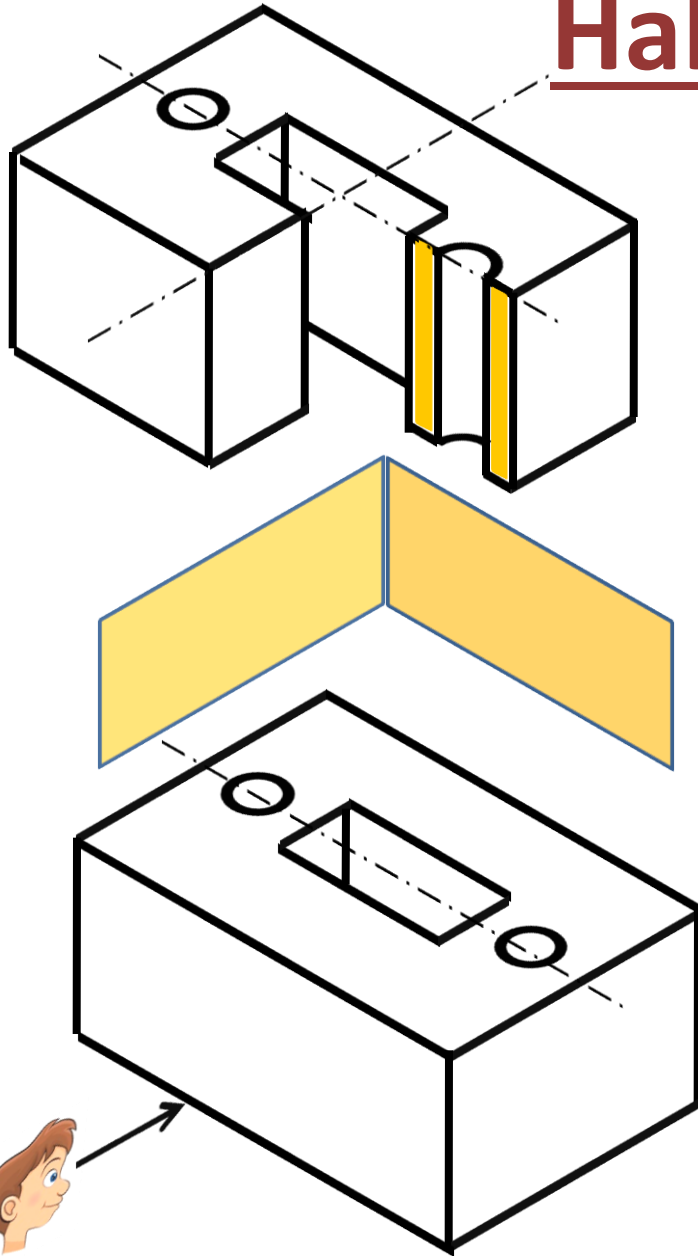
# Full Section

- When the object is sectioned crosswise, the section is called a cross section.

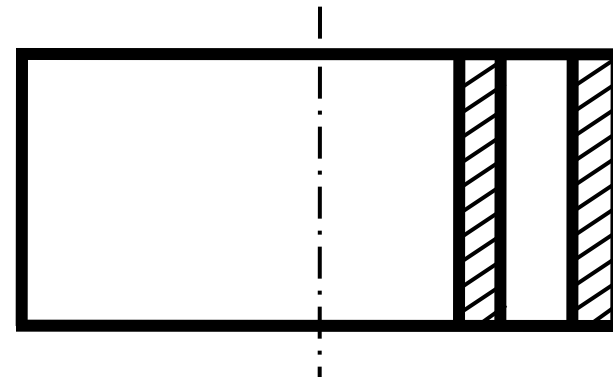


Full Section View  
(Cross Section)

# Half Section



- In symmetrical objects, to show the interior and exterior details in the same view, half sections are drawn.
- Two cutting planes ( $90^\circ$  to each other) are used to cut the object from two center lines to remove quarter portion of the object.

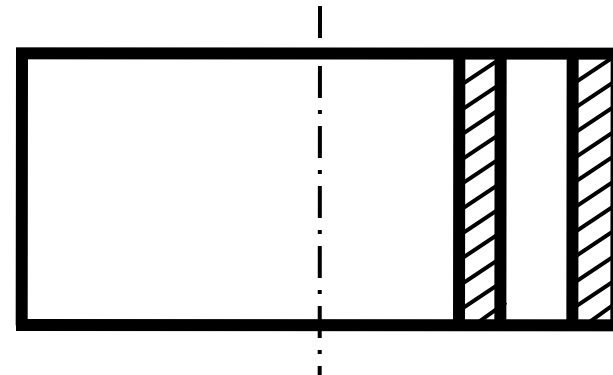
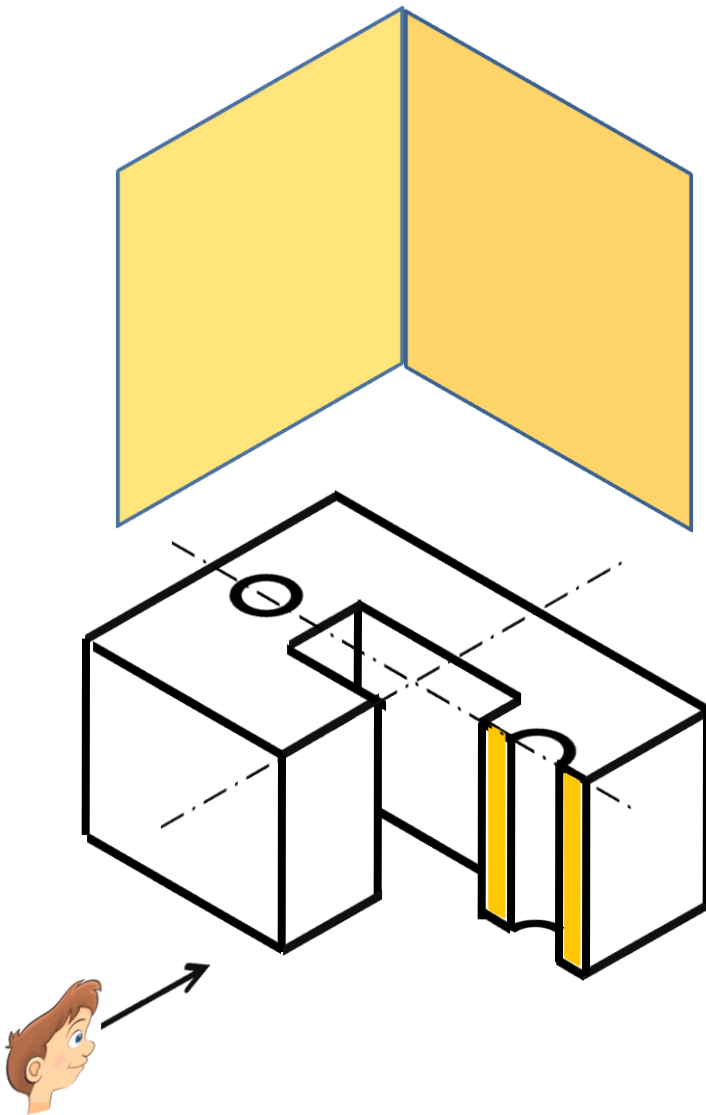


Half Section View



# Half Section

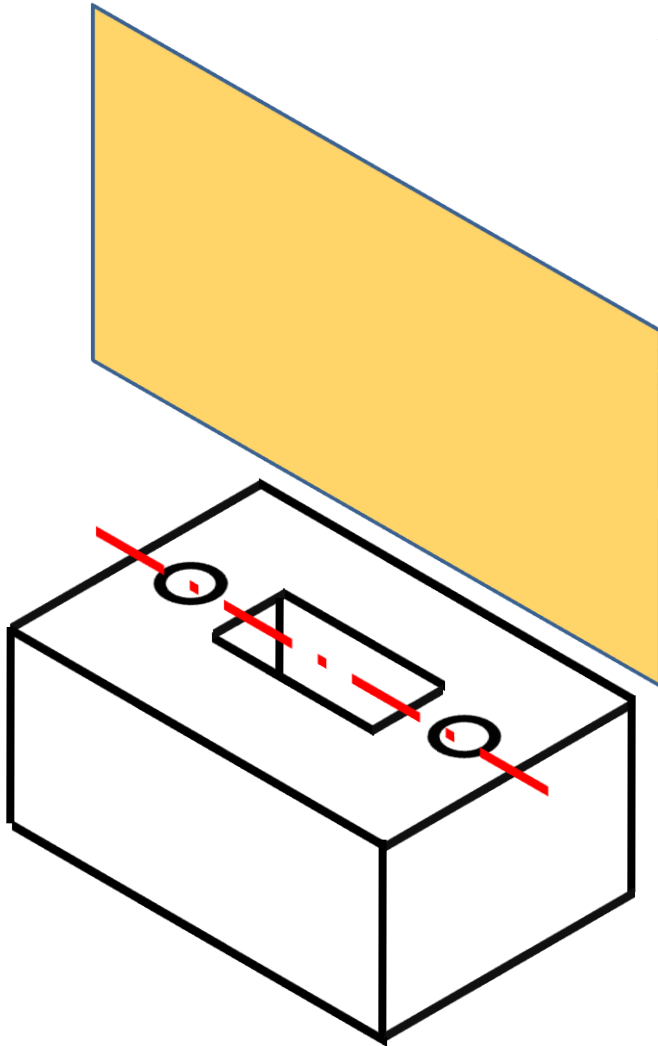
- The hidden lines may be omitted in both halves of the view, unless they are needed for dimensioning.
- The two parts of the half section view are separated only by the center line as the object is only imagined to be cut and no actual cutting edge exists.



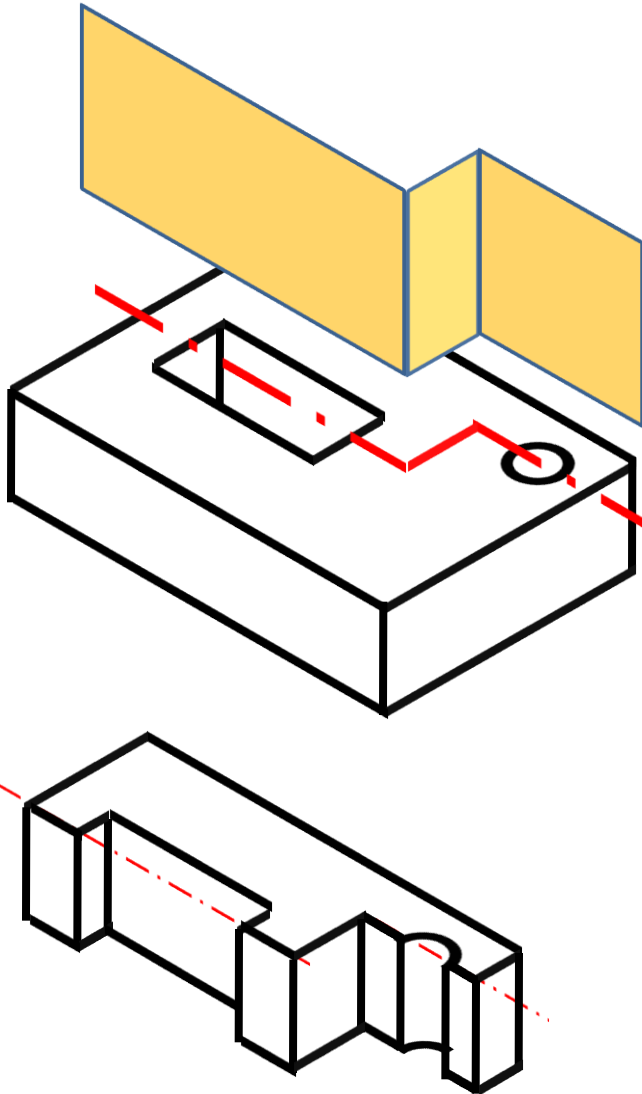
Half Section View

# Off-set Section

- In full section, the cutting plane is usually taken straight and is made to pass through the center of the object.



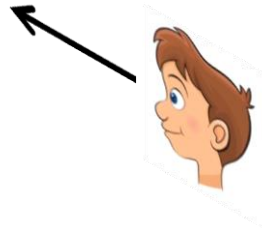
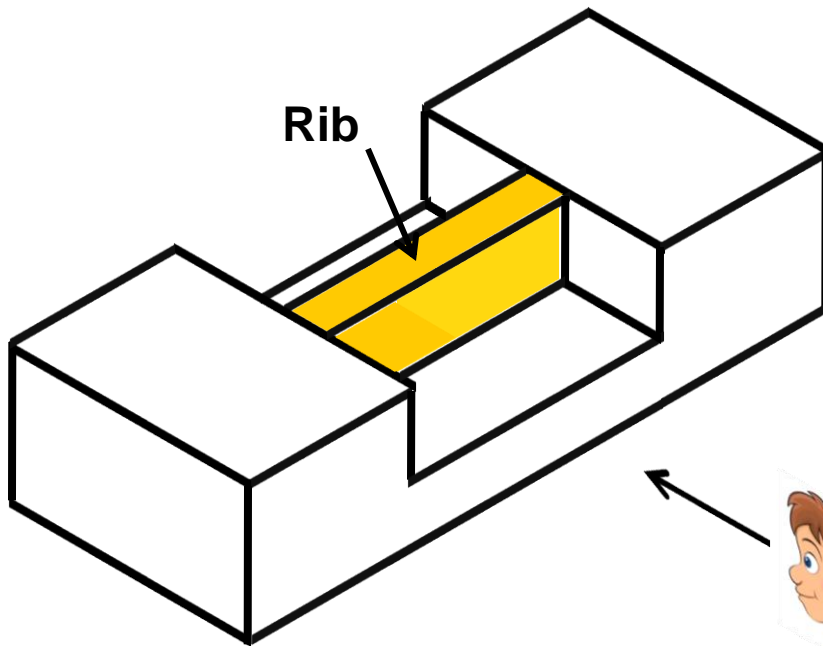
# Off-set Section



- In full section, the cutting plane is usually taken straight and is made to pass through the center of the object.
- But in some objects, when this cutting plane does not expose the required details, or it passes through features which should not be sectioned, it is off-set by changing the direction and is made to pass through required details that need to be shown in section.
- For this purpose two or more cutting planes are used.

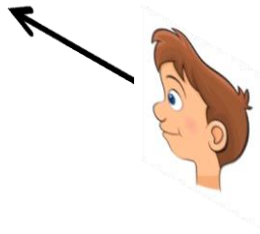
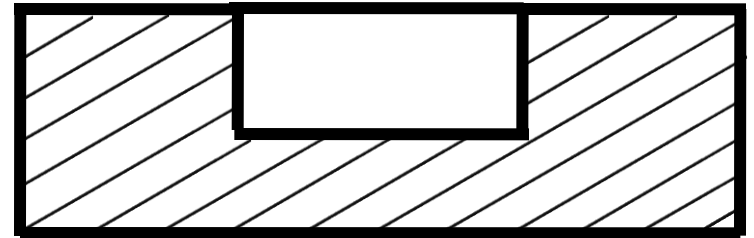
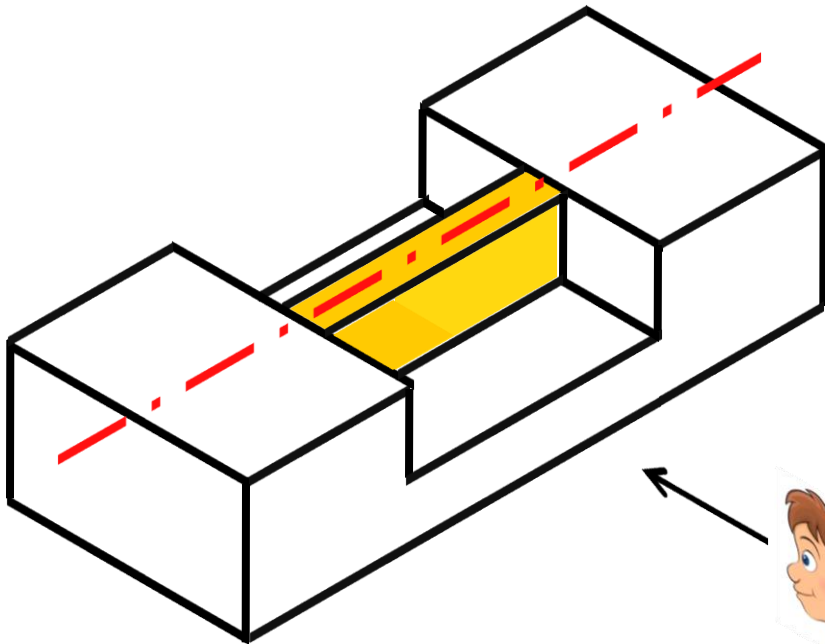
# Ribs

- It is a thin plate that acts as a support for other plates and provides rigidity to the object.



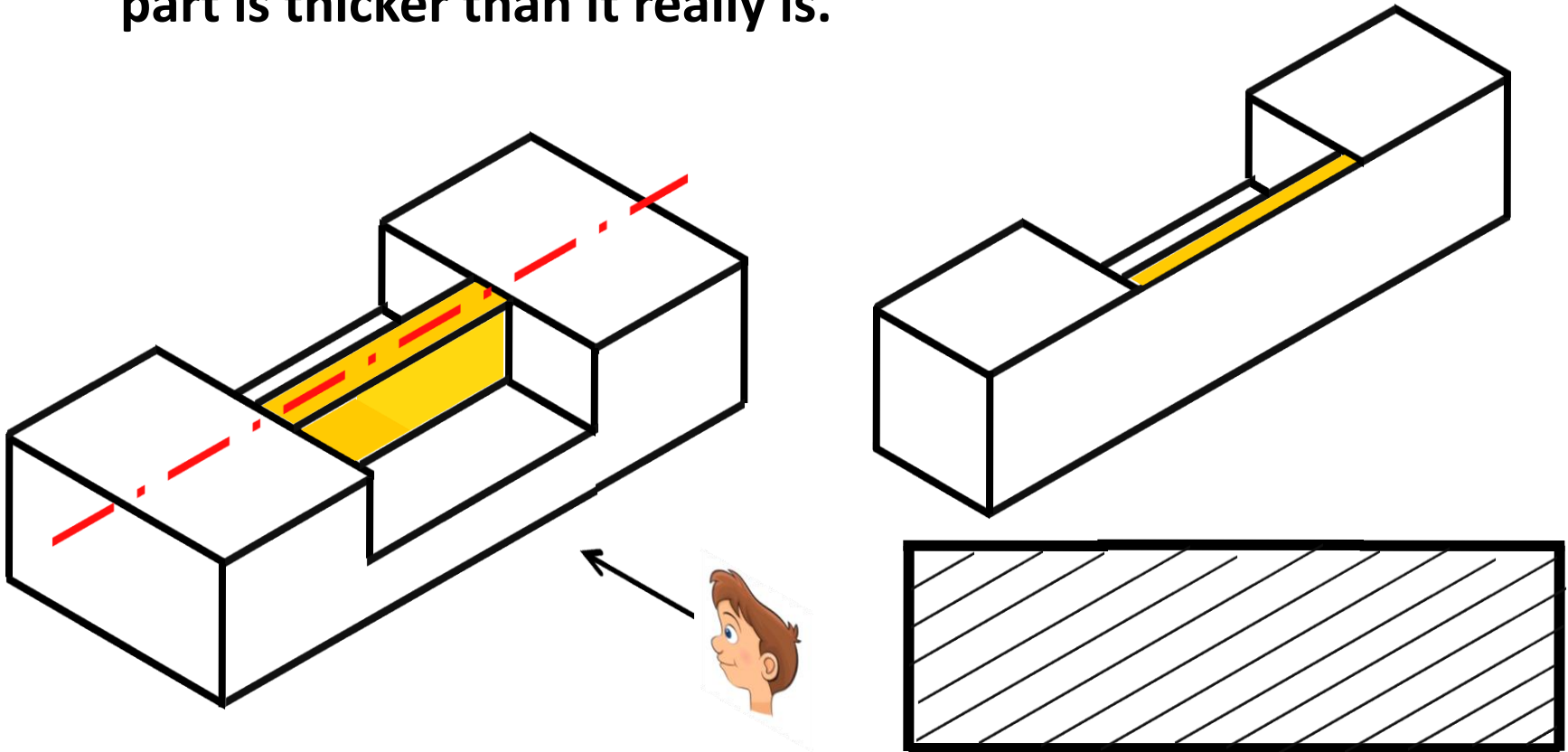
# Ribs

- Section lines are not placed in the ribs even if they are cut by the cutting plane.



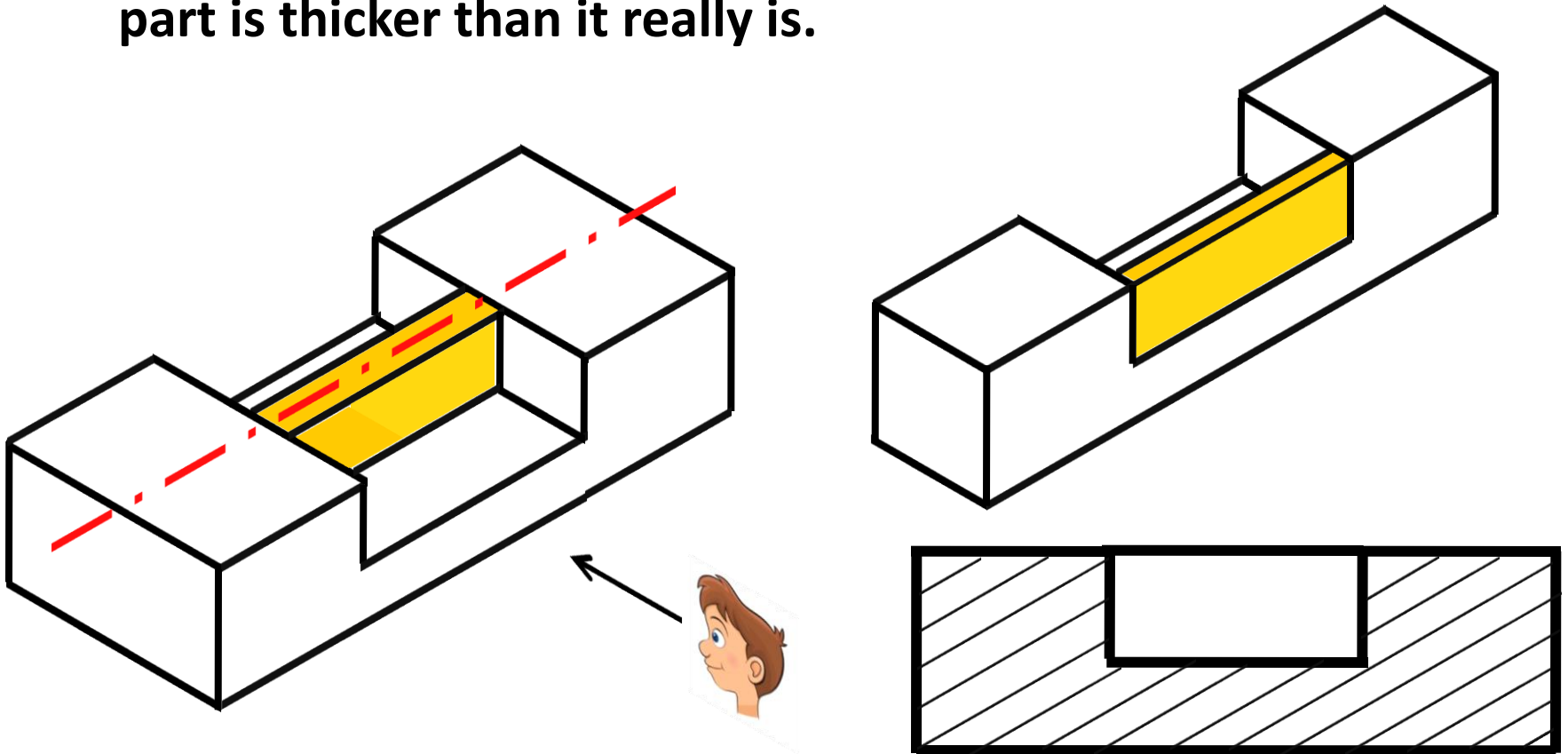
# Ribs

- Section lines are not placed in the ribs even if they are cut by the cutting plane.
- Otherwise these would give the false impression that the part is thicker than it really is.

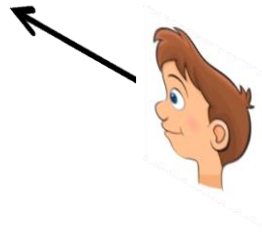
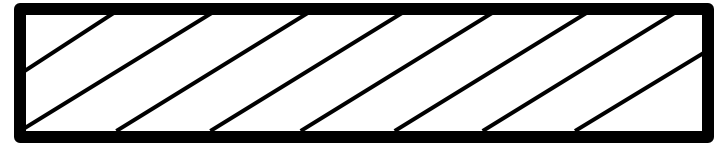
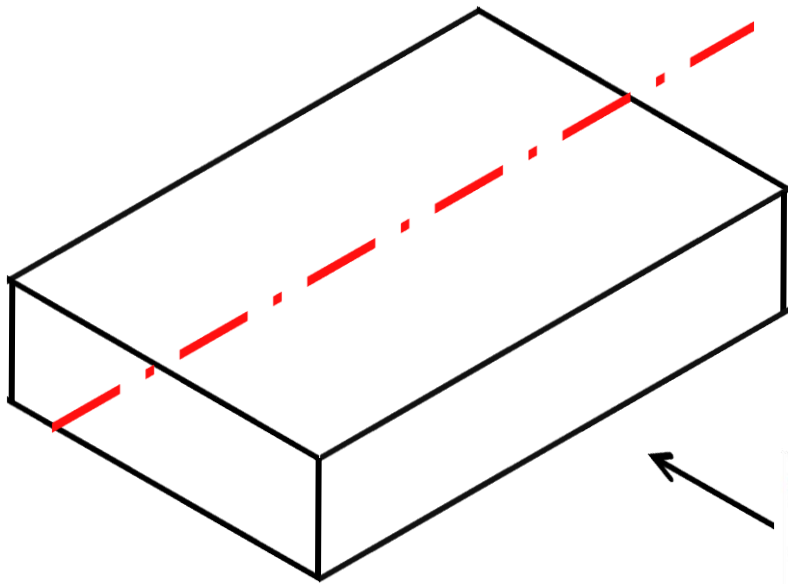


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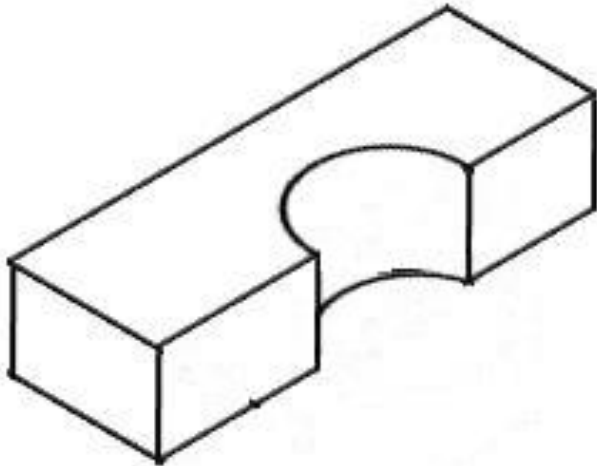
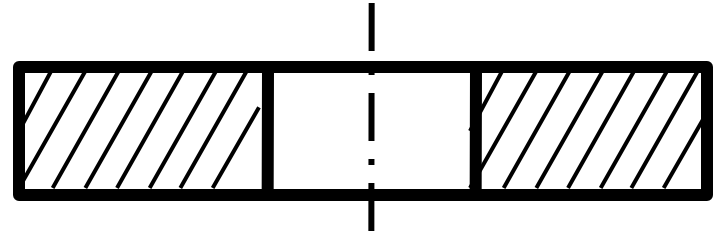
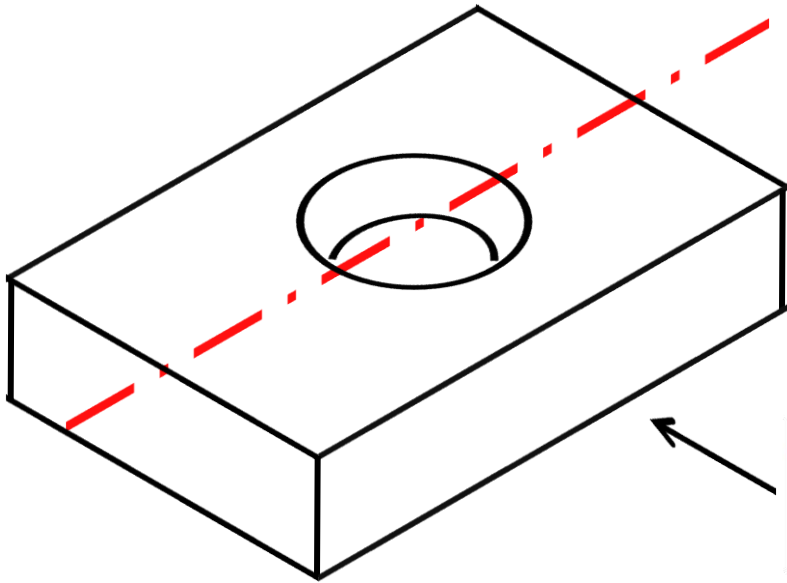


# Practice

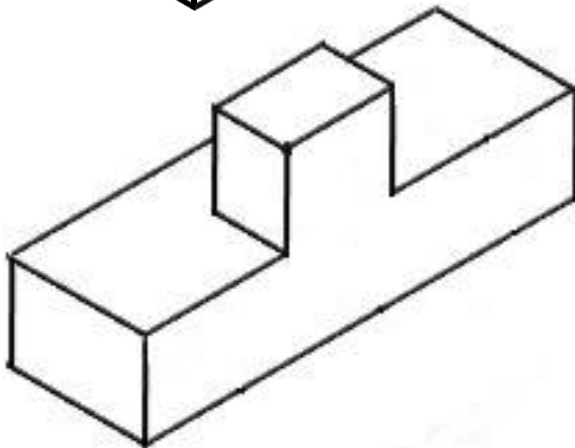
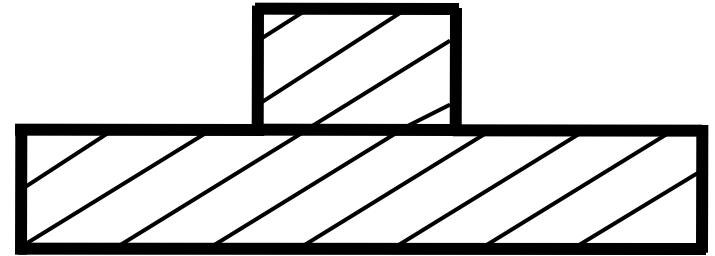
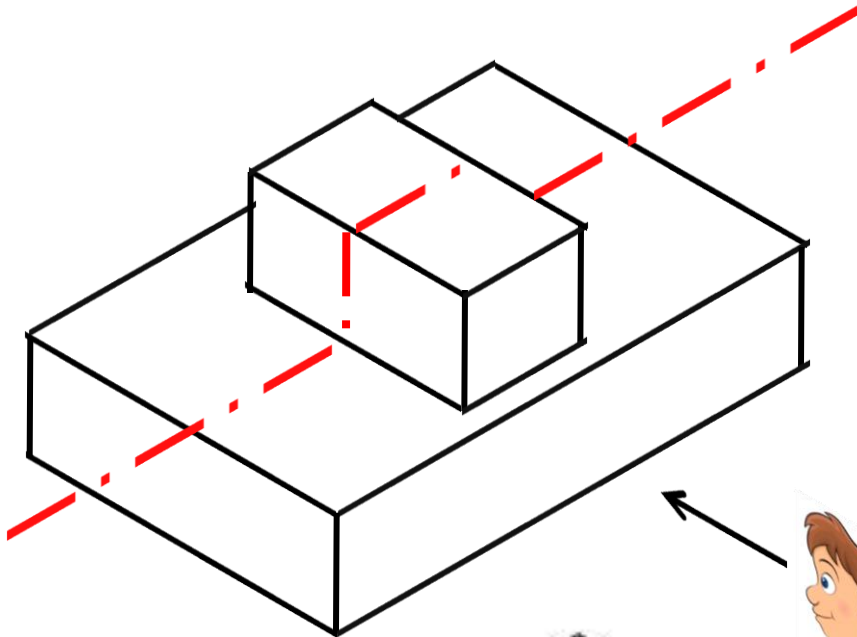




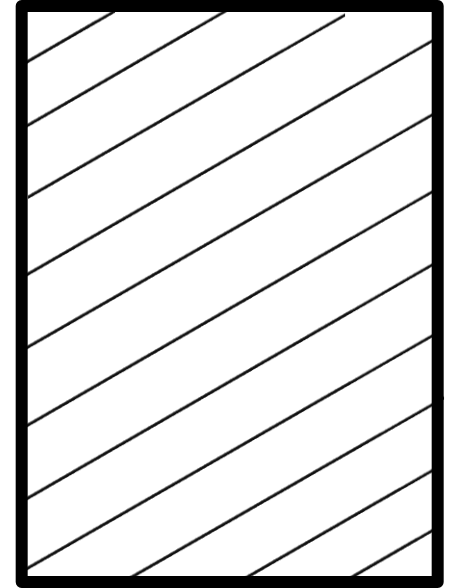
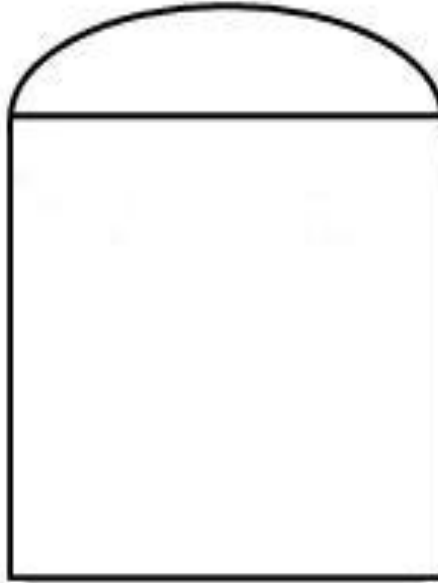
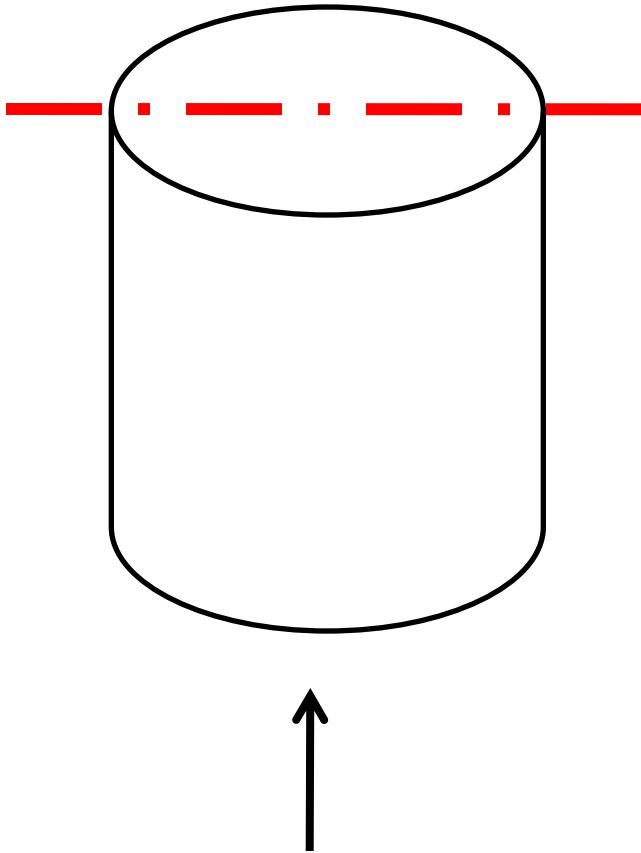
# Practice



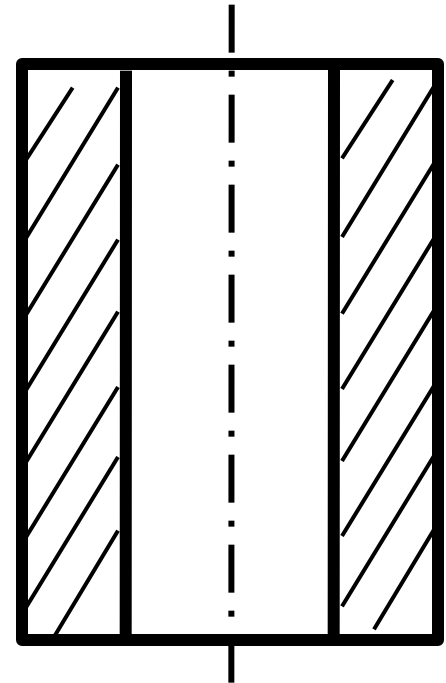
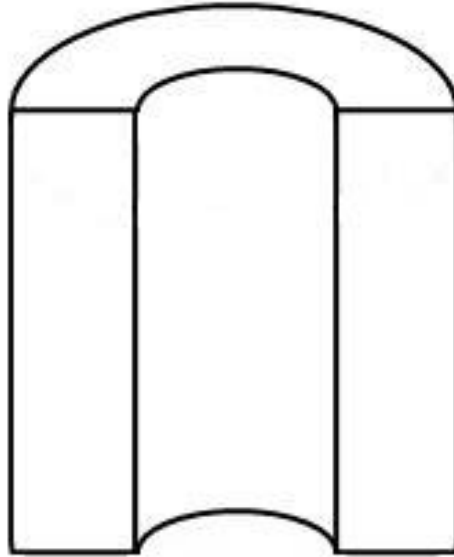
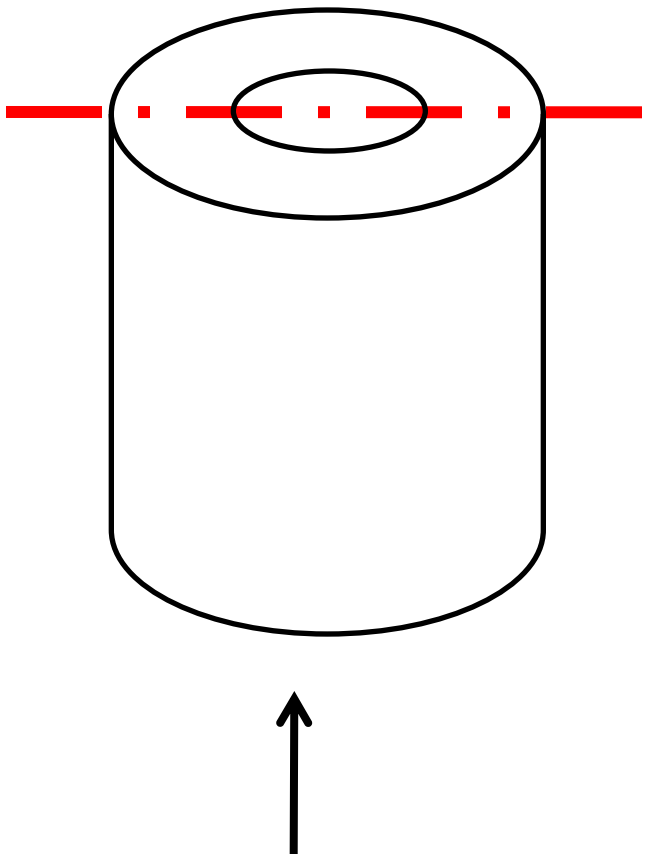
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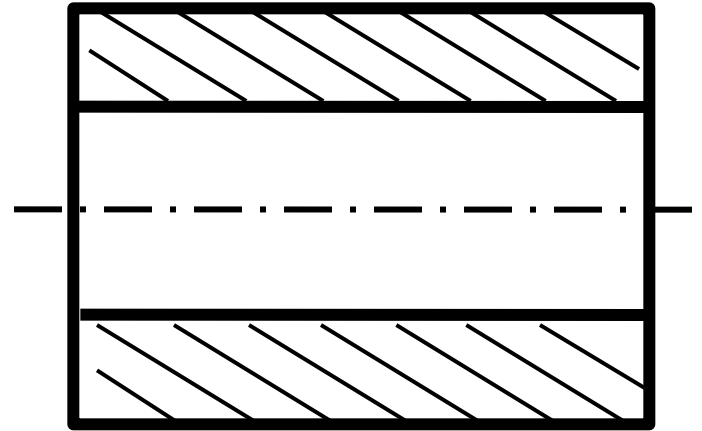
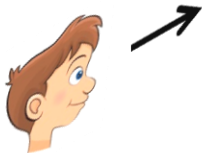
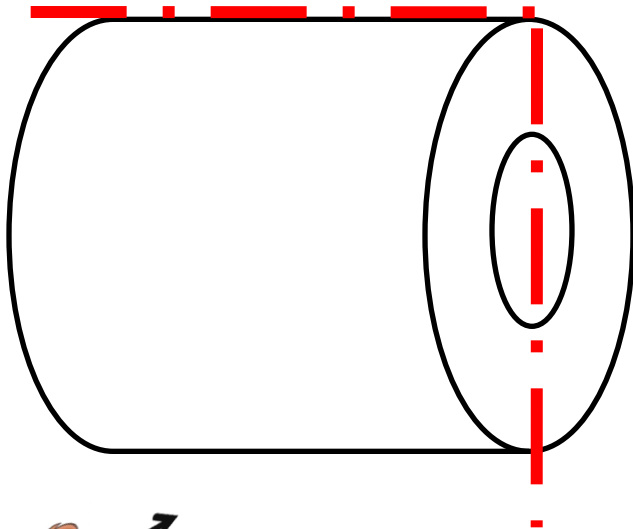
# Practice



# Practice



# Practice



**Thanks**