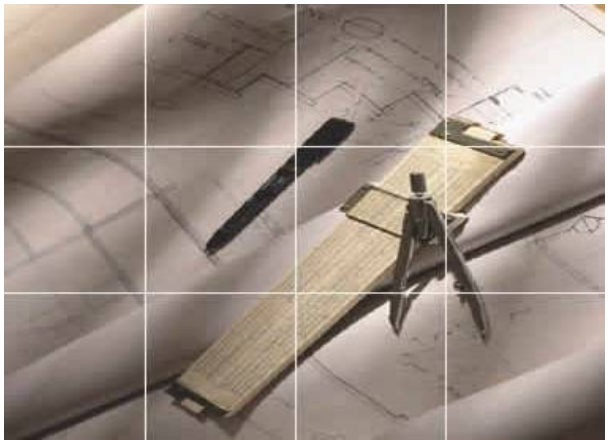
# Chapter 4

# Orthographic Writing







# Contents

- Orthographic writing
  - Overall steps
  - Suggestions on a view selection
- Additional examples on a view selection
- Alignment of views (Projection systems)
- Basic dimensioning
- Primary auxiliary view

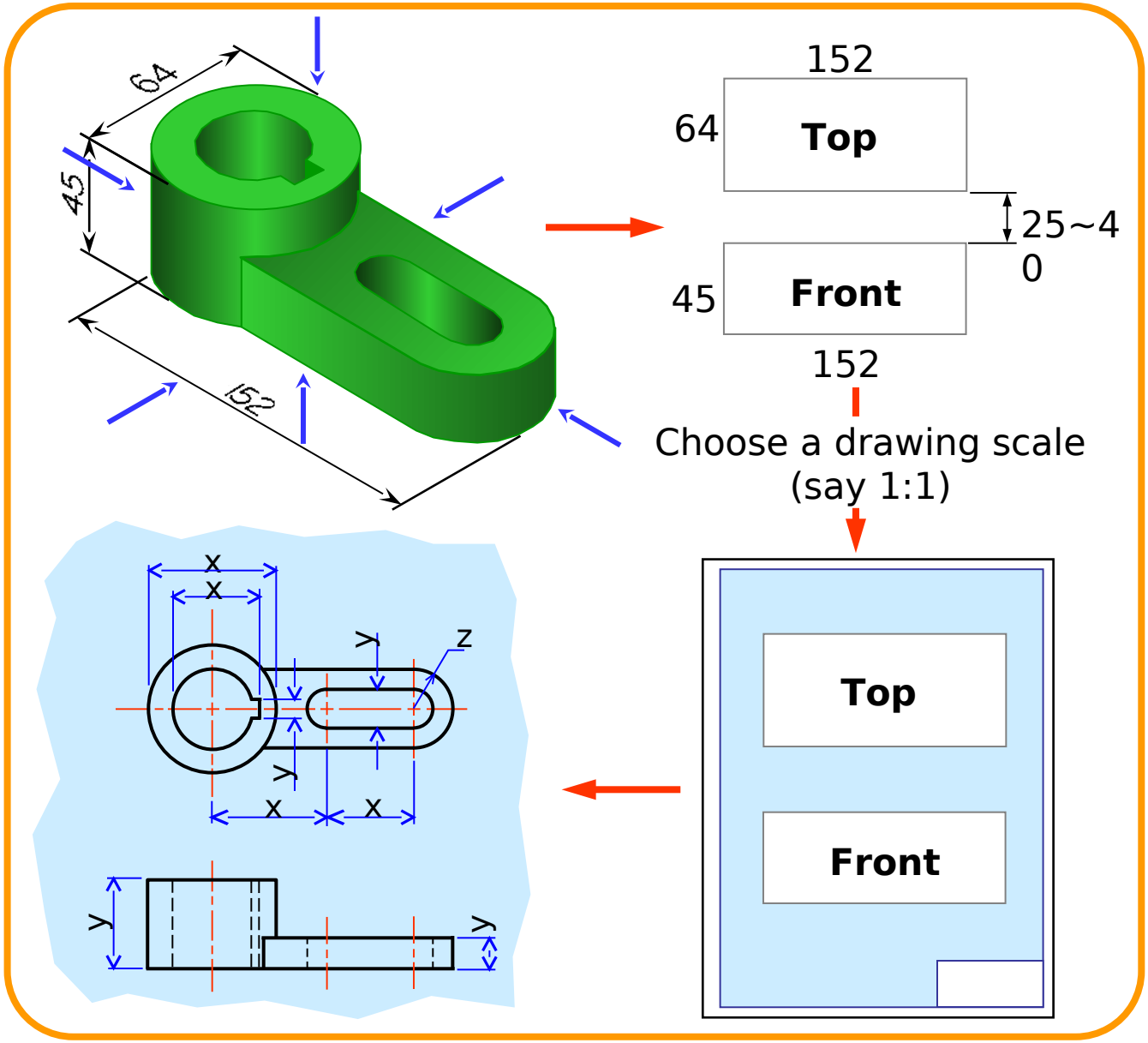



# Orthographic writing

Contents

# Overall steps

1. Select the necessary views
2. Layout the selected views on a drawing sheet.
3. Complete each selected views.
4. Complete the dimensions and notes.



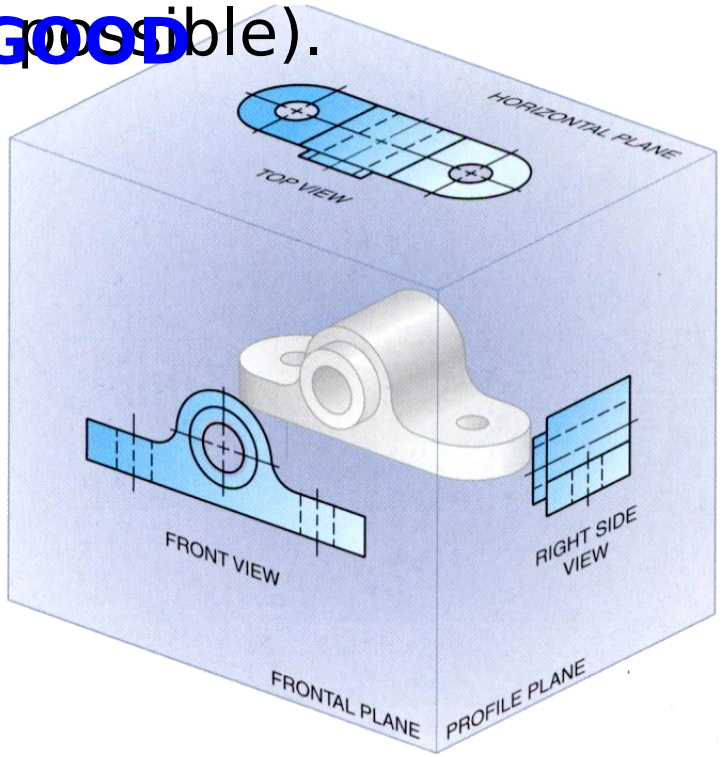
# View selection procedures

1. Orient the object to the best position relative to
   a glass box.
2. Select the front view.
3. Select adjacent views.

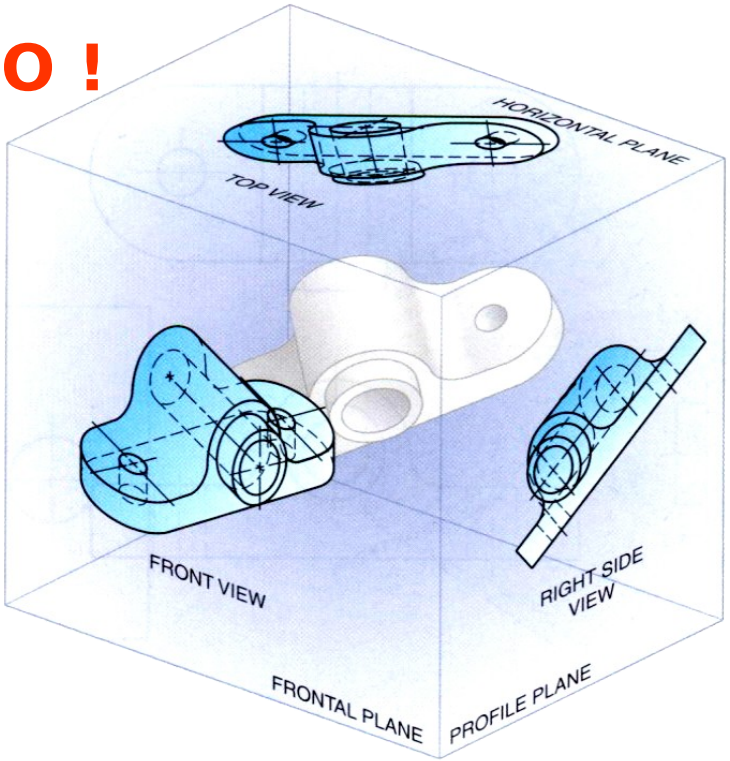
# Suggestions : Orient the object

1. The object should be placed in its **natural position**.
2. The orthographic views should represent the **true size** and **true shape** of an object (as much as possible).

**GOOD**




**NO !**



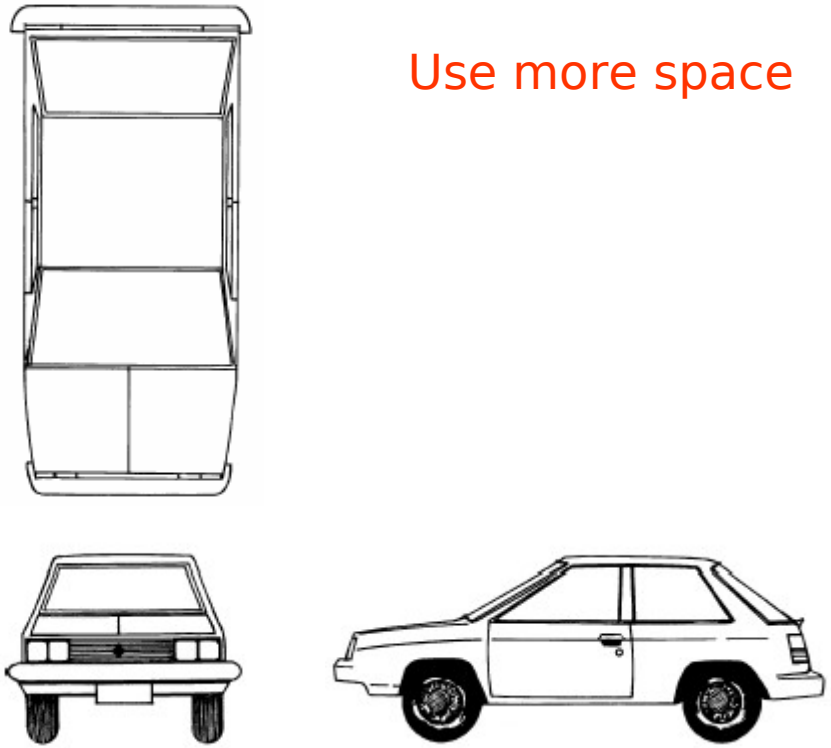
# Suggestions : Select the front view

1. The **longest** dimension of an object should be presented

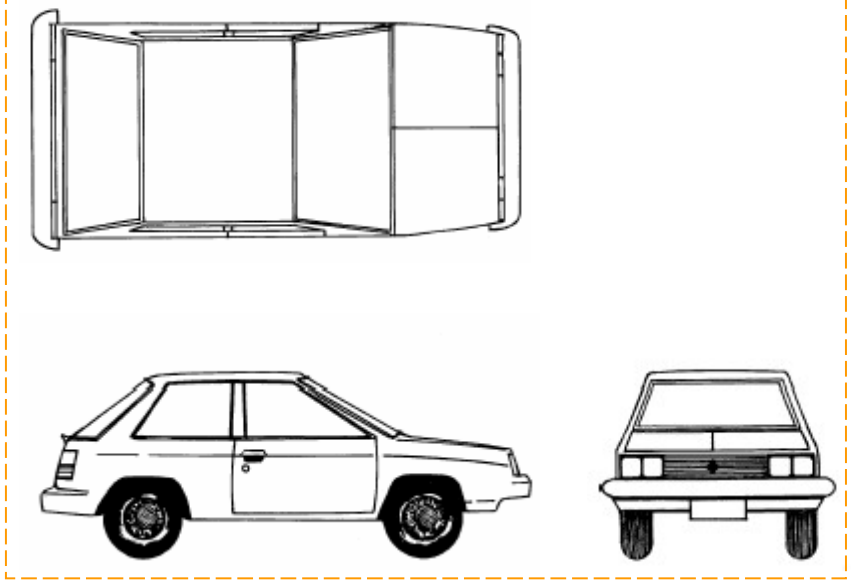
as a **width** (in a front view).

**First choice** **Inappropriate**

Use more space



**Second choice** **Good**

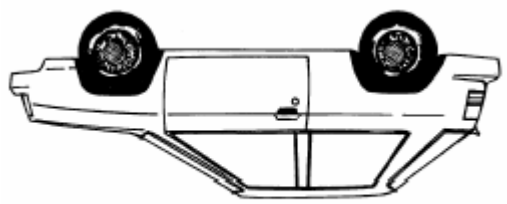


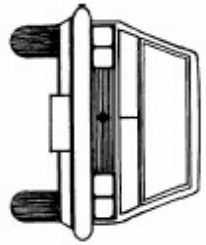
# Suggestions : Select the front view

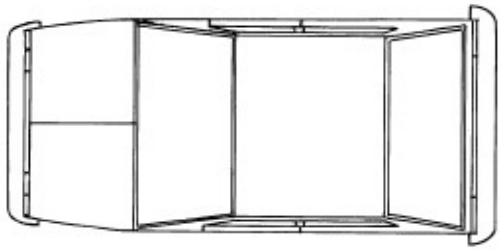
2. The adjacent views project from the selected front view

should be appeared in a natural position.

**Inappropriate**

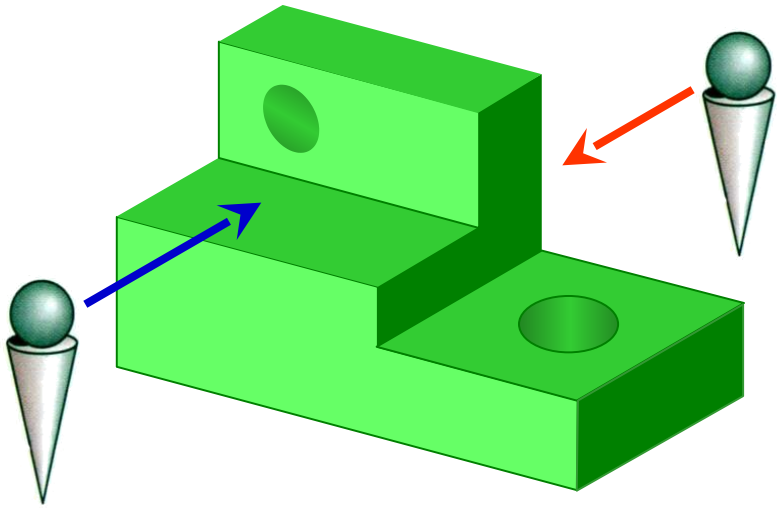


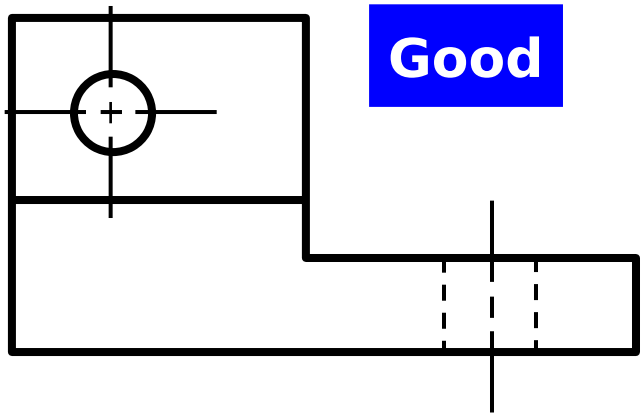




# Suggestions : Select the front view

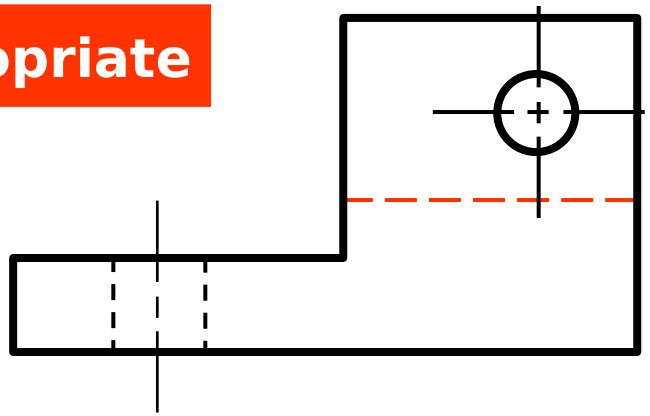
3. It has the fewest number of hidden lines.





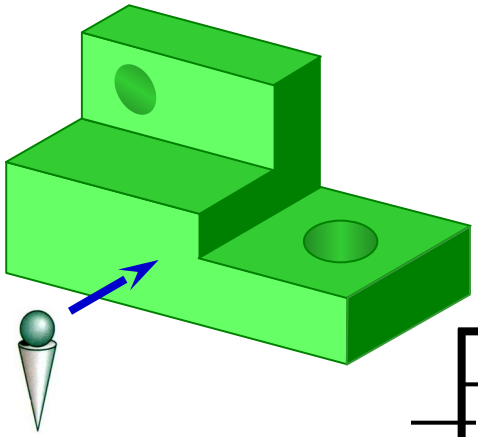
**Good**

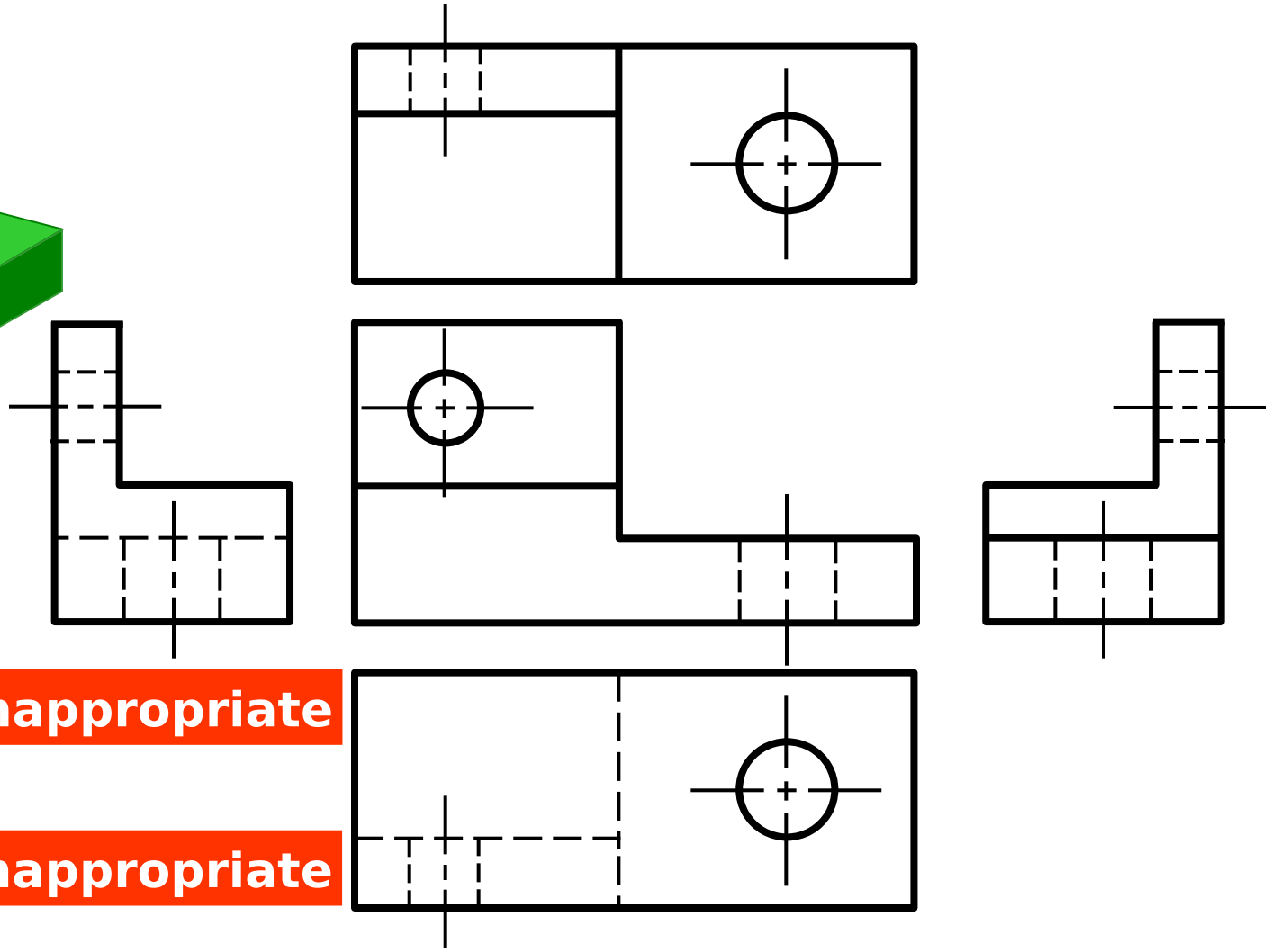
**Inappropriate**



# Suggestions : Select an adjacent view

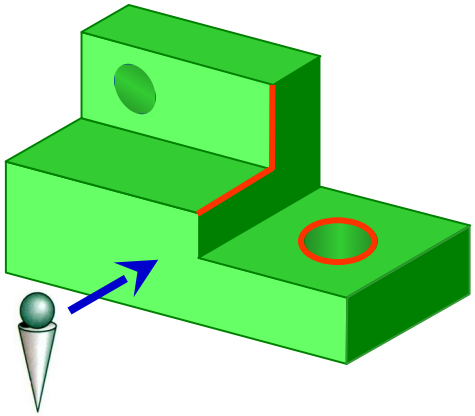
1. Choose the view that has the fewest number of hidden lines.

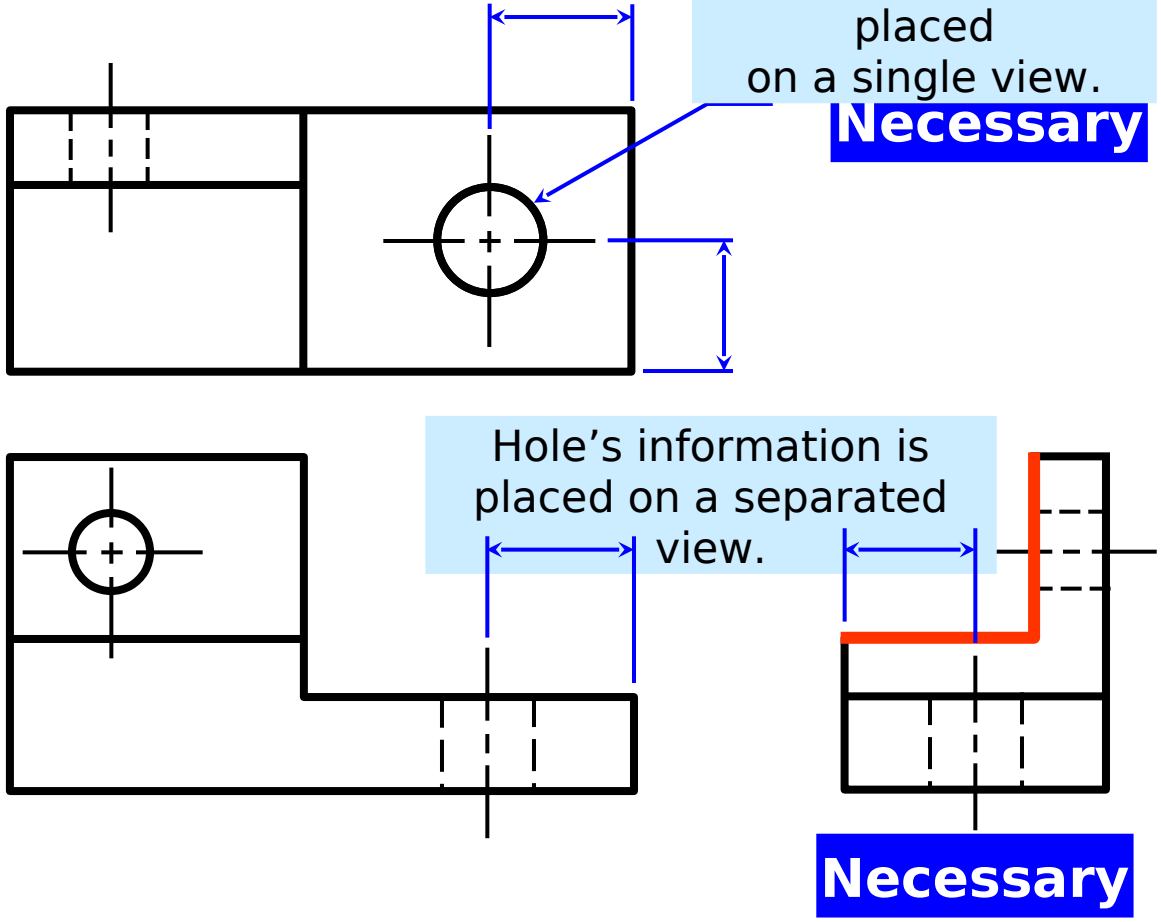




# Suggestions : Select an adjacent view

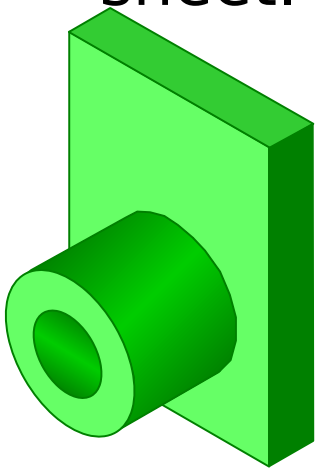
2. Choose the **minimum** number of views that can represent
the major features of the object.

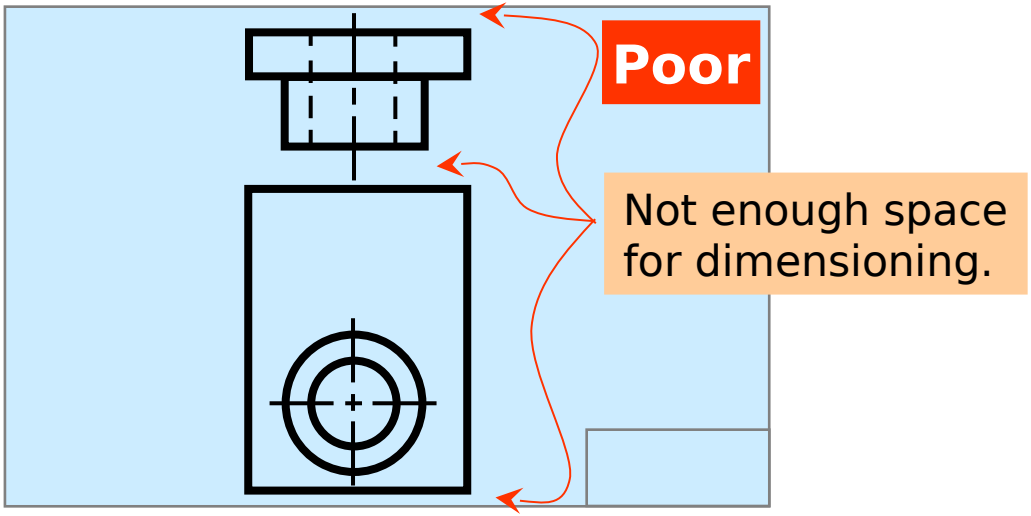


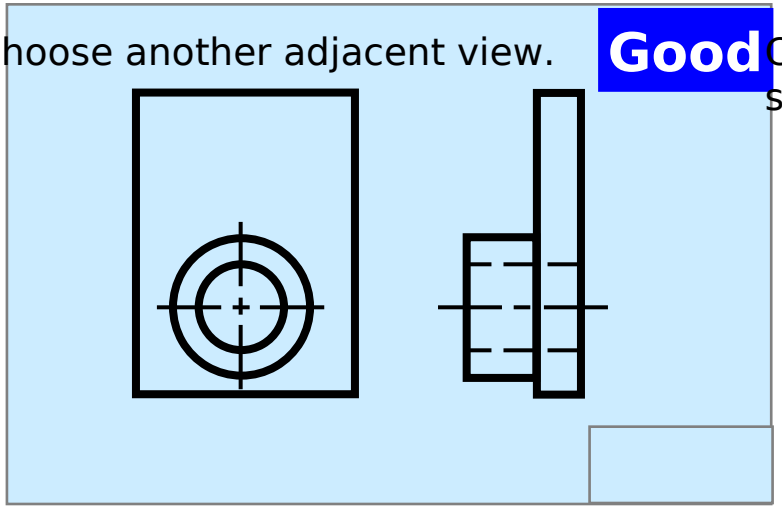


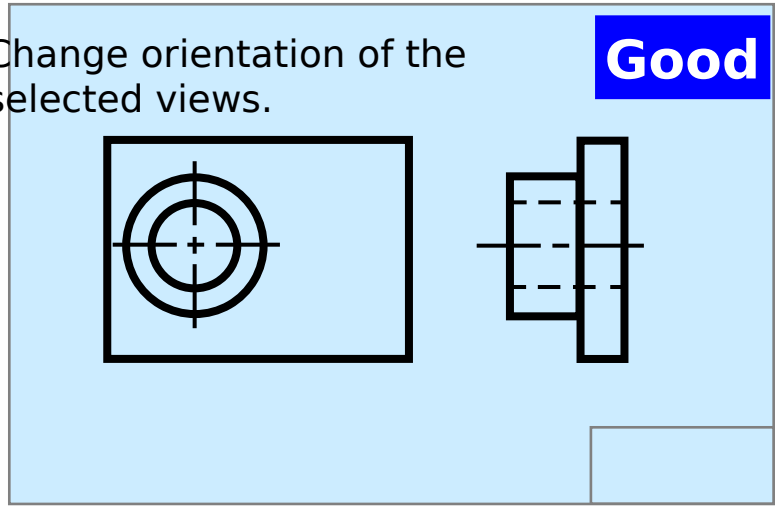
# Suggestions : Select an adjacent view

3. Choose the views that are suitable to a drawing sheet.





# Summary

- View selection has 3 steps




- In practice, drafter should consider all recommendation simultaneously before start to draw.

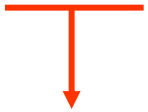



# Additional examples on a view selection

Contents

# Notes

- Generally, three views orthographic drawing is selected to describes an object's information.
- In some specific case, a necessary view may be less or more than three views.

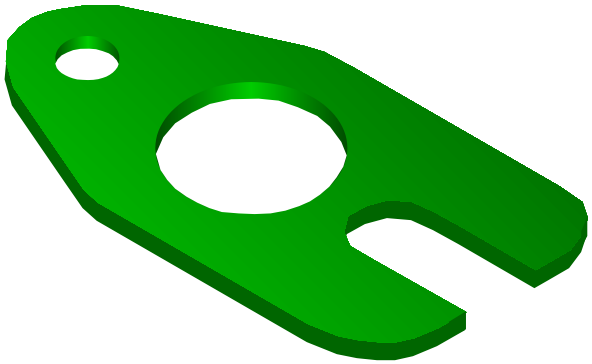


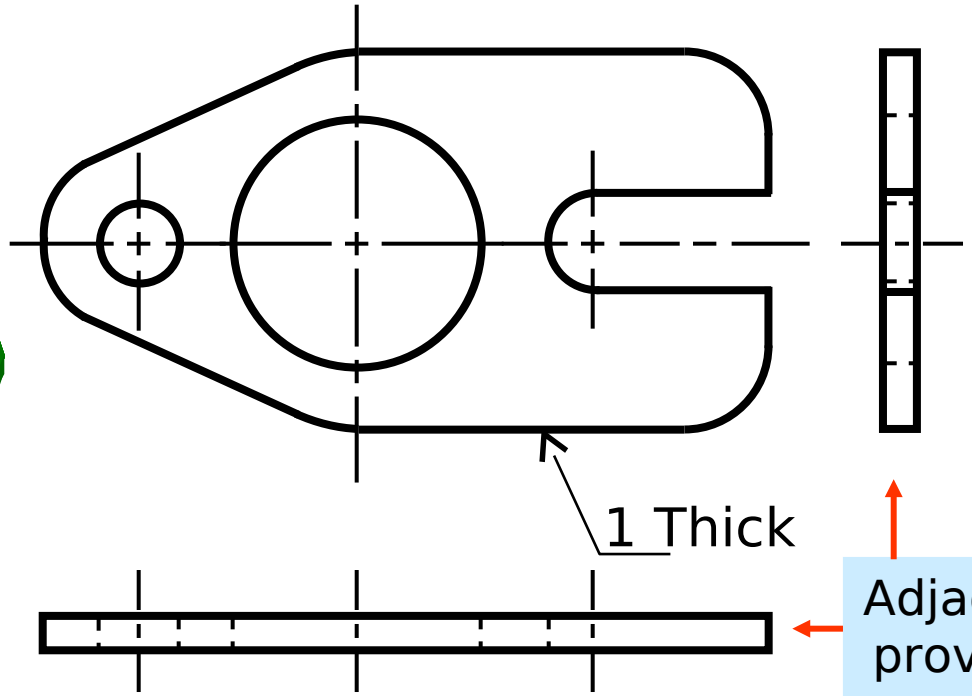
Later chapter

# Object that requires only one-view

- **Flat (thin) part** having a uniform thickness such as a gasket, sheet metal etc.
- **Cylindrical-shaped** part.

**Example**



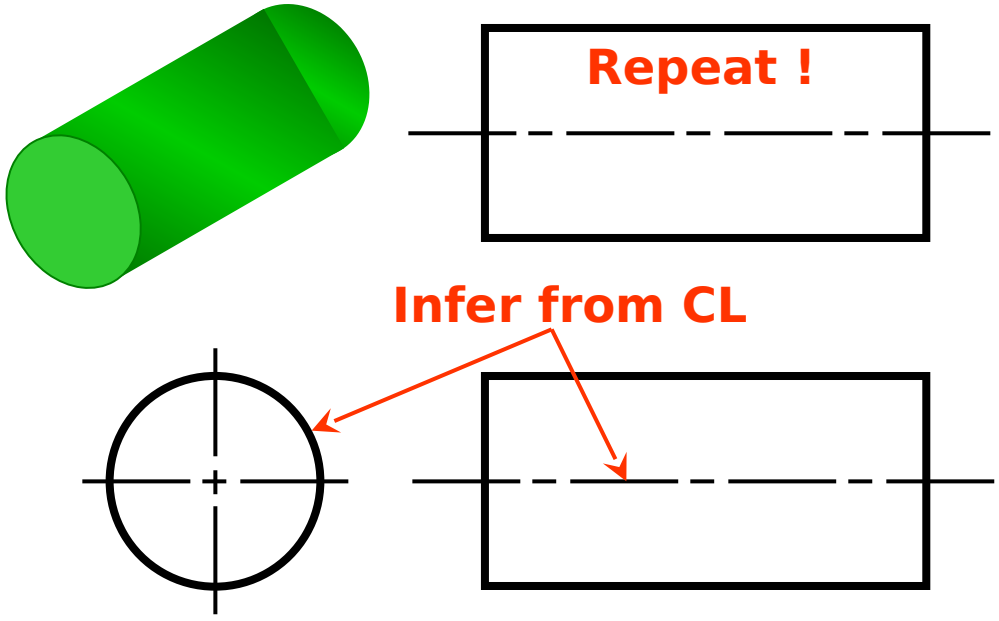



Adjacent views provide only a part's thickness !

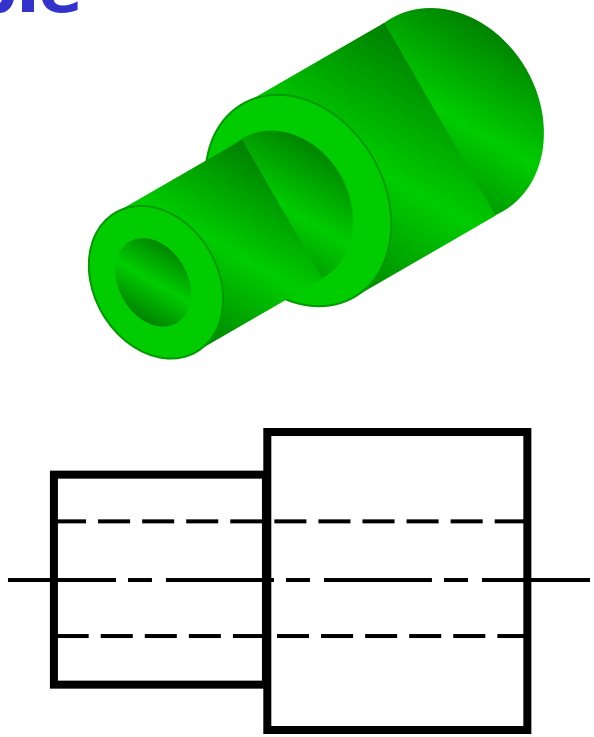
# Object that requires only one-view

- **Flat (thin) part** having a uniform thickness such as a gasket, sheet metal etc.
- **Cylindrical-shaped** part.

**Example**



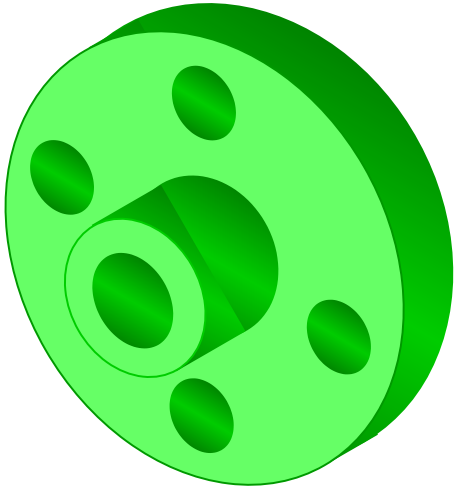

**Example**

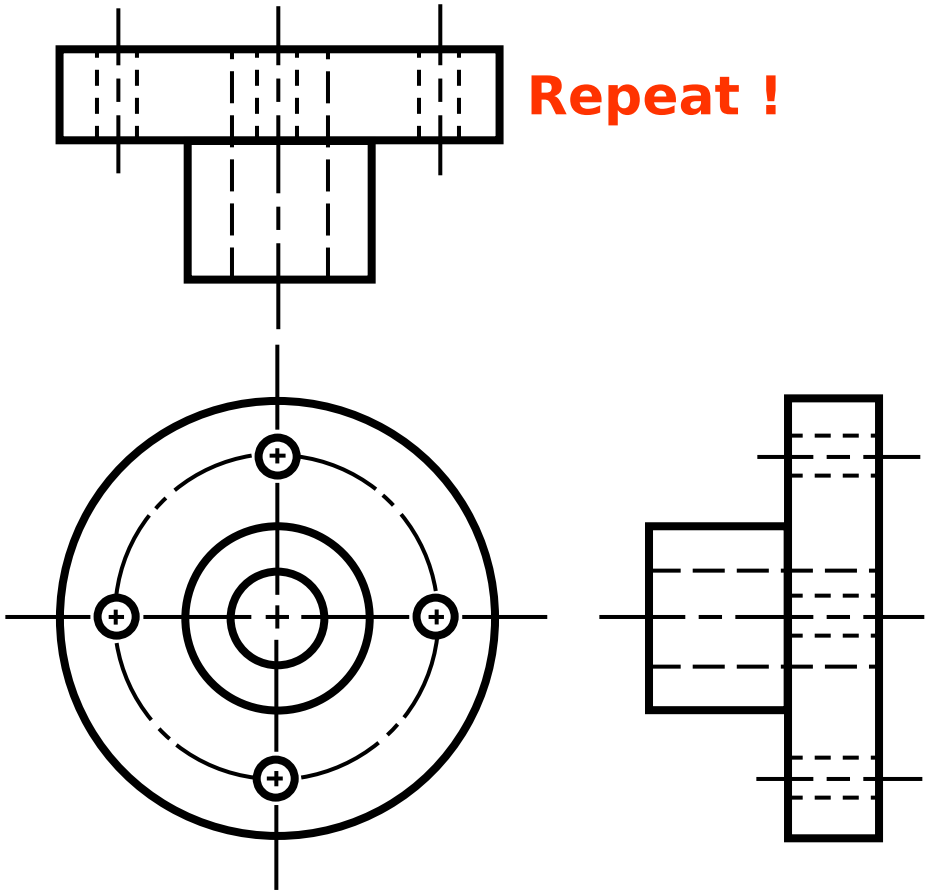


# Object that requires only two-view

- Identical adjacent view exists.
- The 3rd view has no significant contours of the object. (provides no additional information)

**Example**



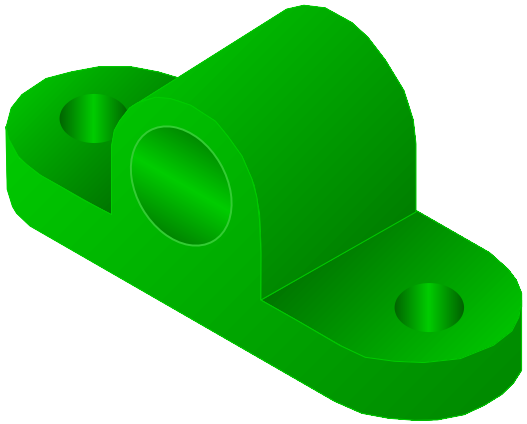


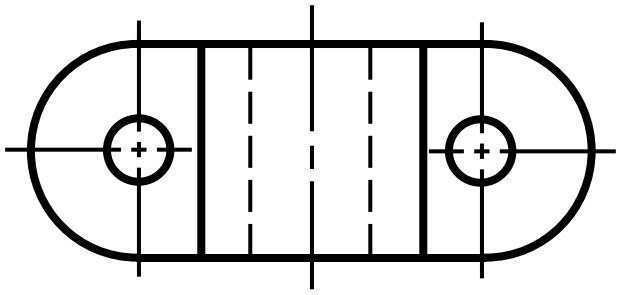
**Repeat !**

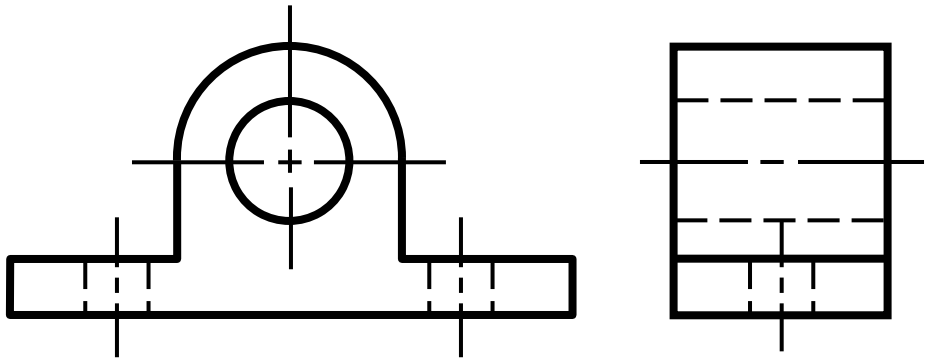
# Object that requires only two-view

- Identical view exists.
- The 3rd view has no significant contours of the object. (provides no additional information)

## Example 1



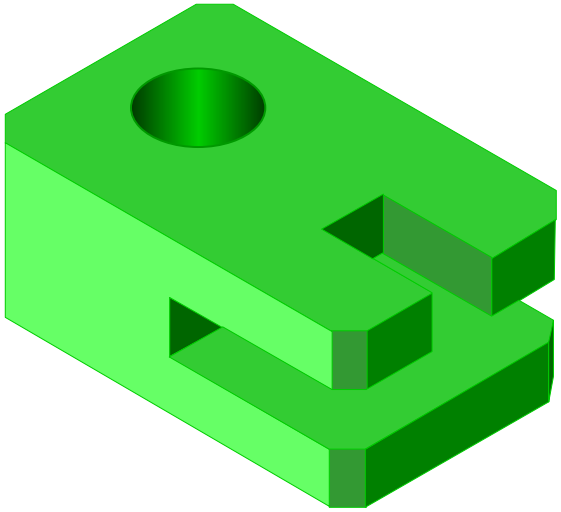


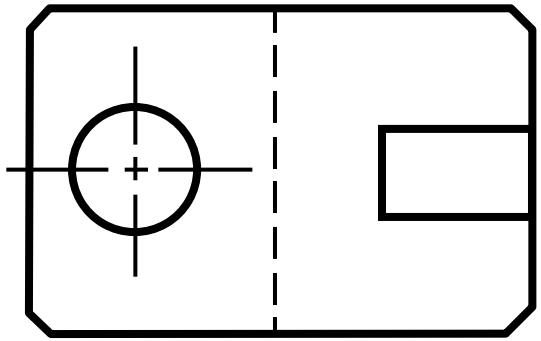


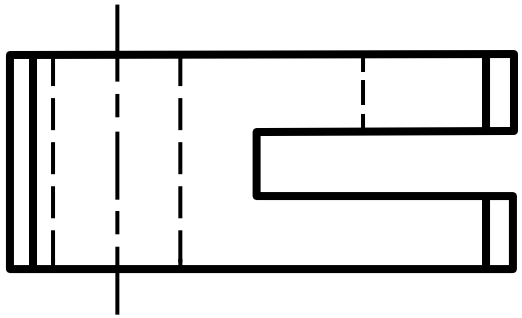
# Object that requires only two-view

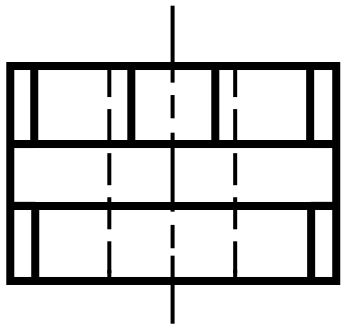
- Identical view exists.
- The 3rd view has no significant contours of the object. (provides no additional information)

## Example 2

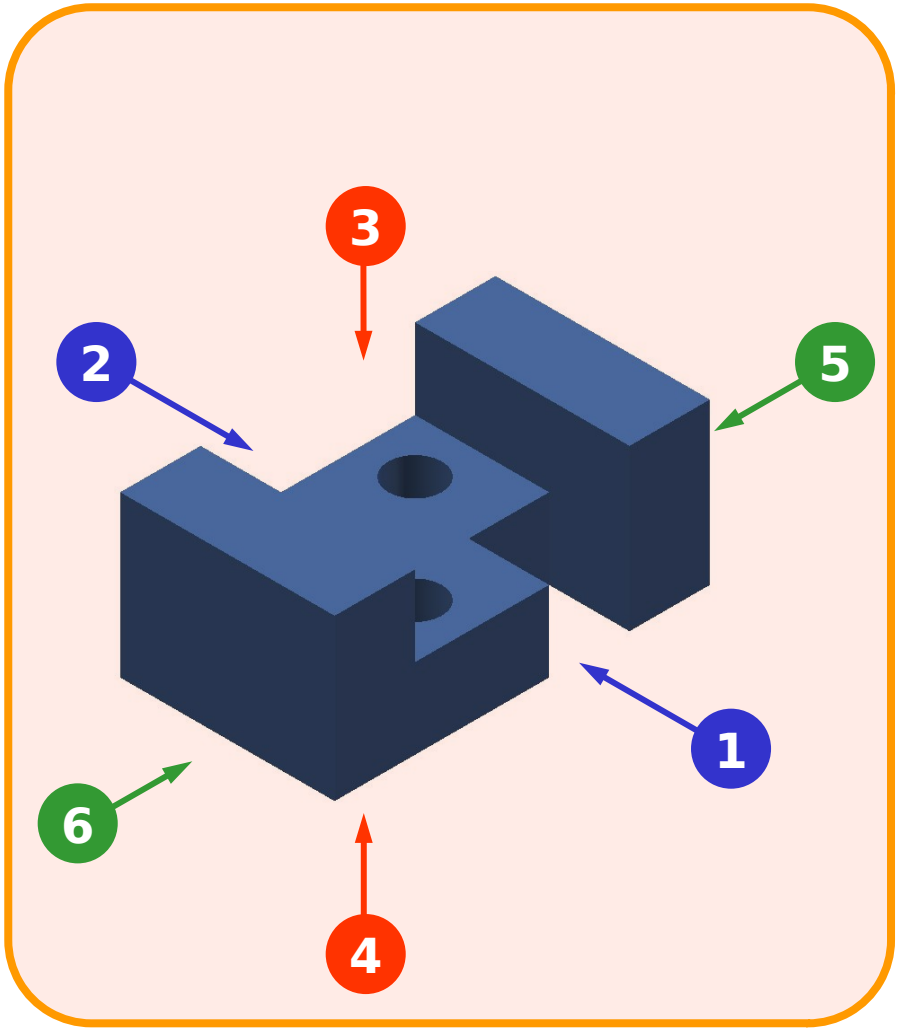








# Class activity : View selection

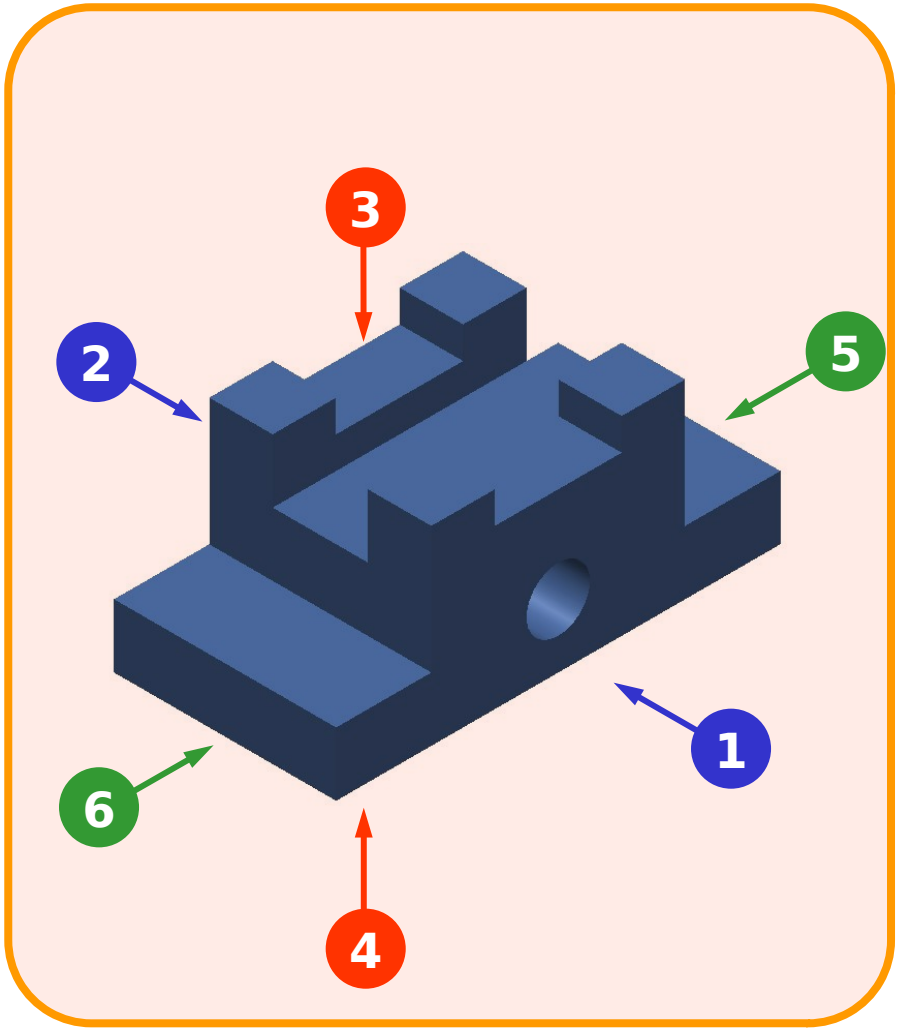



Select a necessary view ?

- ☐ View 1
- ☐ View 2
- ☐ View 3
- ☐ View 4
- ☐ View 5
- ☐ View 6

Reset Check

# Class activity : View selection

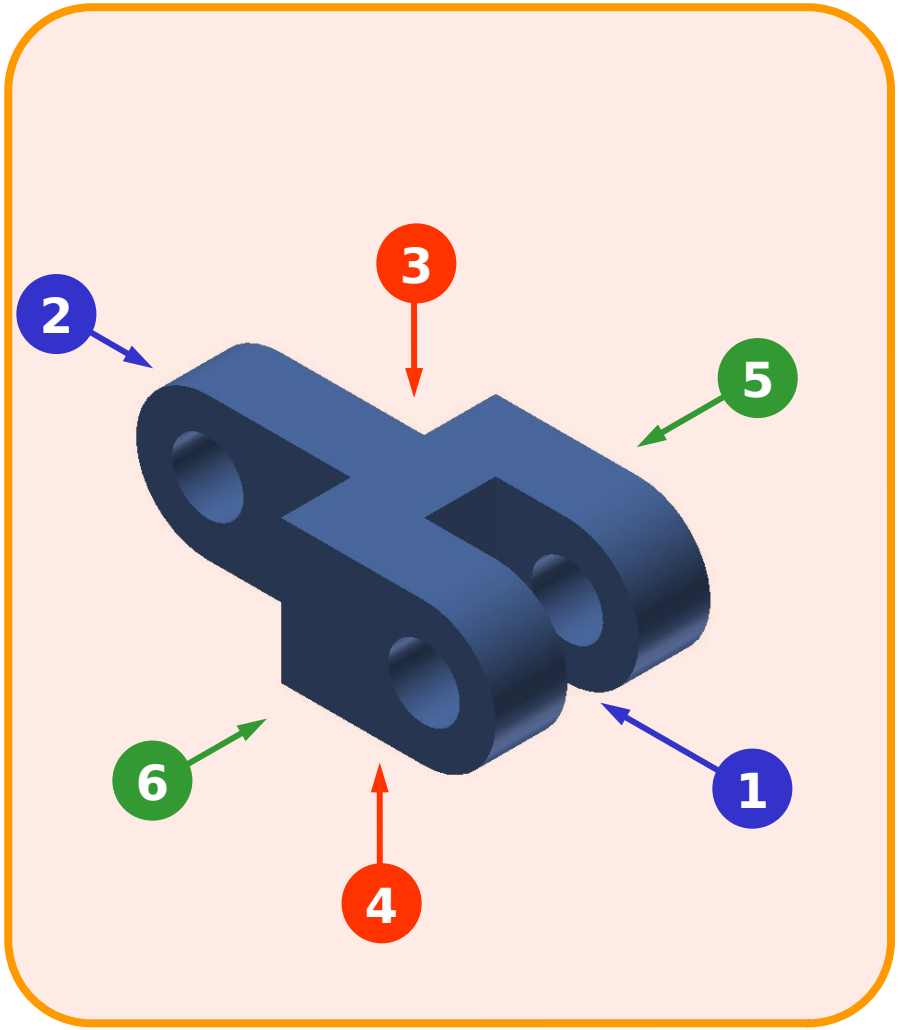



Select a necessary view ?

- ☐ View 1
- ☐ View 2
- ☐ View 3
- ☐ View 4
- ☐ View 5
- ☐ View 6

Reset Check

# Class activity : View selection




Select a necessary view ?

- ☐ View 1
- ☐ View 2
- ☐ View 3
- ☐ View 4
- ☐ View 5
- ☐ View 6

Reset Check






# Alignment of views

Contents

# Projection systems

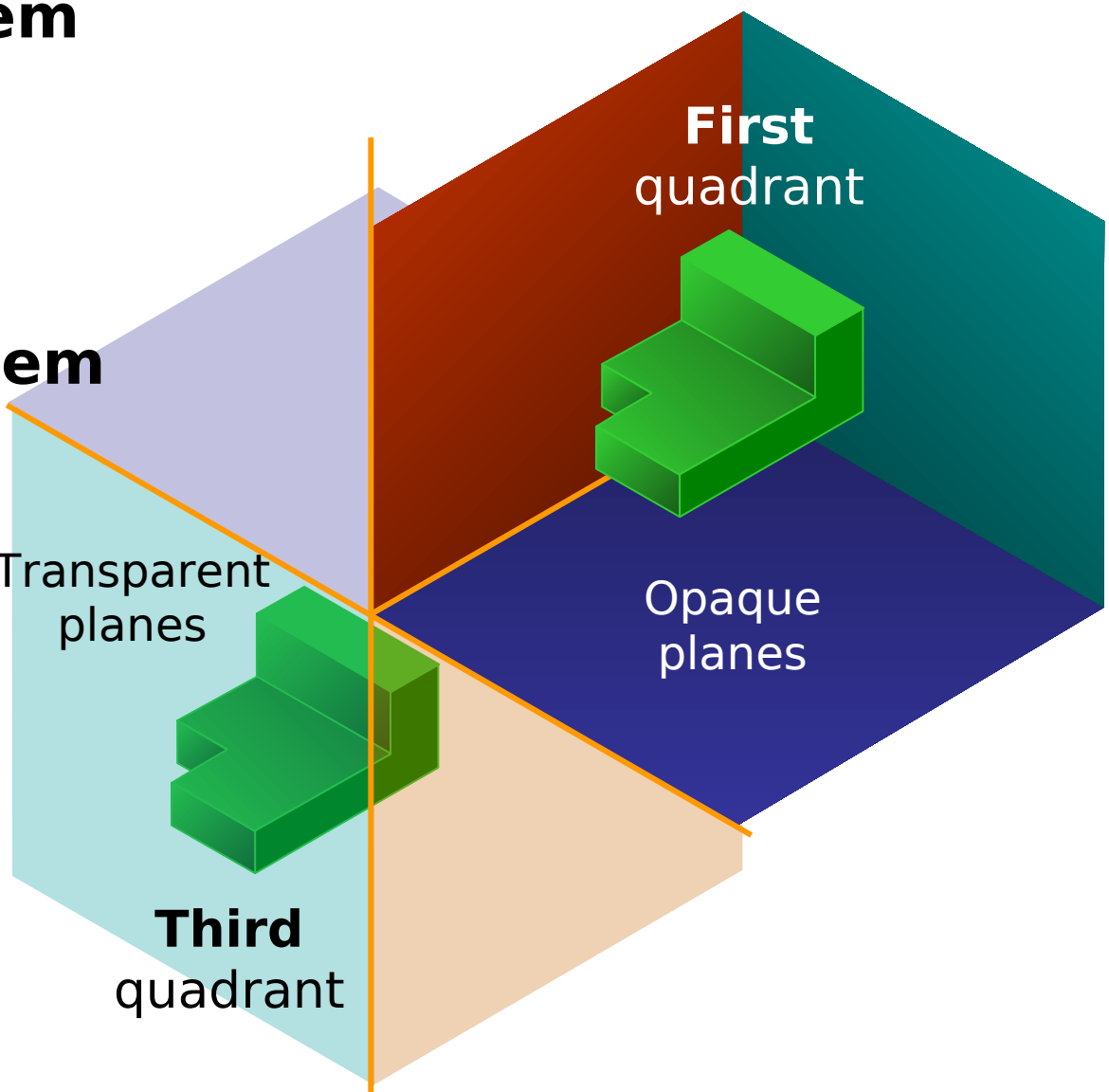
**1. First angle system**

- European countries
- ISO standard

**2. Third angle system**

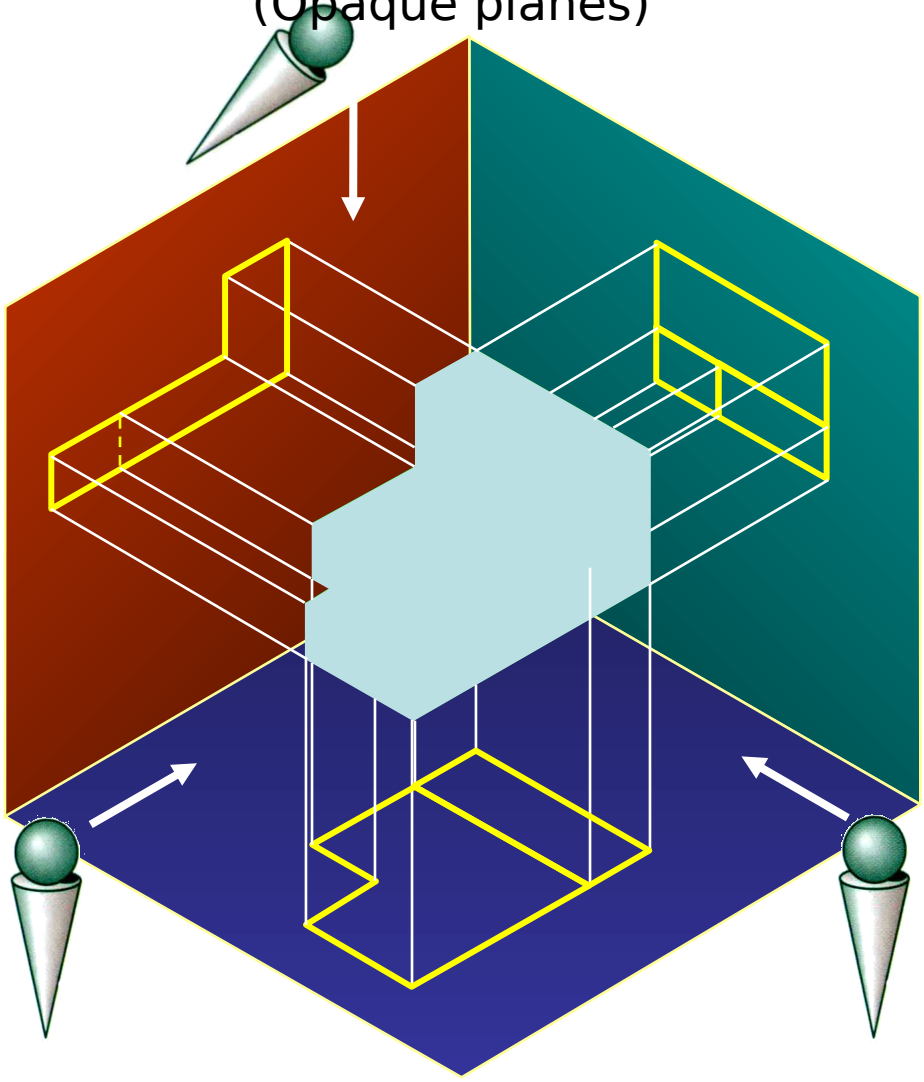
- Canada, USA, Japan, Thailand



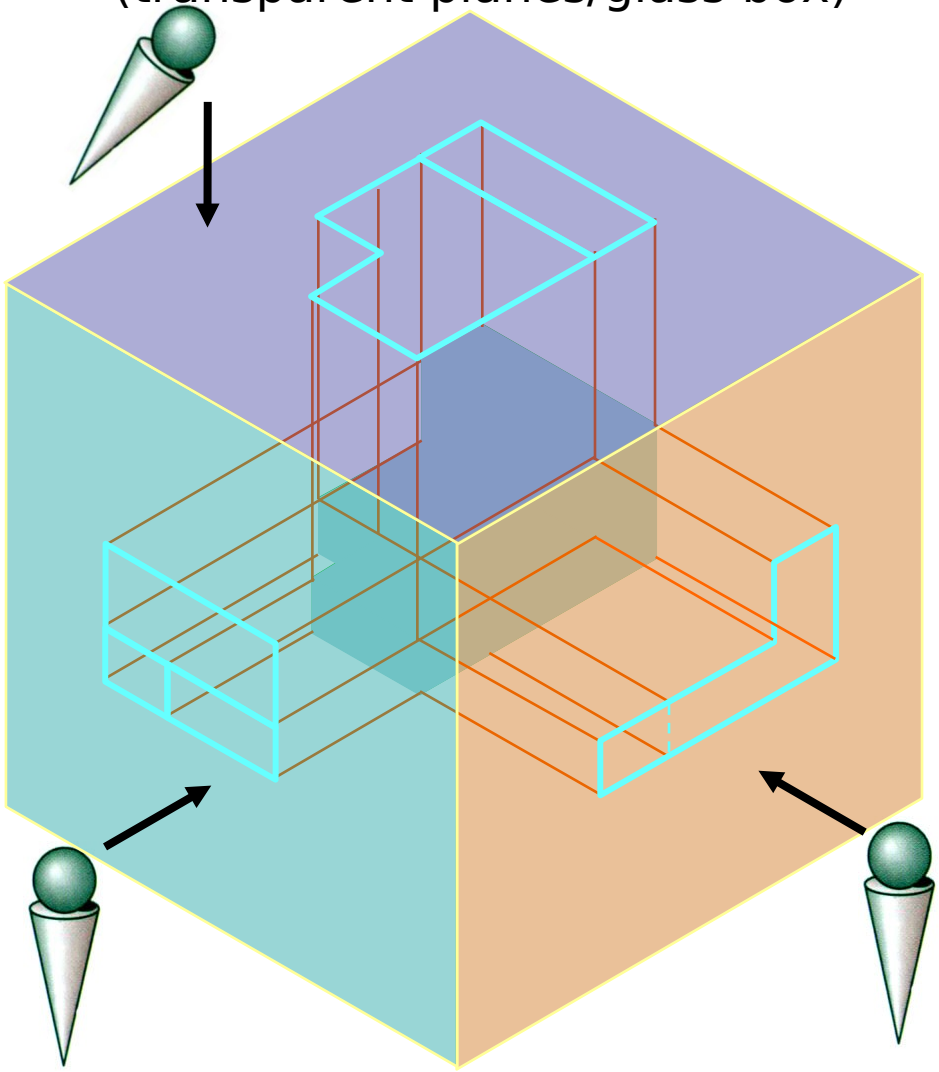


# Orthographic views

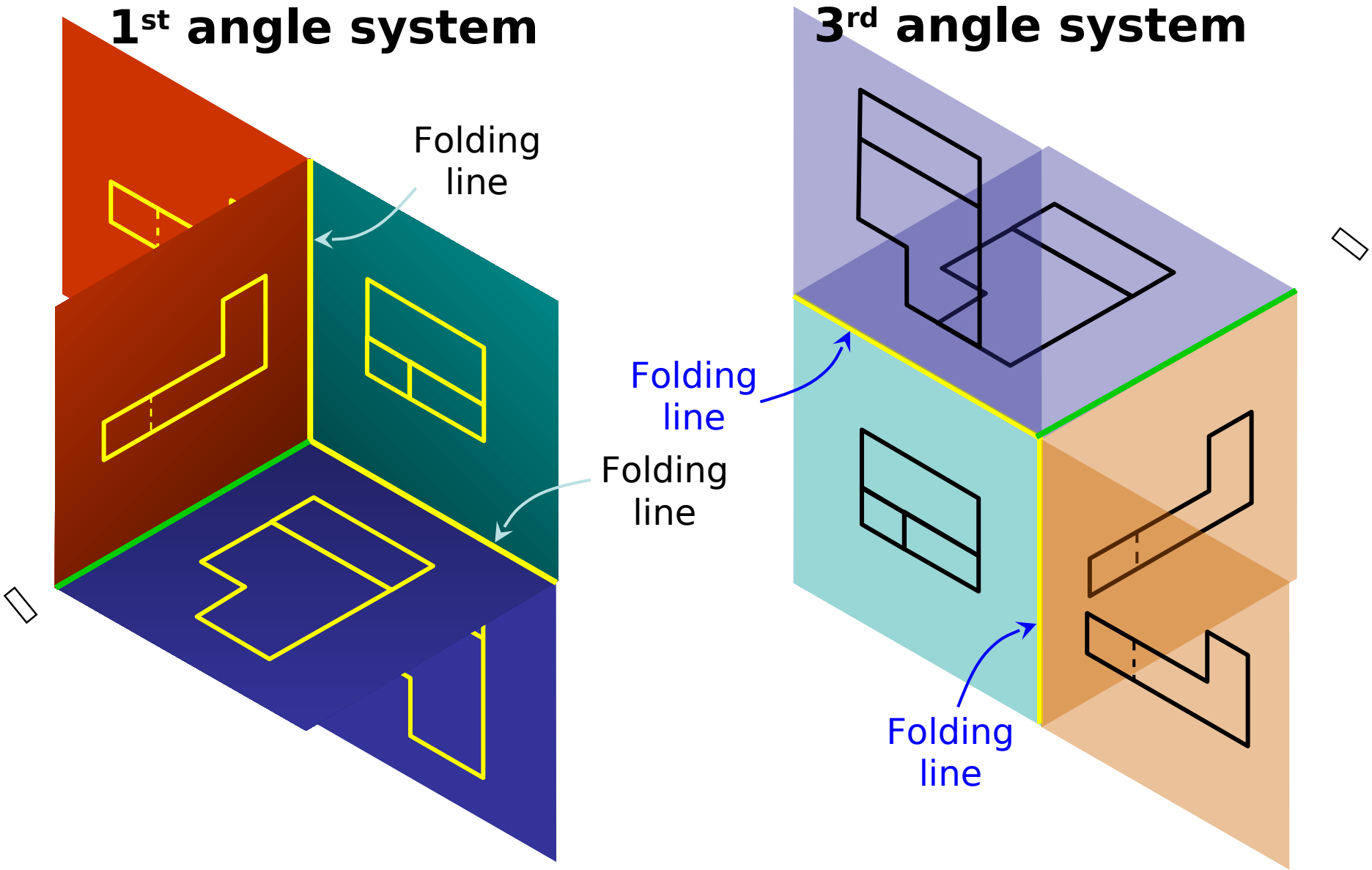
## 1st angle system
(Opaque planes)



## 3rd angle system
(transparent planes/glass box)

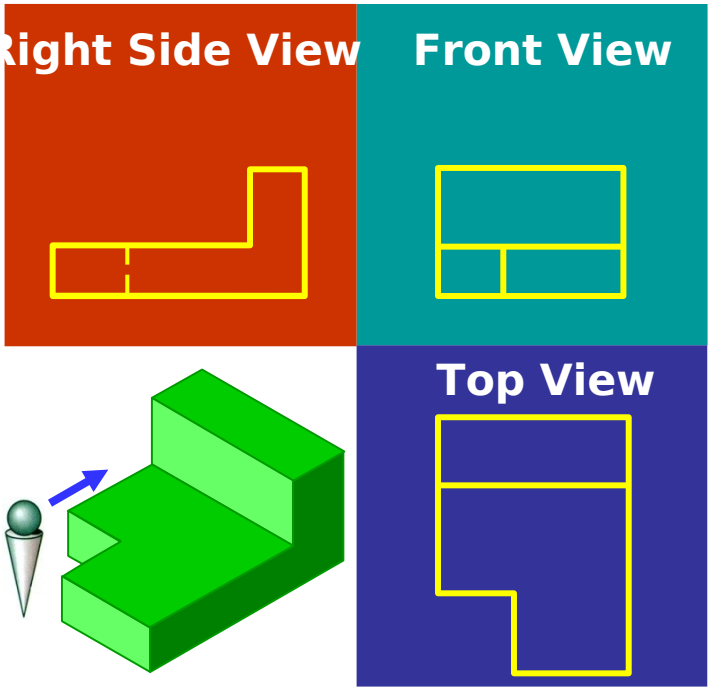


# Orthographic views

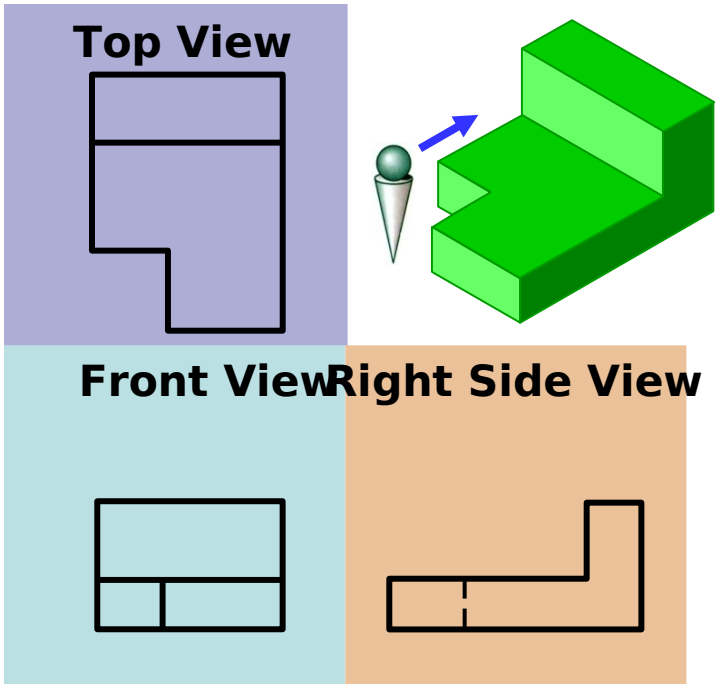


# Views arrangement

## 1st angle system

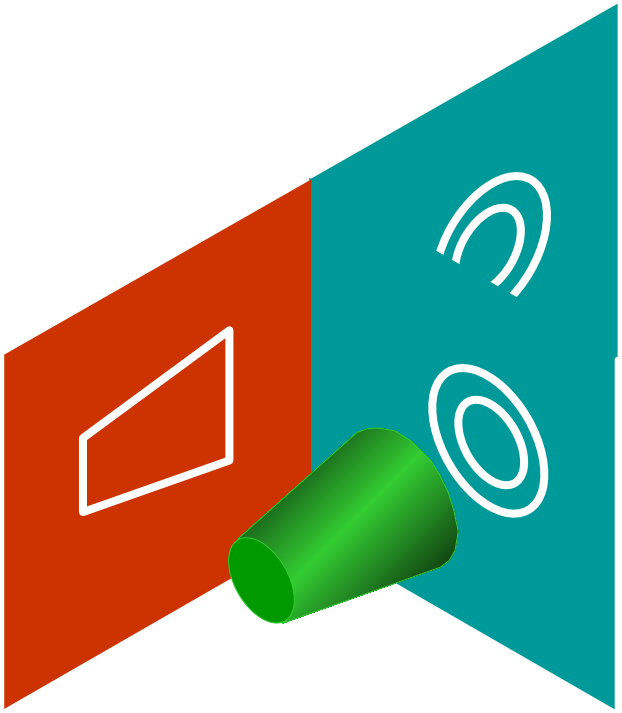


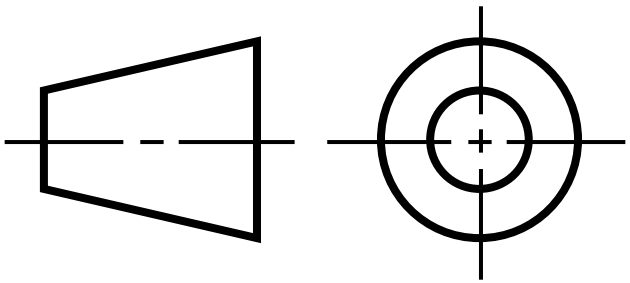

## 3rd angle system



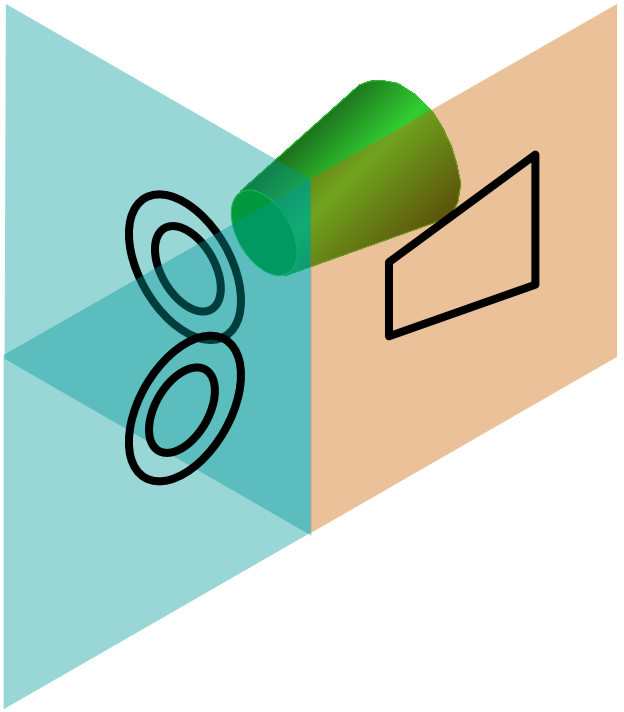
# Projection symbols

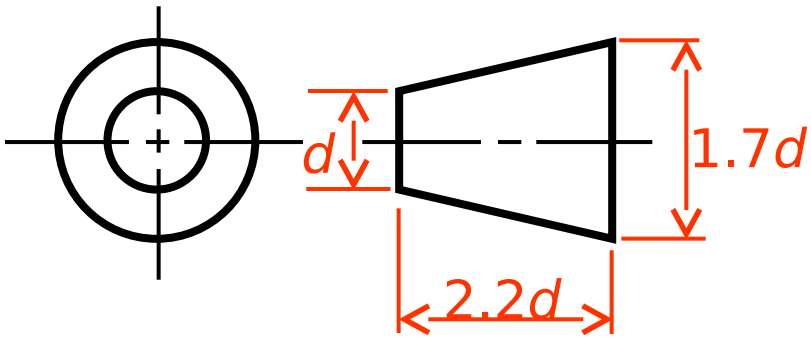
## 1st angle system





## 3rd angle system







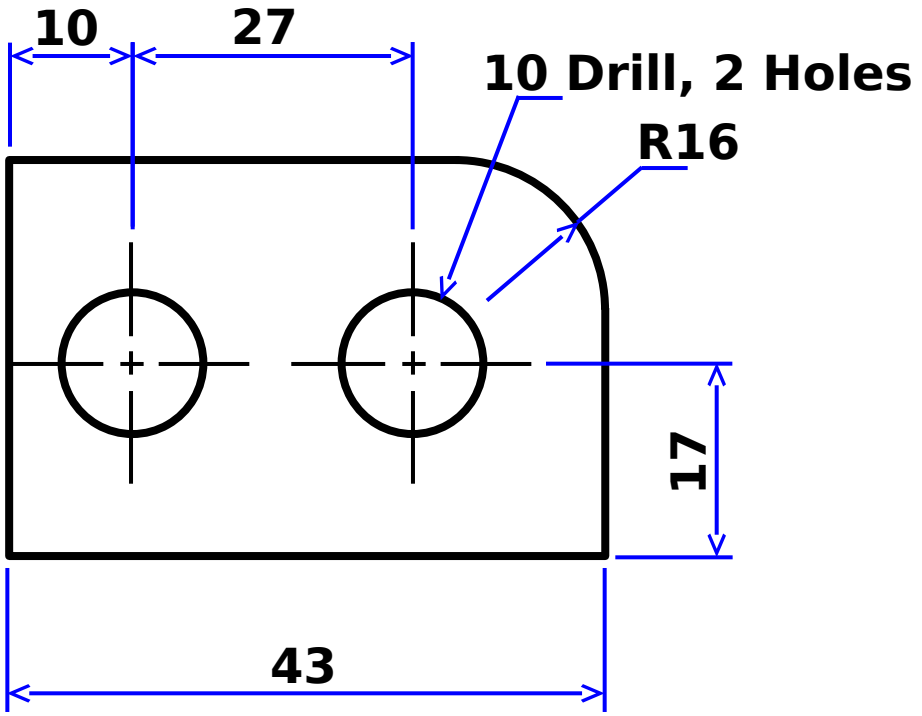



# Basic dimensioning

Contents

# Dimensioning components

1. Extension lines
2. Dimension lines
3. Leader lines
4. Dimension numbers
5. Local notes





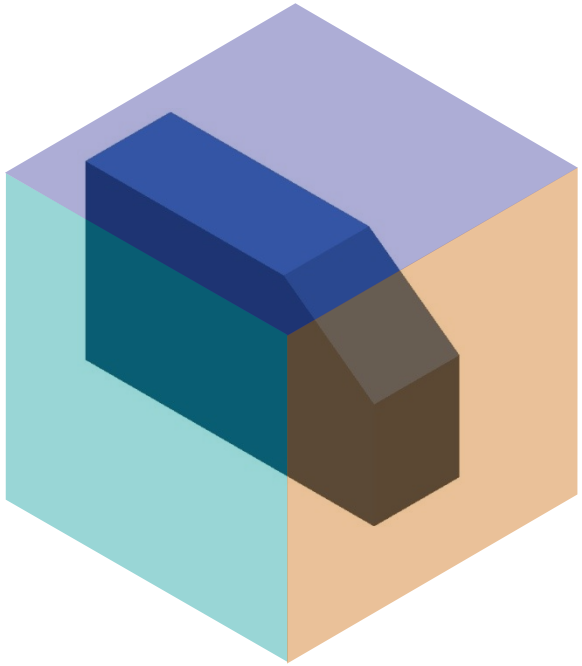



# Primary auxiliary view

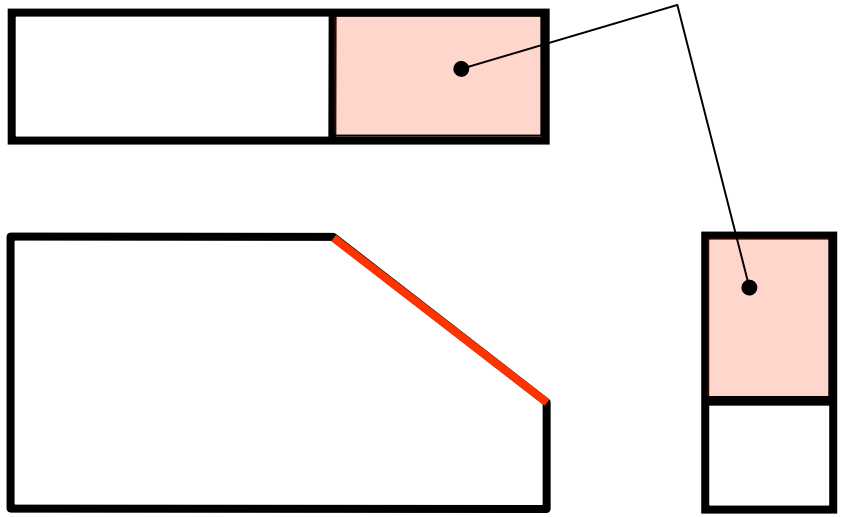
Contents

# Necessity

- Auxiliary view is needed when it is desirable to show the true size and shape of a surface that is not parallel to anyone of the principal planes of projection.



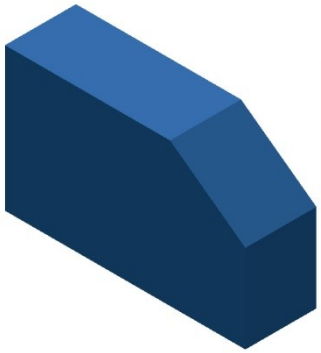
True size can not be observed from these principal views.



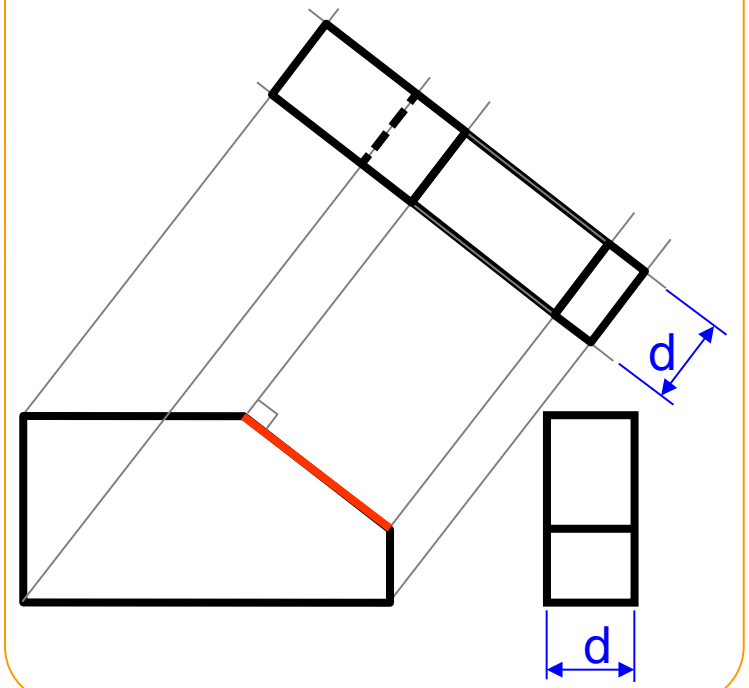
# Use of auxiliary view

In practice, an auxiliary view is usually a partial view showing only the desired information.

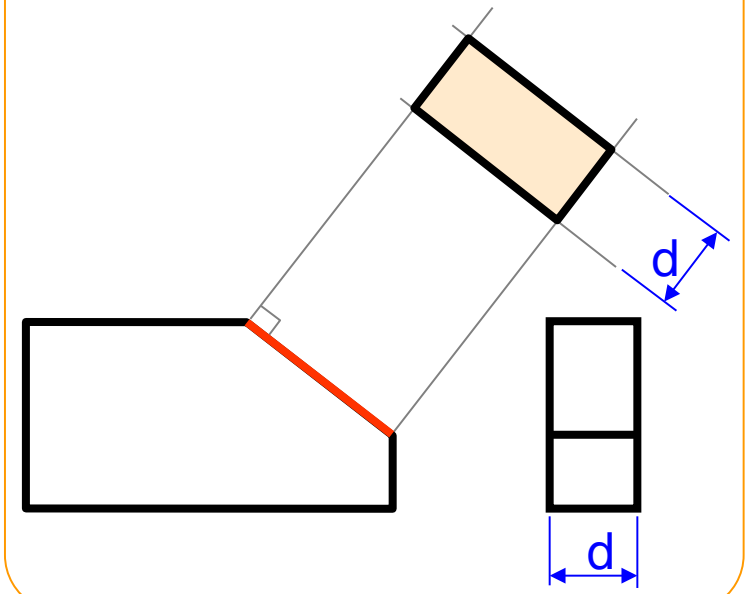
## Example



**Complete view**




**Partial view**



# Types of an auxiliary view

Primary auxiliary views may be classified into 3 types by their relative to the principal views.

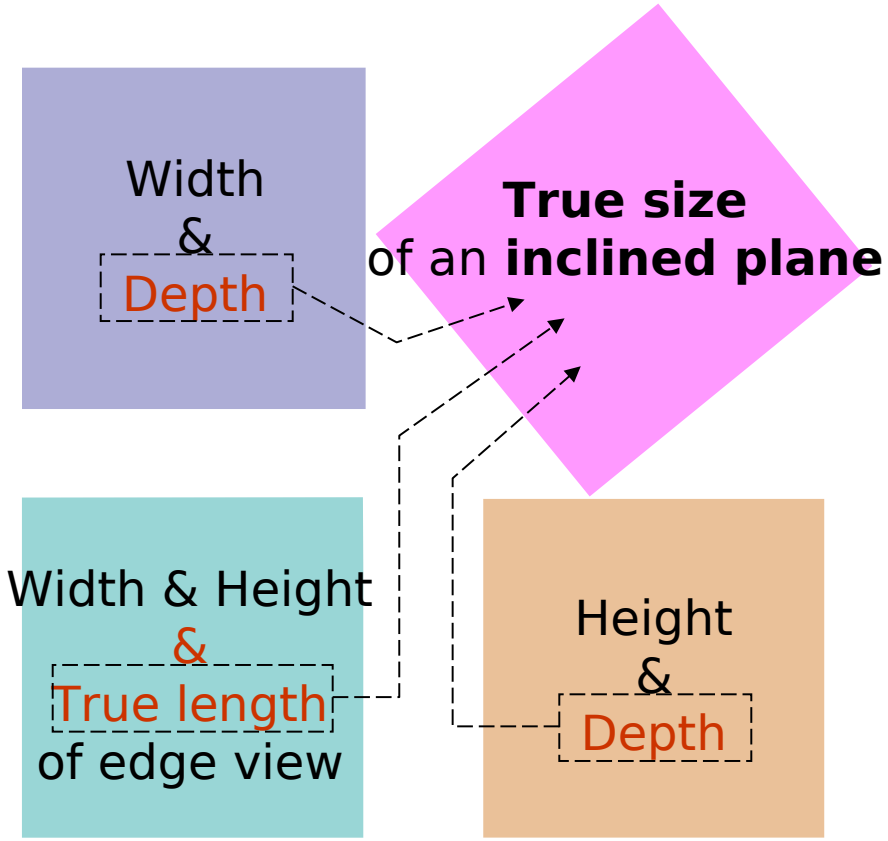
1. Adjacent to front view
2. Adjacent to top view
3. Adjacent to side view

# Auxiliary view adjacent to front view

**Glass box and revolution**

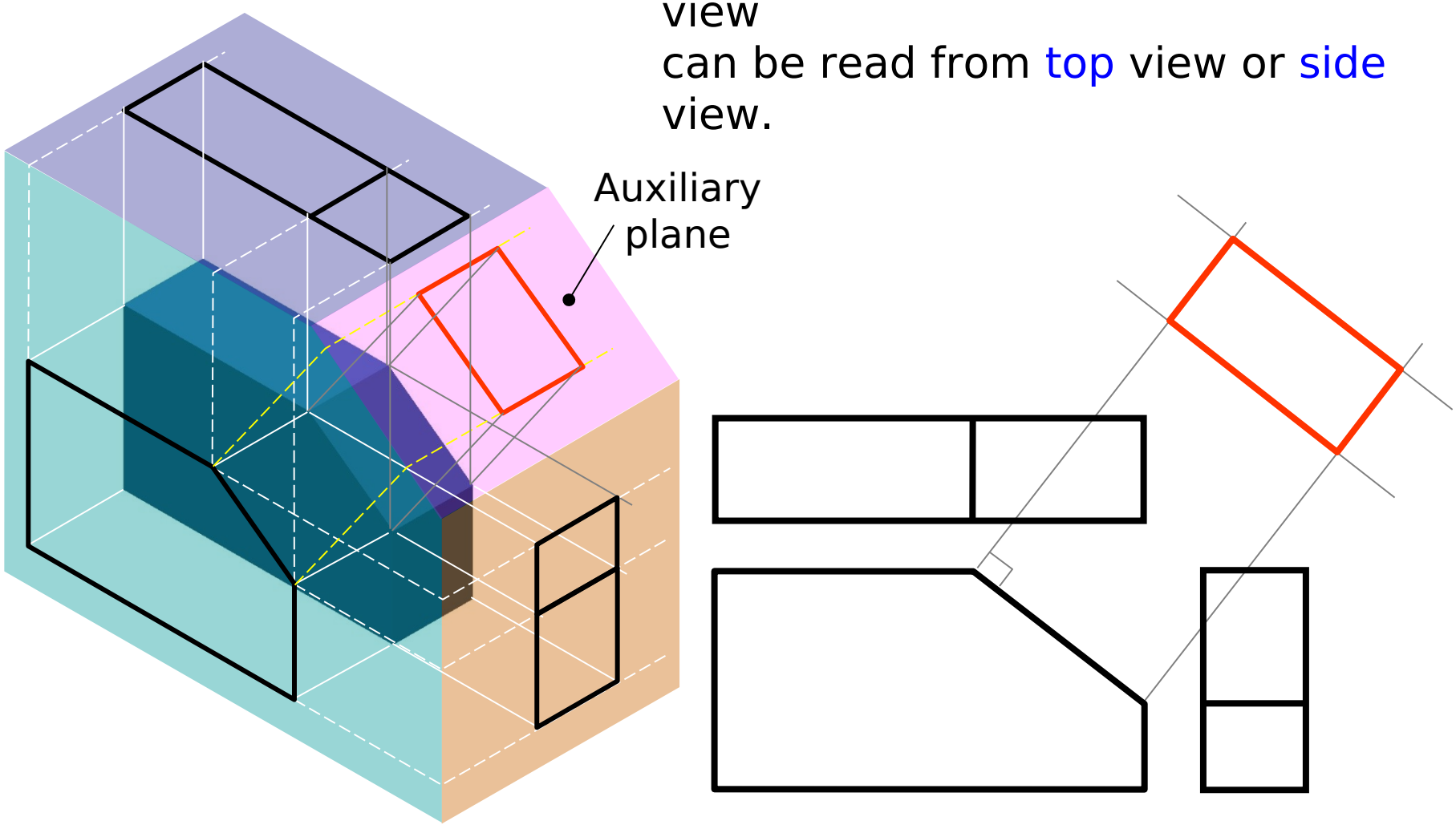


**View arrangement**

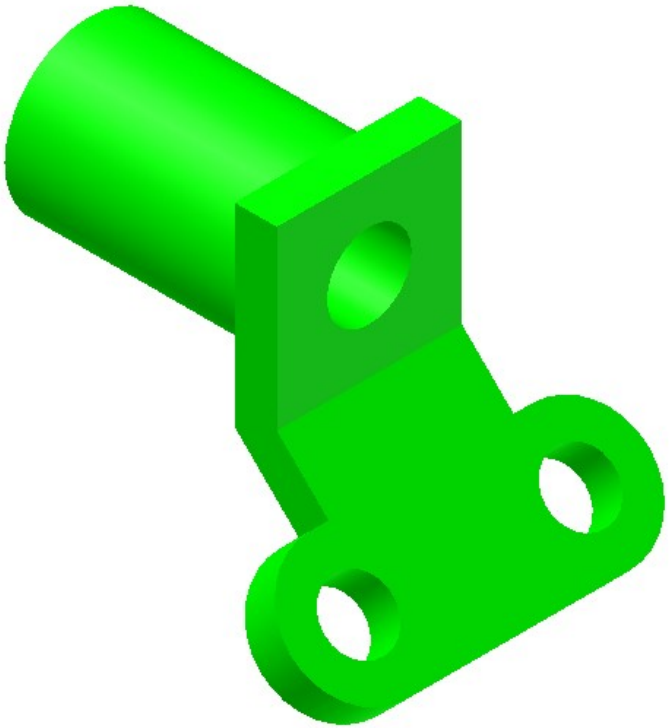


# Example 1

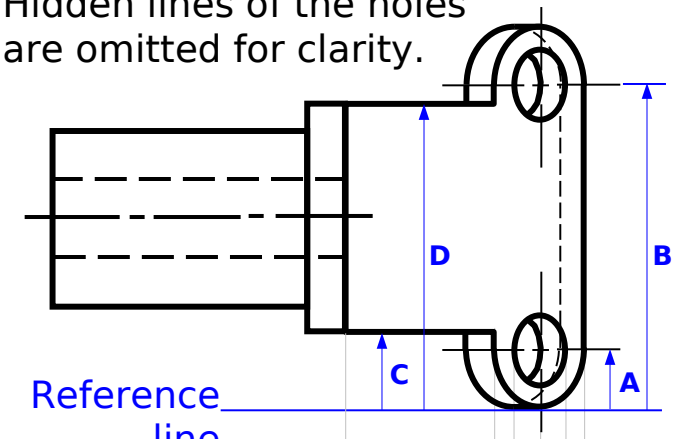
- Do you remember?
  Depth dimension of the auxiliary view
  can be read from top view or side view.

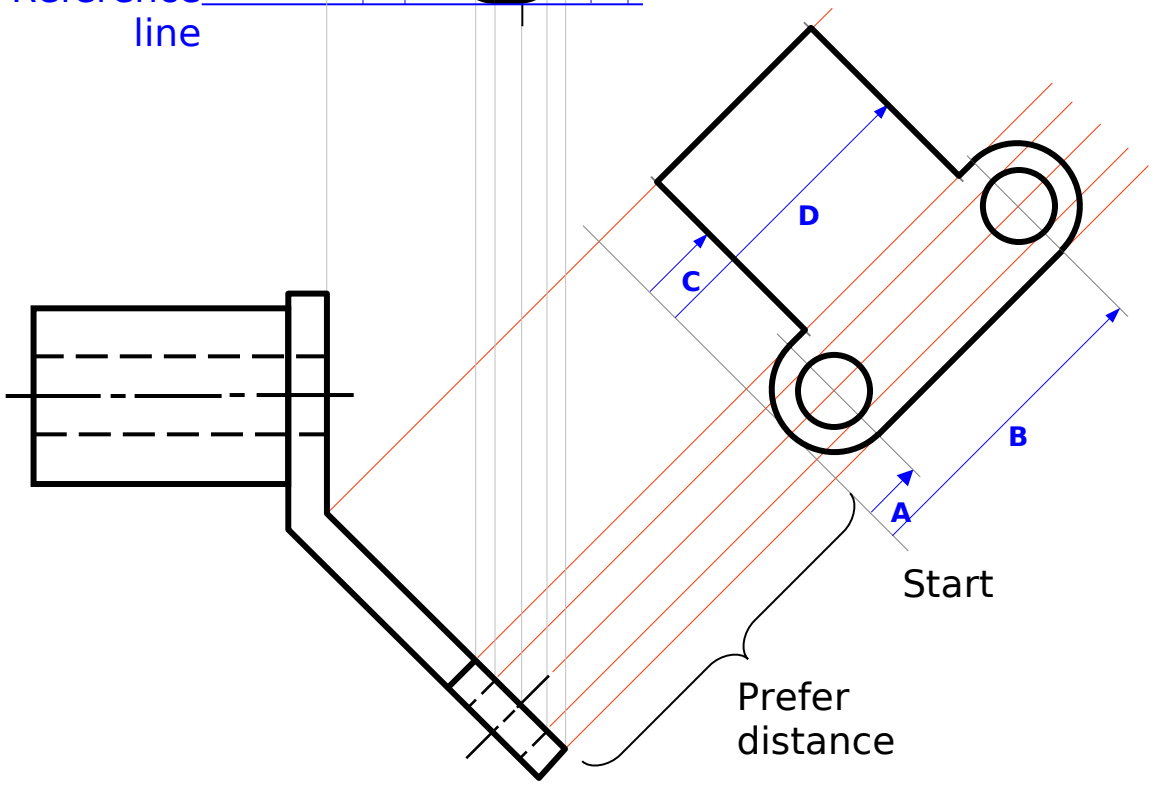


# Example 2



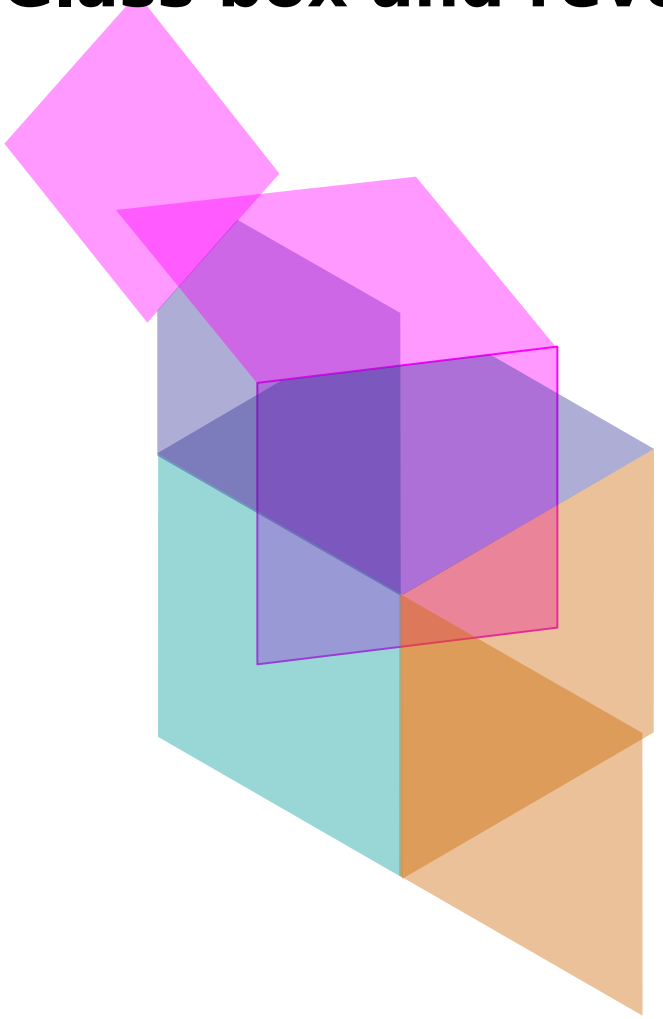
Hidden lines of the holes
are omitted for clarity.



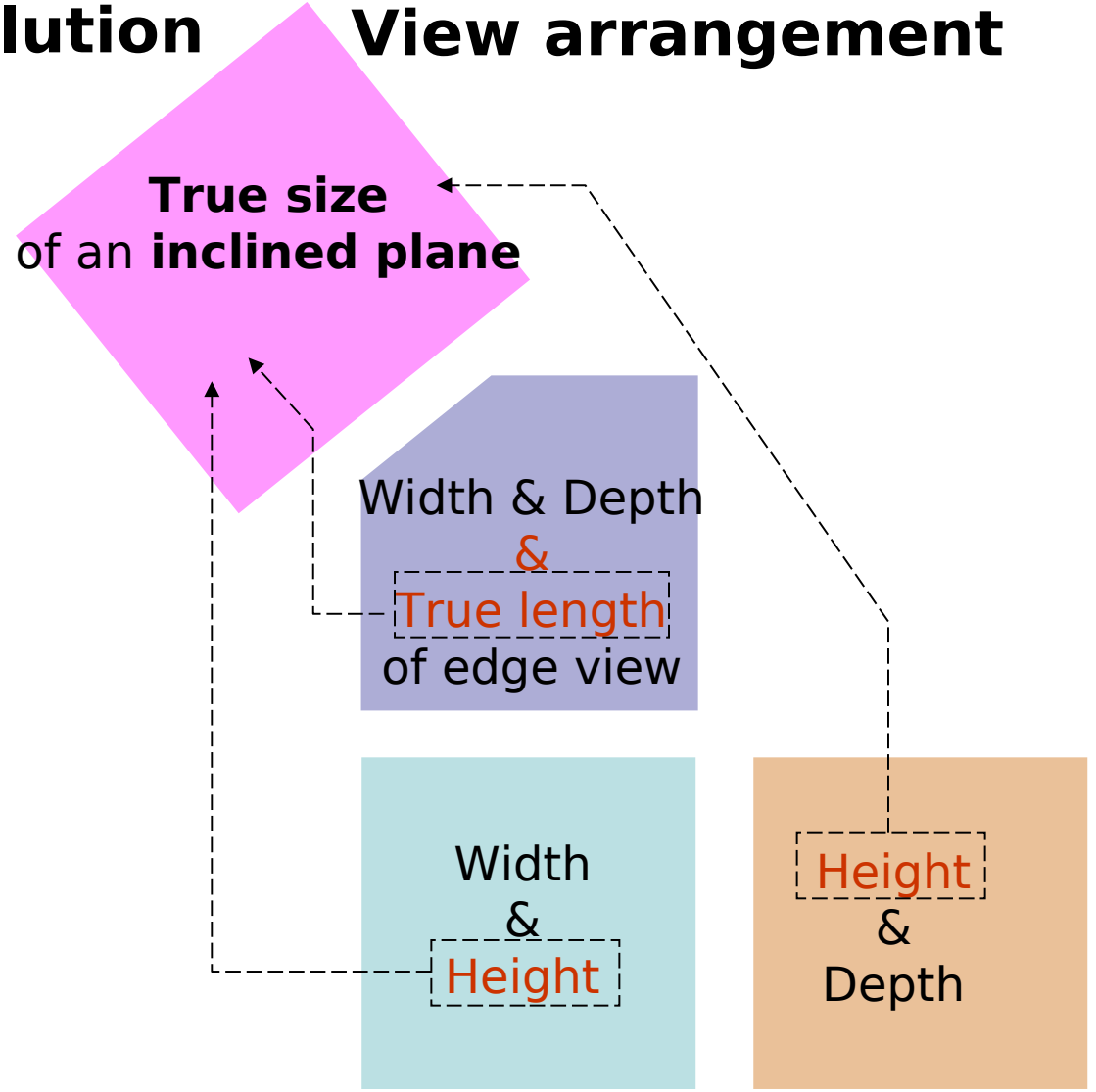



# Auxiliary view adjacent to top view

## Glass box and revolution



## View arrangement

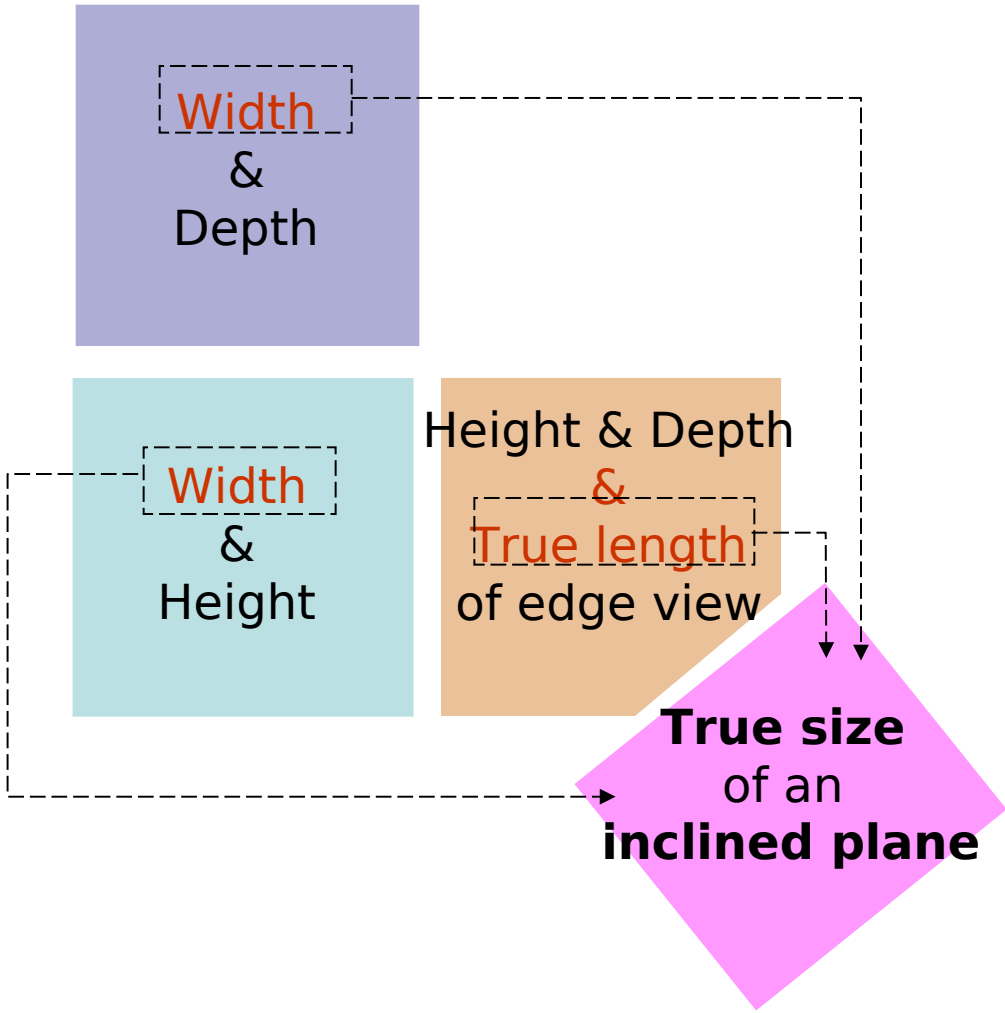


# Auxiliary view adjacent to side view

## Glass box and revolution



## View arrangement



# Example

