

HBJS



机械制图

§ 2-2 三视图的形成及其投影规律

HBJS

1. 三投影面体系的建立

2. 三视图的投影对应关系

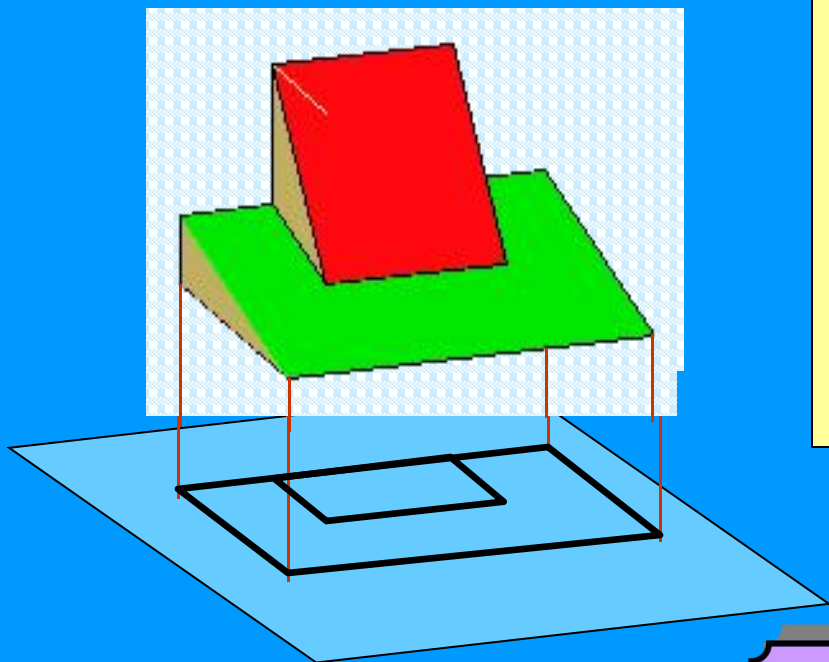
3. 三视图与物体方位对应关系

4. 三视图的作图与读图

§ 2-2 三视图的形成及其投影规律

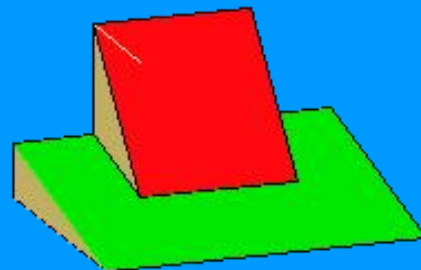
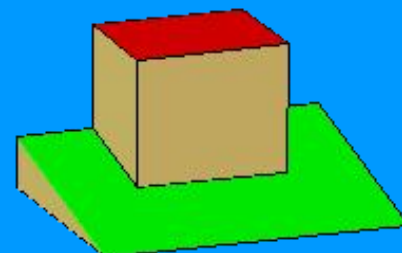
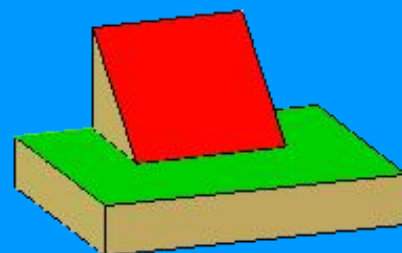
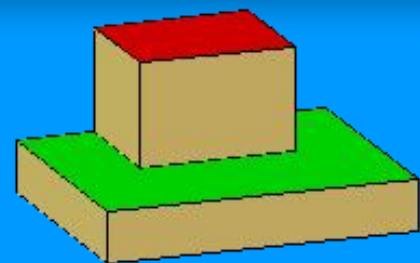
一、三投影面体系的建立

1、问题的提出



结论： 物体的一个投影不能唯一确定该物体的空间形状。

物体的单面投影

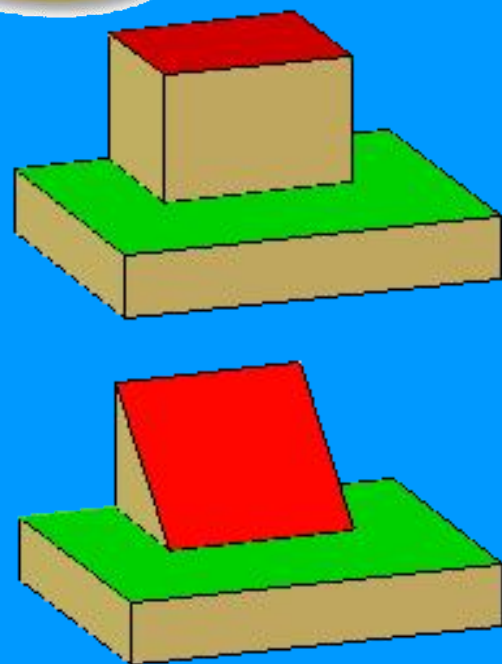
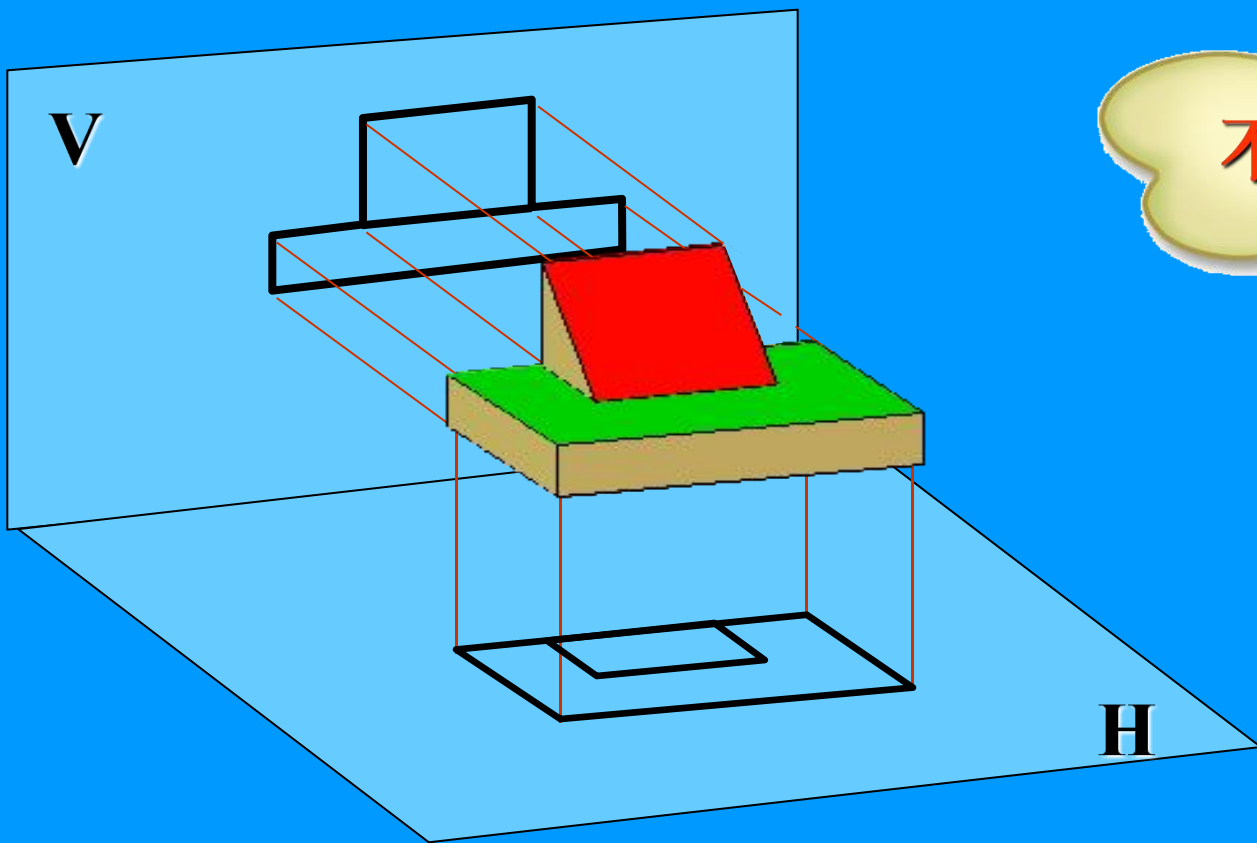


§ 2-2 三视图的形成及其投影规律

2、两面投影图

能否唯一确定物体的空间形状？

不一定！



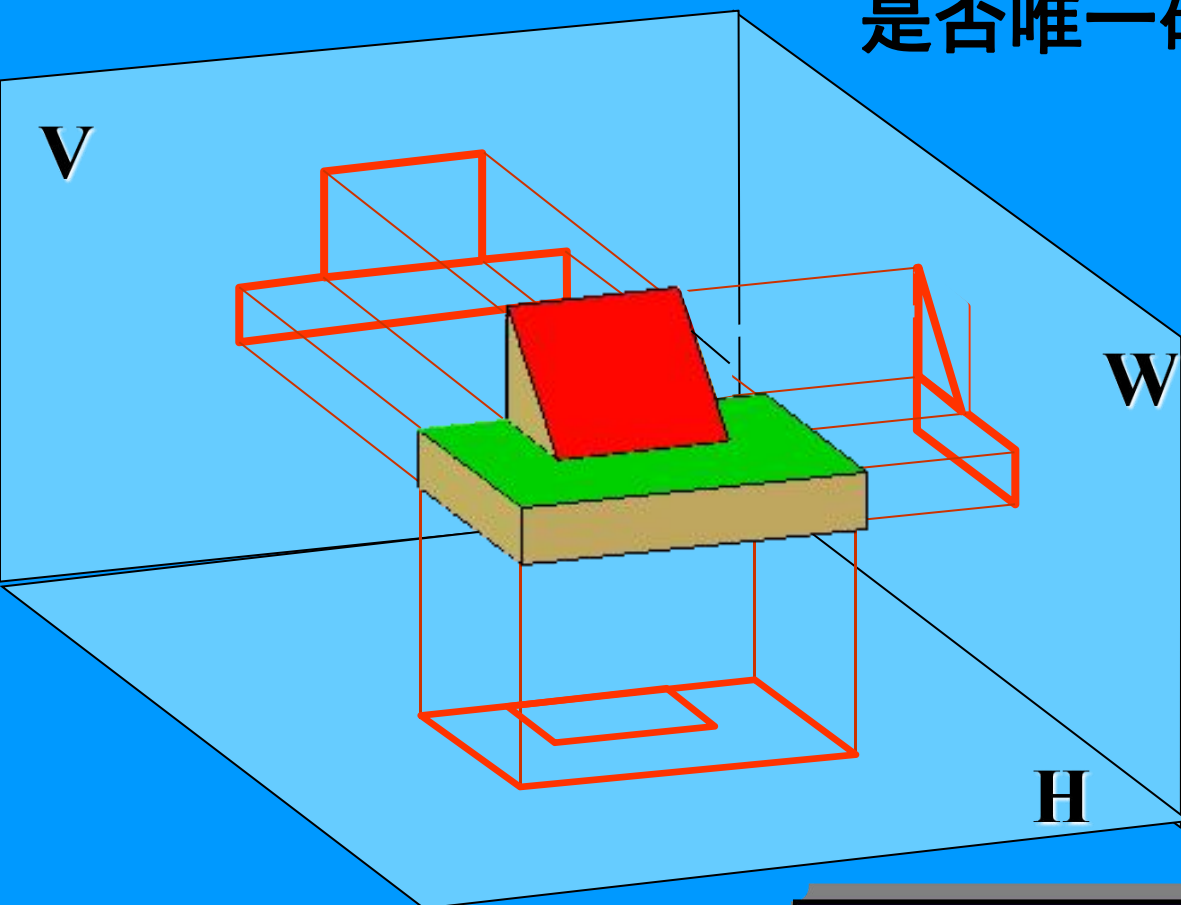
物体的两面投影

§ 2-2 三视图的形成及其投影规律

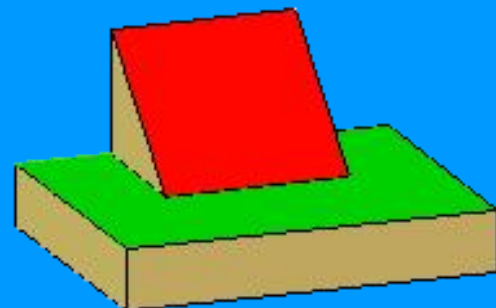
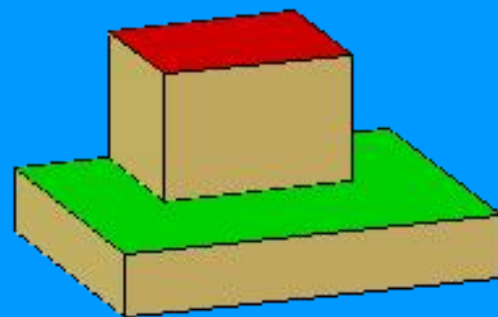
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3、三面投影图

是否唯一确定物体的空间形状？



唯一确定！



物体的三面投影

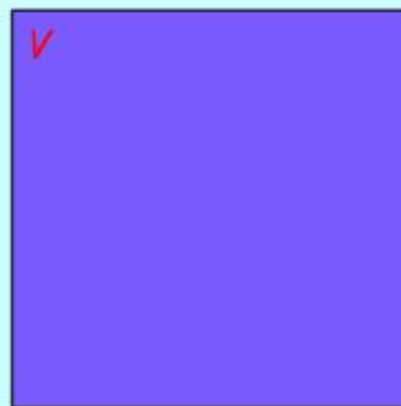
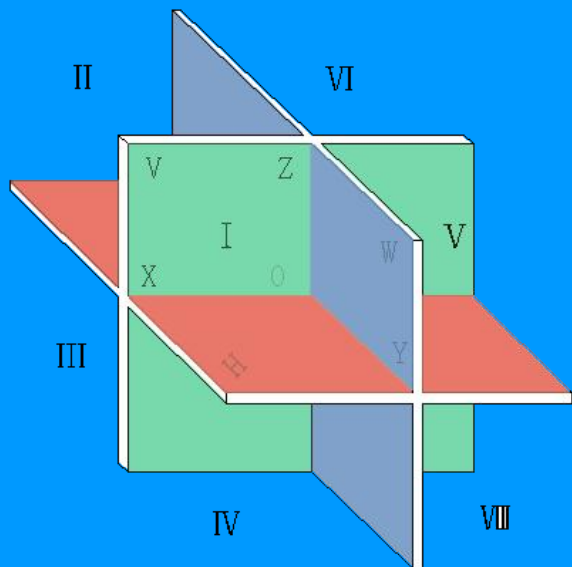
§ 2-2 三视图的形成及其投影规律

律

4、三投影面体系的建立

✂ 设立三个互相垂直的投影平面，构成三面投影体系。这三个平面将空间分为八个分角，(GB4458.1 - 84)规定：采用第一角投影法，

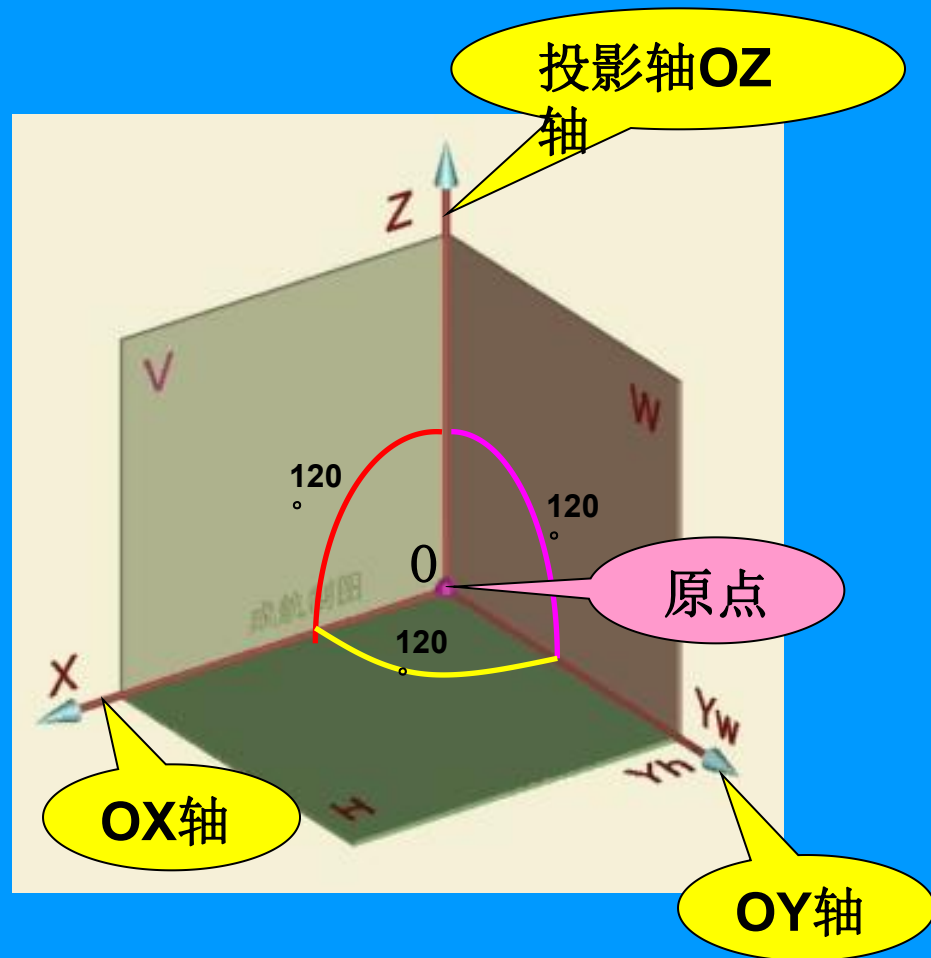
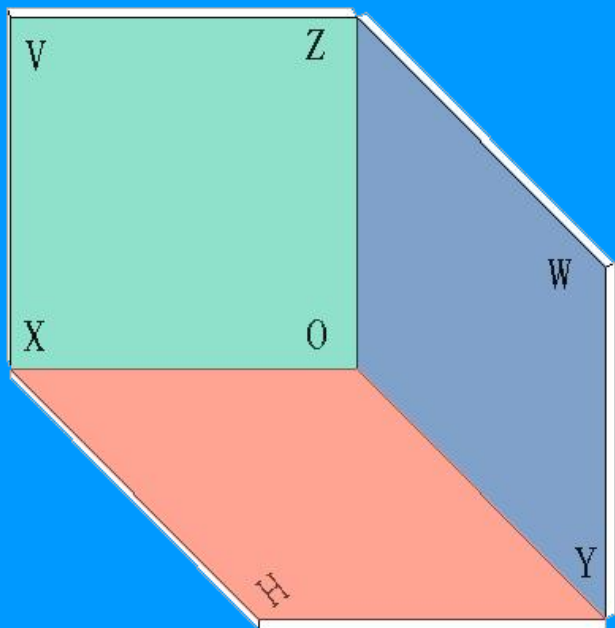
三投影面体系建立过程



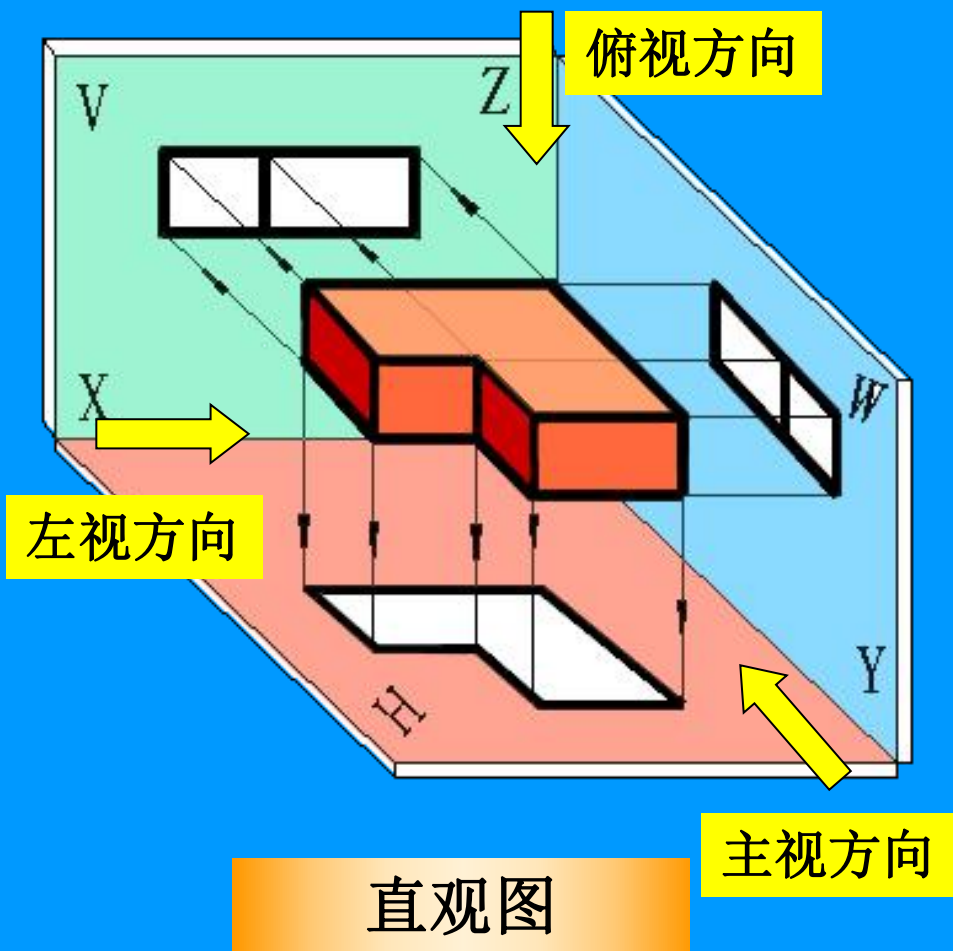
空间分为八个分角

§2-2 三视图的形成及其投影规律

第一分角



5、三视图的形成



主视图：物体由前向后投影，在V面上得到的视图。

俯视图：物体由上向下投影，在H面上得到的视图。

左视图：物体由左向右投影，在W面上得到的视图

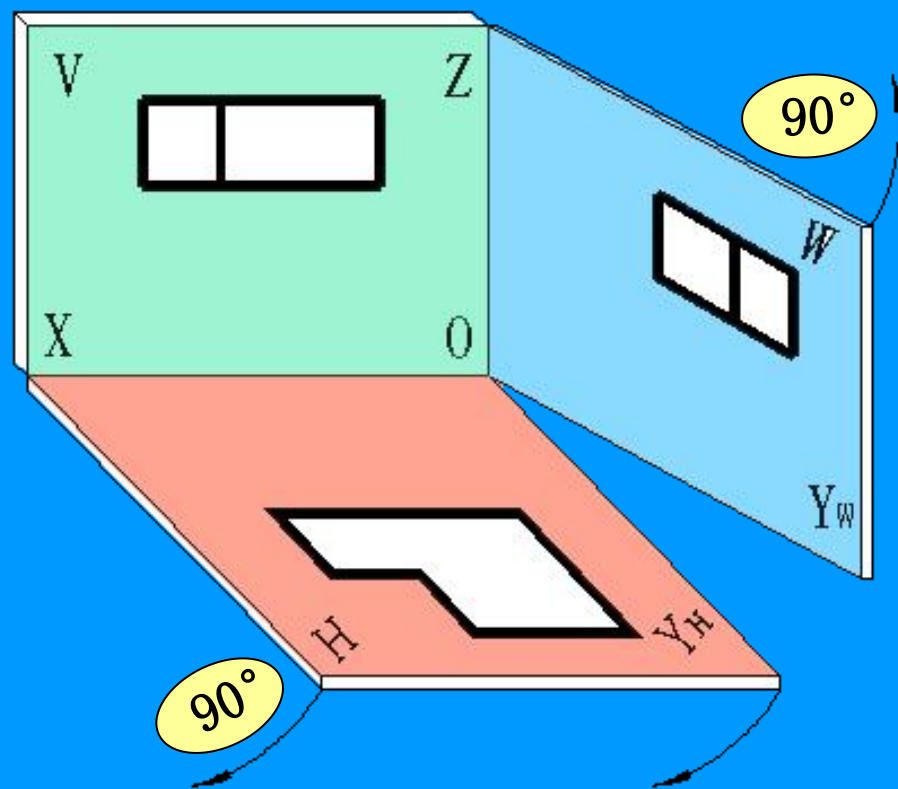
三视图的名称

§2-2 三视图的形成及其投影规律

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投影体系的展开

- ★ 保持V投影面不动。
- ★ 将H投影面绕OX轴向下旋转 90° ，使H面与V面共面。
- ★ 将W投影面绕OZ轴向右旋转 90° ，使W面与V面共面。



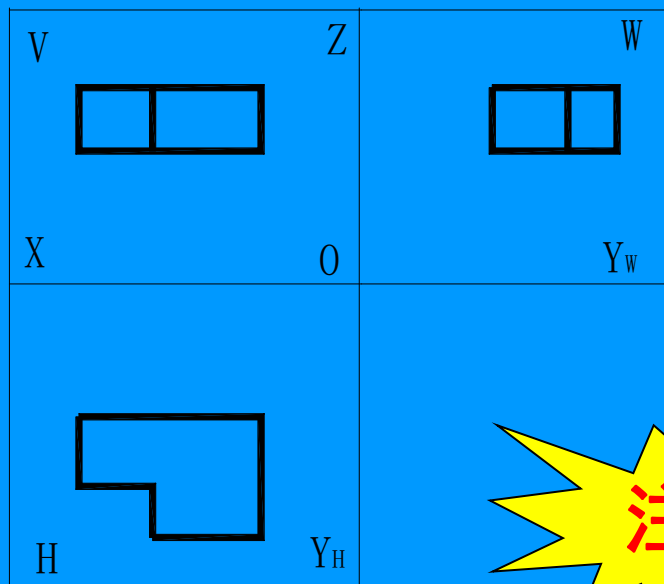
展开投影面

§ 2-2 三视图的形成及其投影规律

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展开后的三视图



三视图

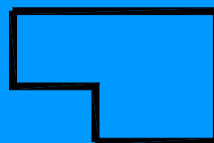
(主视图)



(左视图)



(俯视图)





去除投影

面边框即得：

三视图

注意

 在三投影面体系中摆放形体时，应使形体的多数表面(或主要表面)平行或垂直于投影面(即形体正放)。

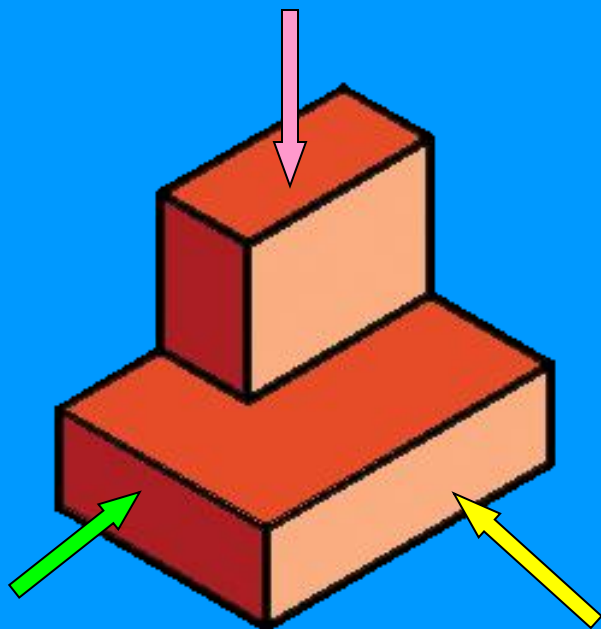
 形体在三投影面体系中的位置一经选定，在投影过程中绝对不允许移动或变更。

§2-2 三视图的形成及其投影规律

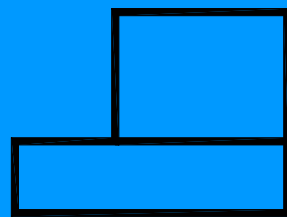
二、三视图的投影对应关系

1、三视图的位置关系

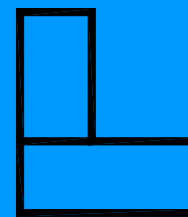
俯视 (产生H面投影)



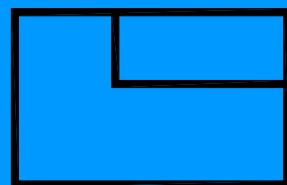
左视 (产生W面投影) 主视 (产生V面投影)



主视图 (V面)



左视图 (W面)



俯视图 (H面)

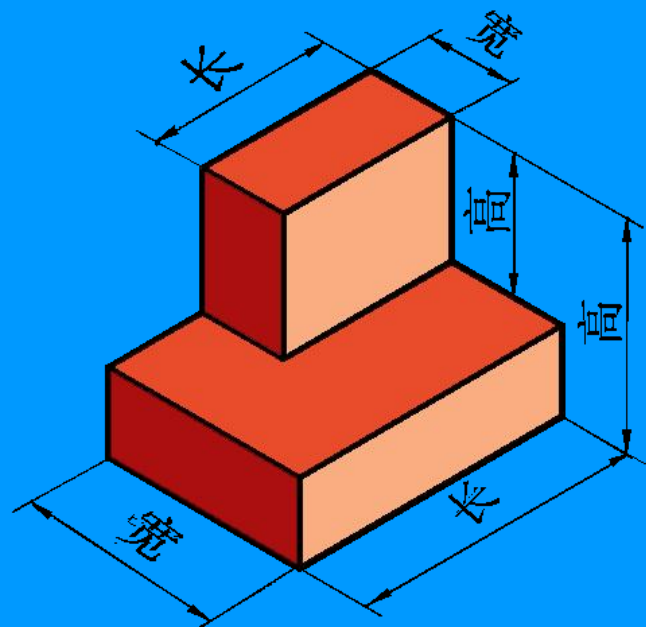
三视图的位置关系

§ 2-2 三视图的形成及其投影规律

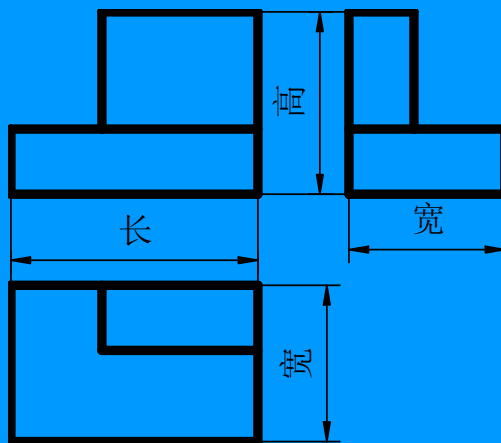
律

V 面投影(主视图)反映形体正面形状及其长度及高度;
H 面投影(俯视图)反映形体上面形状及其长度及宽度;
W 面投影(左视图)反映形体左侧面形状及其高度及宽度。
系, 在一般情况下是不允许变动的。

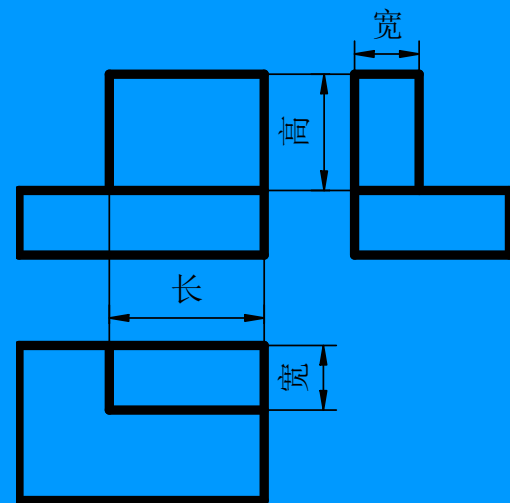
2、三视图的度量关系



直观图



总体三等



局部三等

§2-2 三视图的形成及其投影规律

三视图之间的度量对应关系

主、俯视图长相等且对正
俯、左视图宽相等且对应
主、左视图高相等且平齐

三等关系

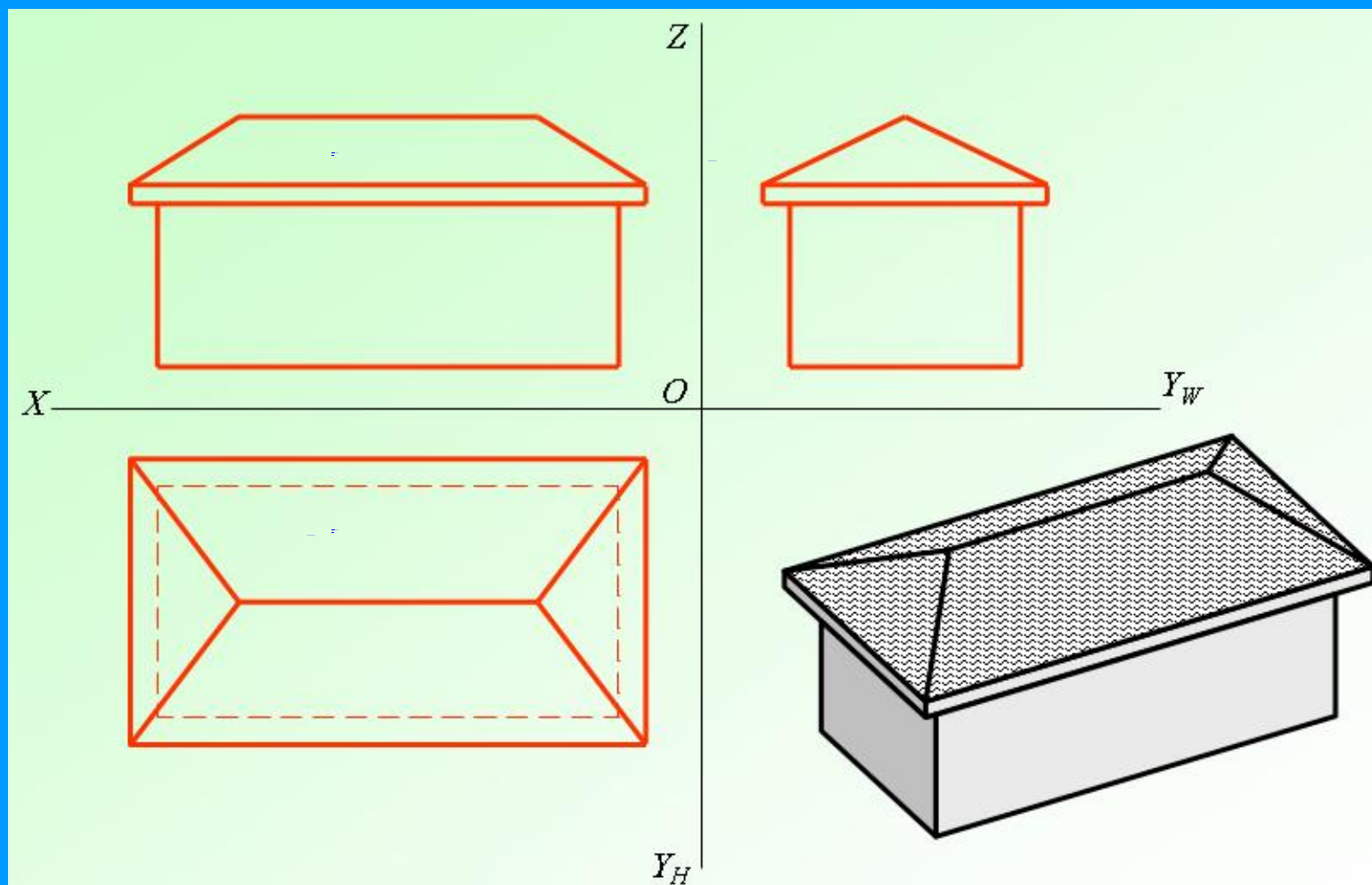
长对正
宽相等
高平齐

三视图投影规律

- V面、H面（主、俯视图）——长对正。
- V面、W面（主、左视图）——高平齐。
- H面、W面（俯、左视图）——宽相等。

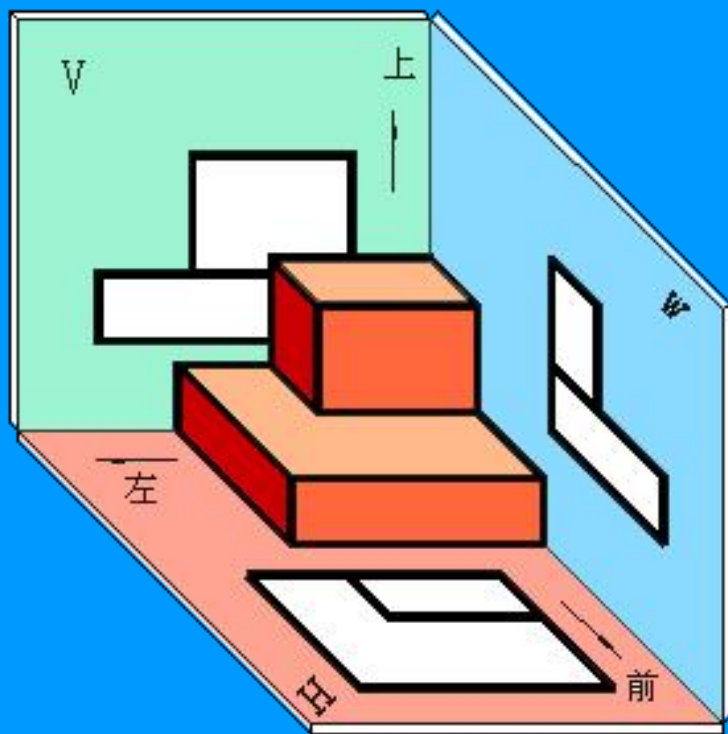
§2-2 三视图的形成及其投影规律

例：四坡屋面房屋的三面正投影



§2-2 三视图的形成及其投影规律

三、三视图与物体方位对应关系



直观图

物体在空间有六个方位：


- 上、下； → 高
- 左、右； → 长
- 前、后。 → 宽


与投影规律有什么关系吗？




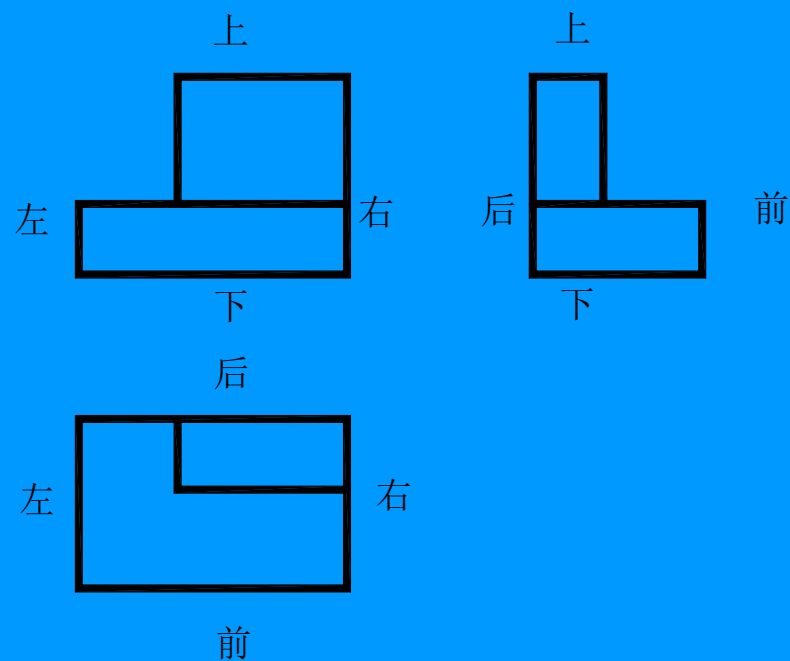
§2-2 三视图的形成及其投影规律

三视图的方位关系

 **正面(主视图)**——反映下形体的**右**
前后的判定必须借助俯位左视图

 **上面(俯视图)**——反映右形体的**后**
上下的判定必须借助左方位左视图

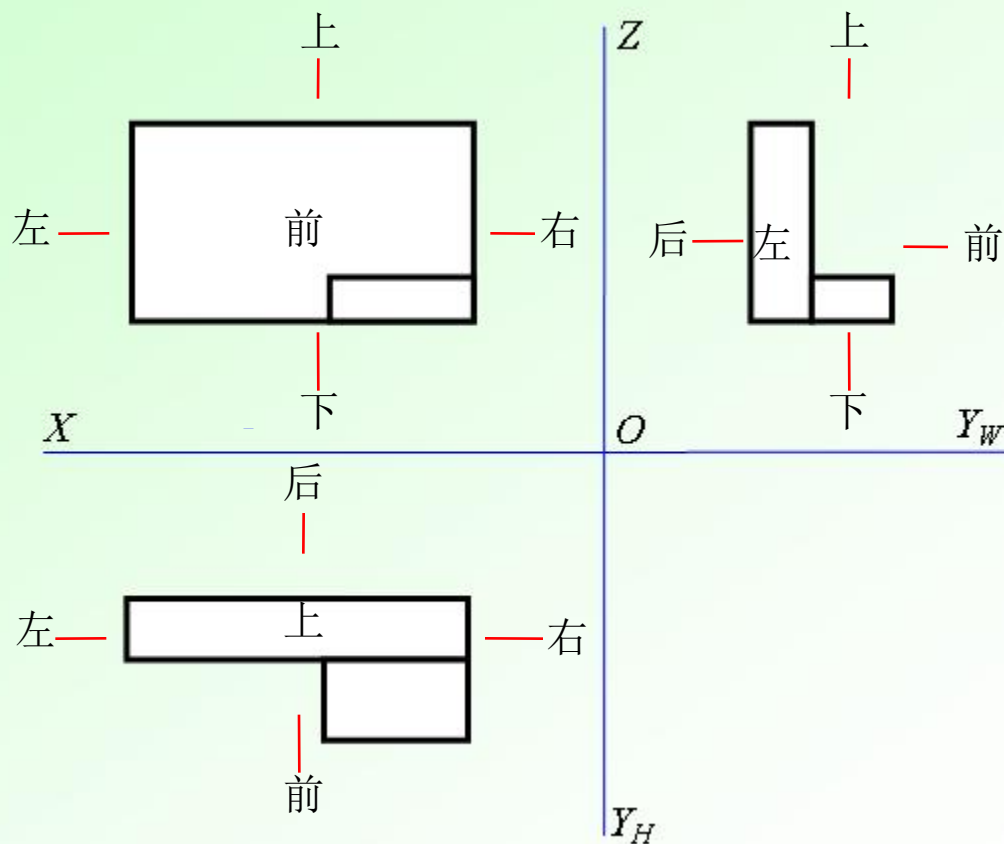
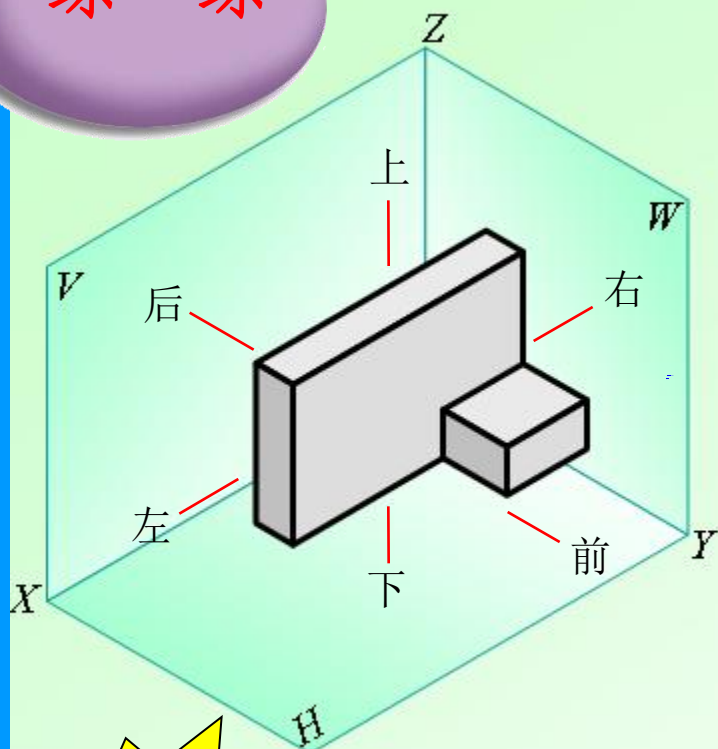
 **左面(左视图)**——反映下形体的**后**
左右的判定必须借助右位左视图。



三视图的方位关系

§2-2 三视图的形成及其投影规律

练一练



牢记!

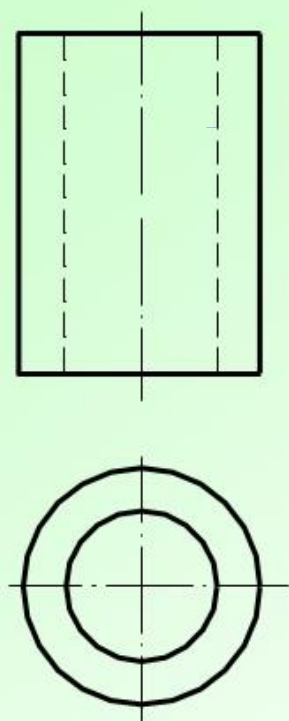
俯、左视图中靠近主视图的一侧为物体的后方，远离的一侧为物体的前方。

§ 2-2 三视图的形成及其投影规律

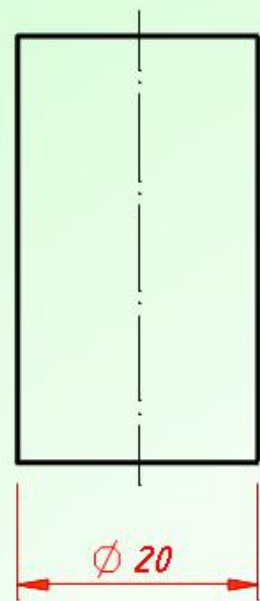
必须说明

有些简单形体只需用两个甚至一个投影图就能表达清楚。

如图中的圆管可用两个正投影表达；圆柱只需用一个正投影图，利用直径符号和尺寸来表达清楚。



(a) 圆管

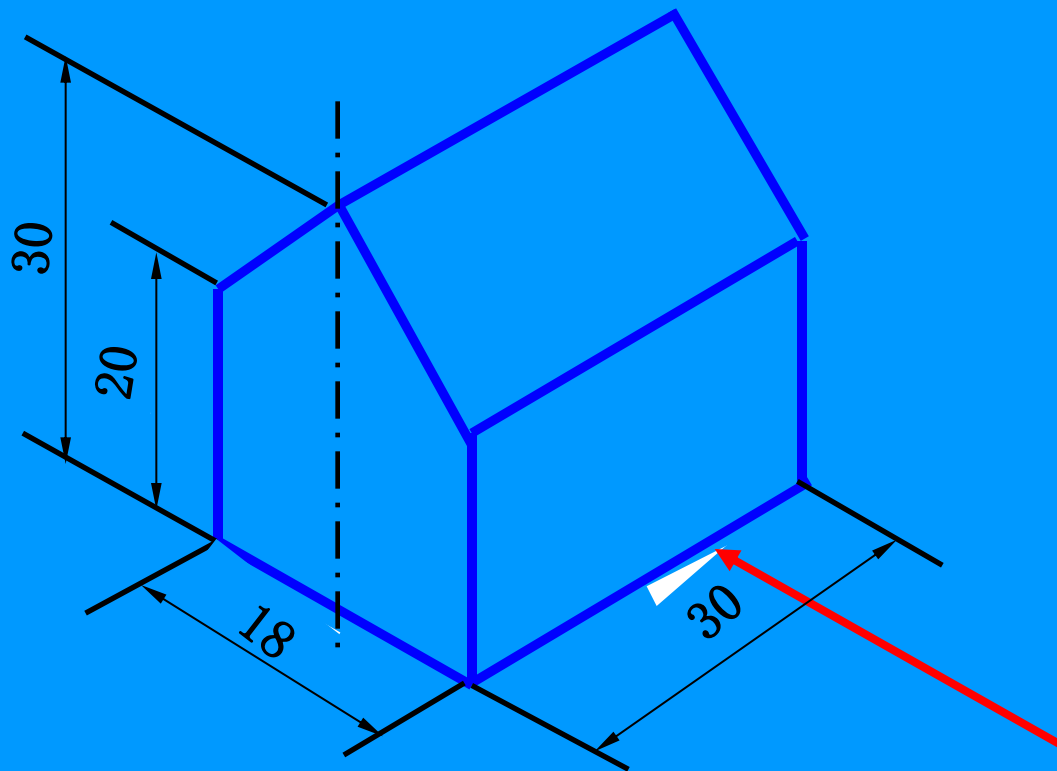


(b) 圆柱

§2-2 三视图的形成及其投影规律

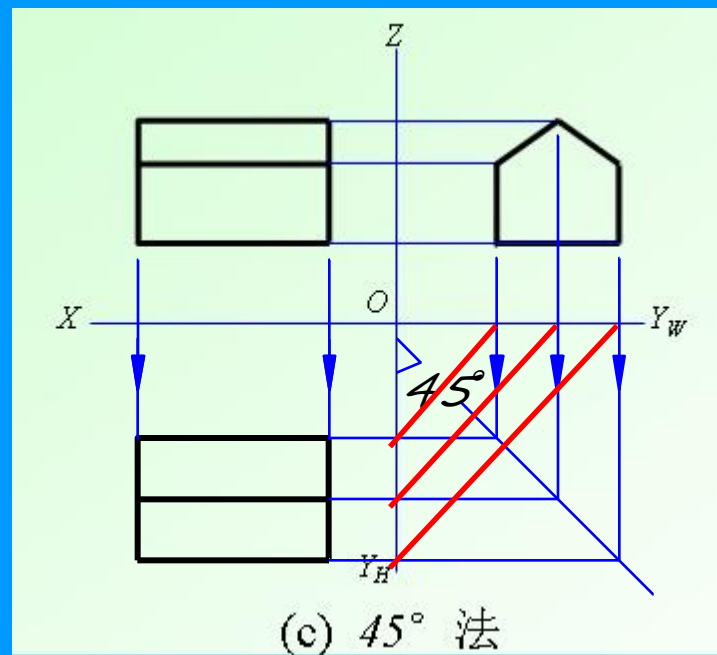
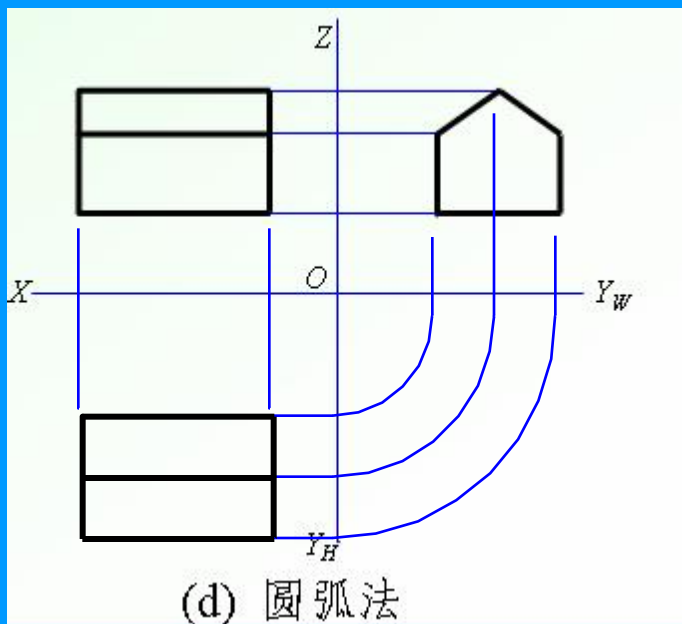
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四、三视图的作图与读图



§2-2 三视图的形成及其投影规律

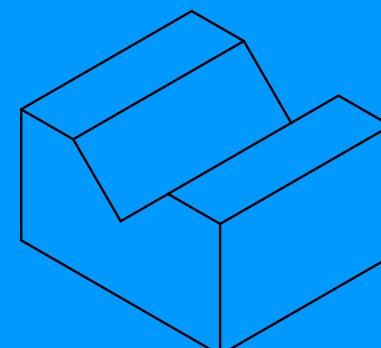
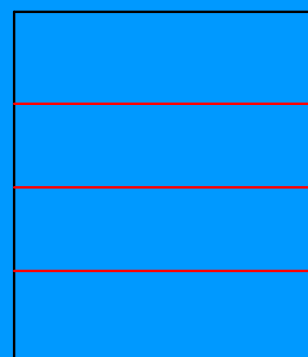
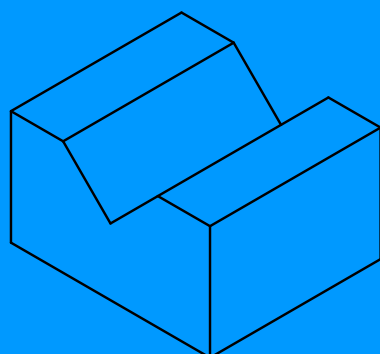
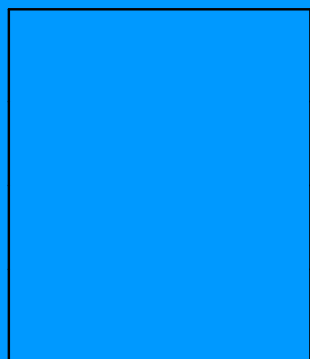
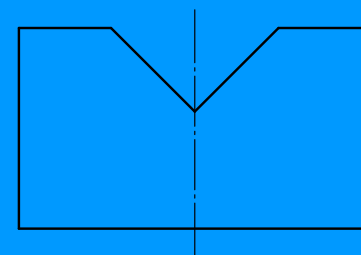
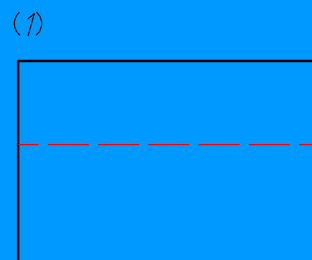
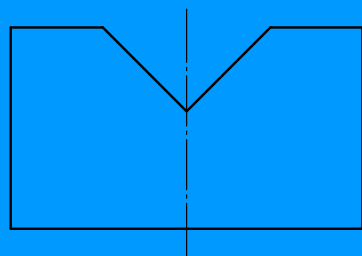
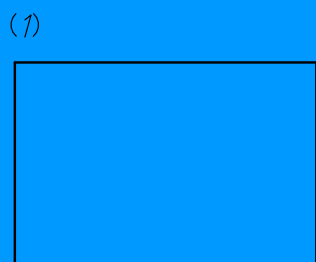
作图步骤:



在有投影轴的情况下，宽相等的保证有三种方法。

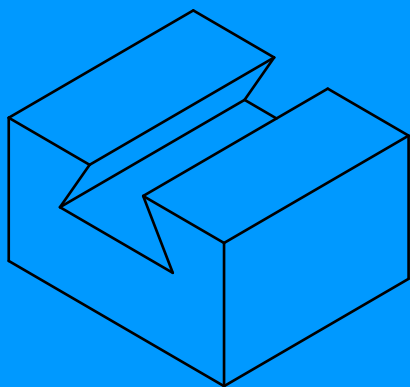
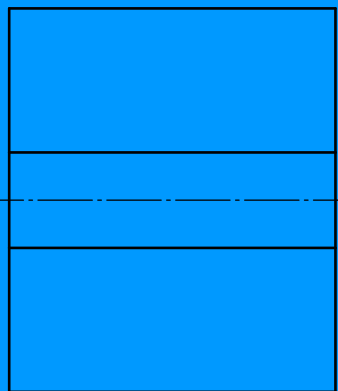
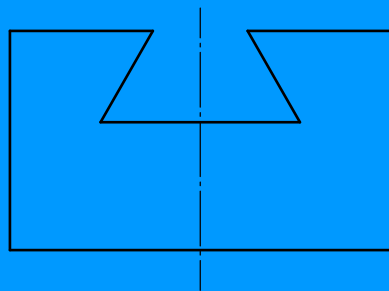
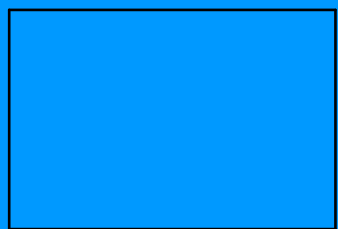


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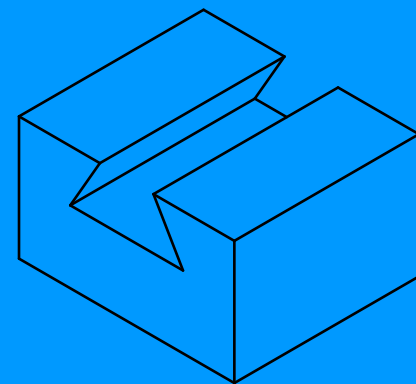
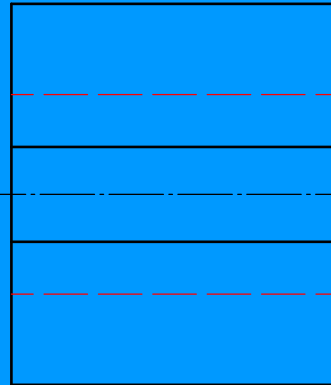
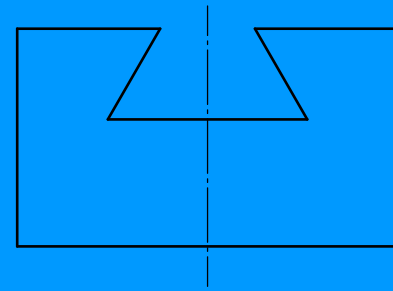
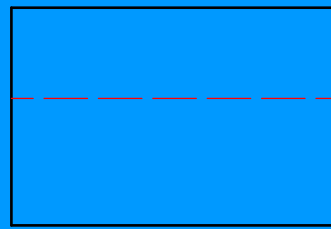


§2-2 三视图的形成及其投影规律

(2)

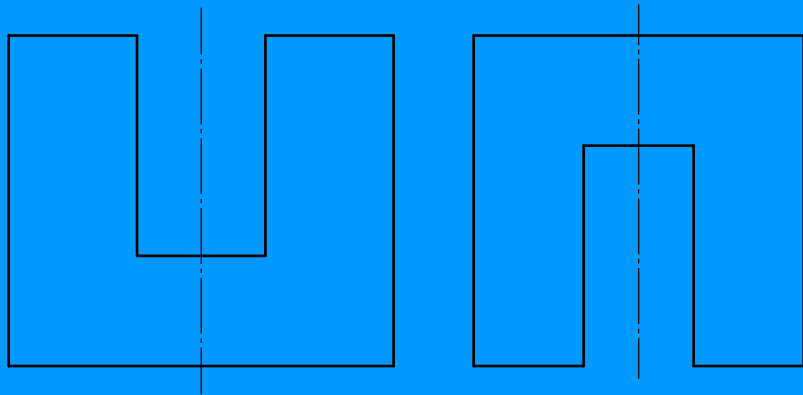


(2)

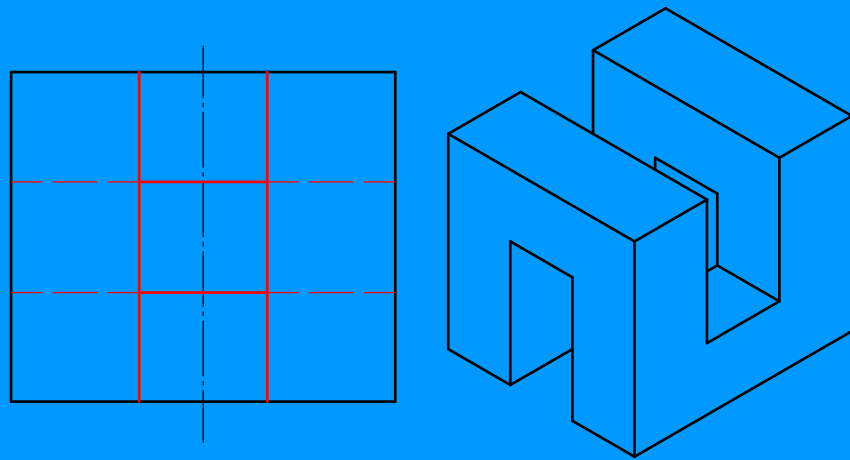
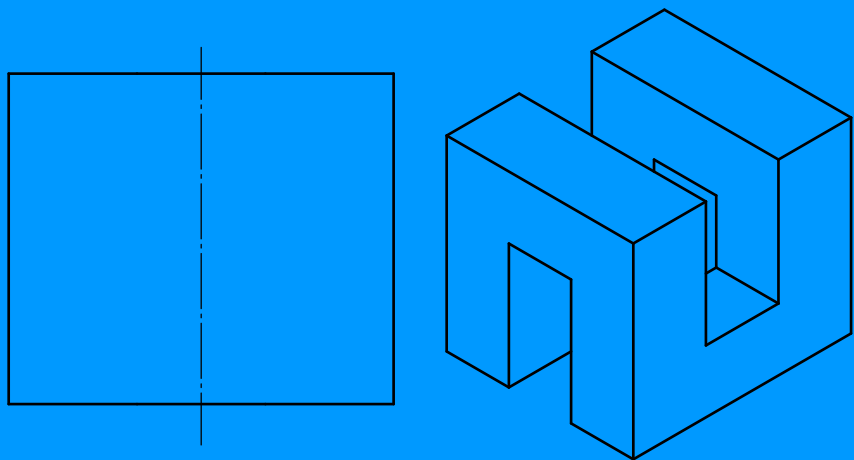
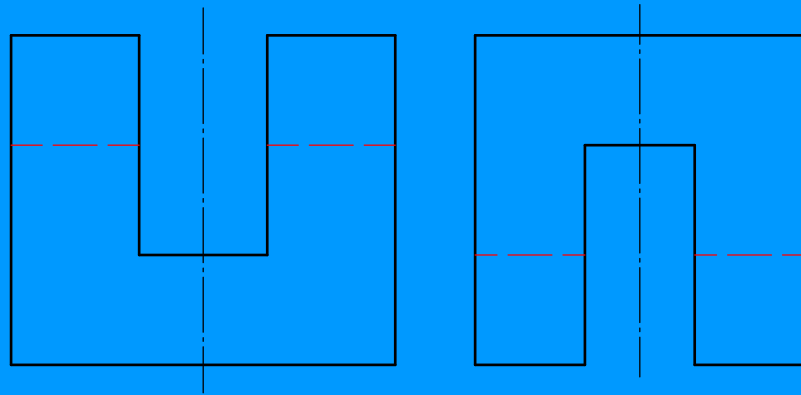


§2-2 三视图的形成及其投影规律

(4)

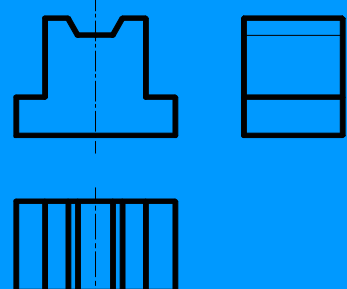
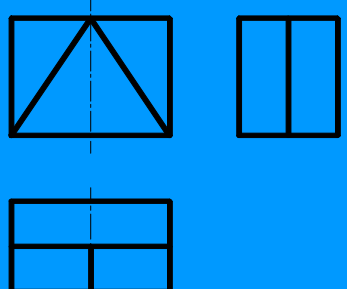
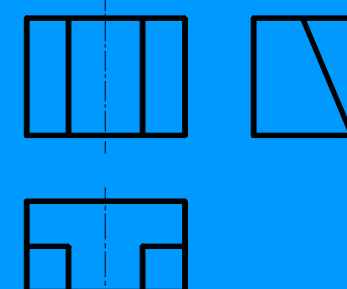
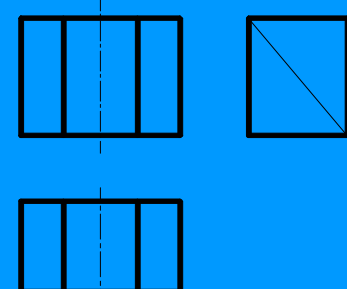
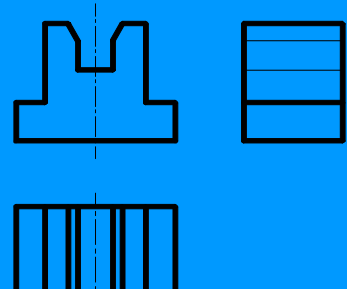
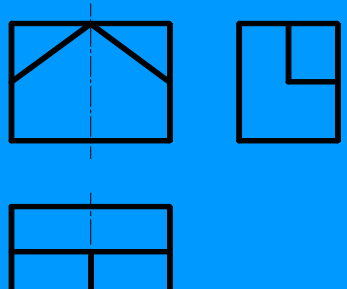
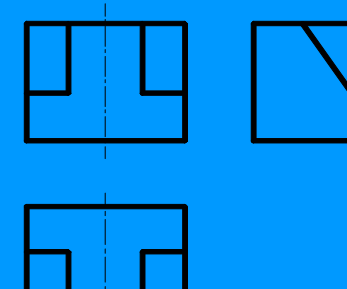
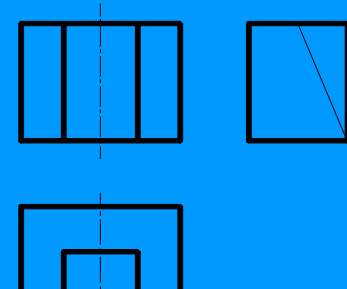

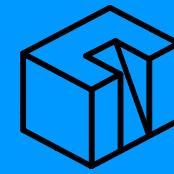
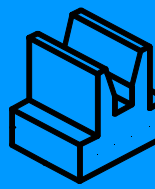

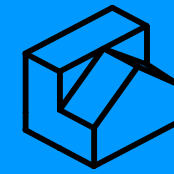
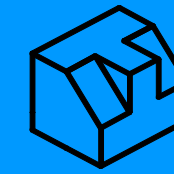
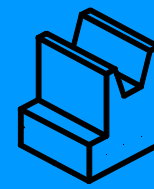
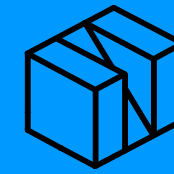


(4)



§2-2 三视图的形成及其投影规律

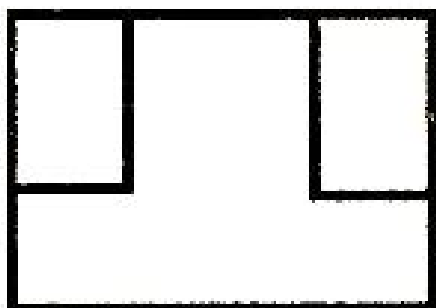
根据物体的三视图，找出对应的立体图

<p>(1)</p> 	<p>(2)</p> 	<p>(3)</p> 	<p>(4)</p> 				
<p>(5)</p> 	<p>(6)</p> 	<p>(7)</p> 	<p>(8)</p> 				
 <p>()</p>	 <p>()</p>	 <p>()</p>	 <p>()</p>	 <p>()</p>	 <p>()</p>	 <p>()</p>	 <p>()</p>

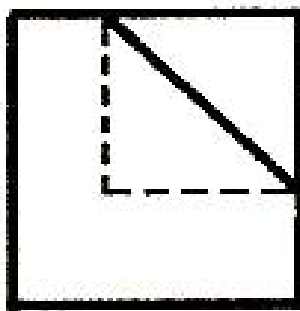
§2-2 三视图的形成及其投影规律

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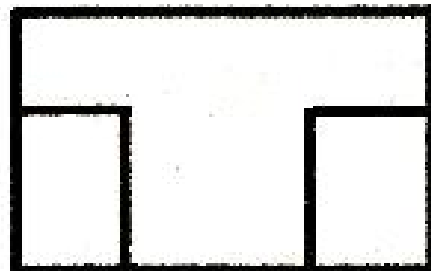
根据如图所示的组合物体，在下列选项
中选出正确的左视图 **B**



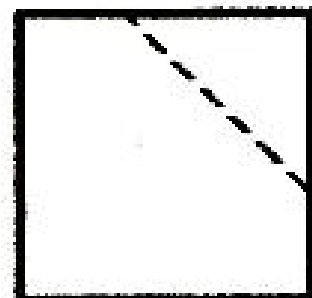
A.



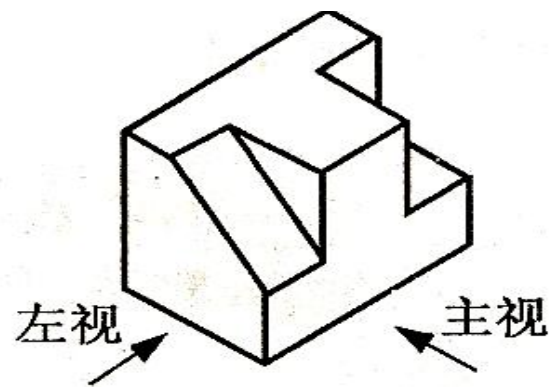
B.

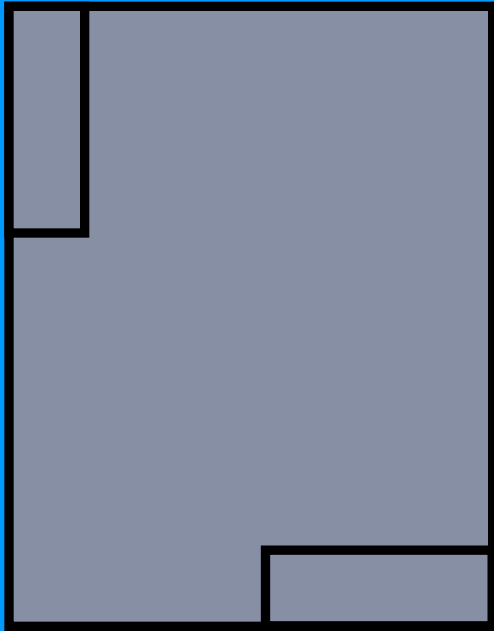
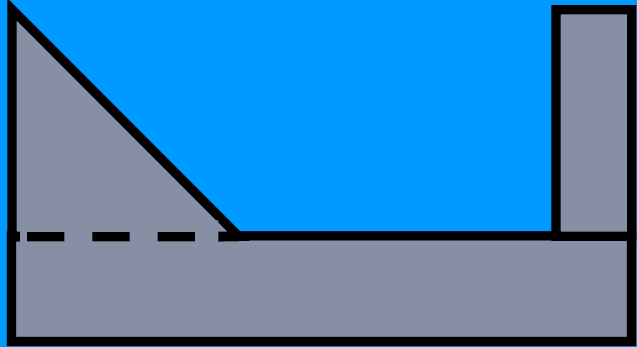
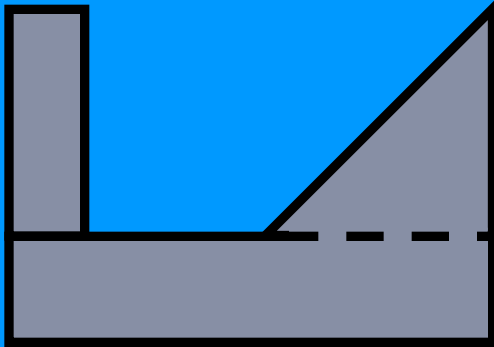
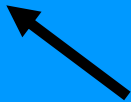
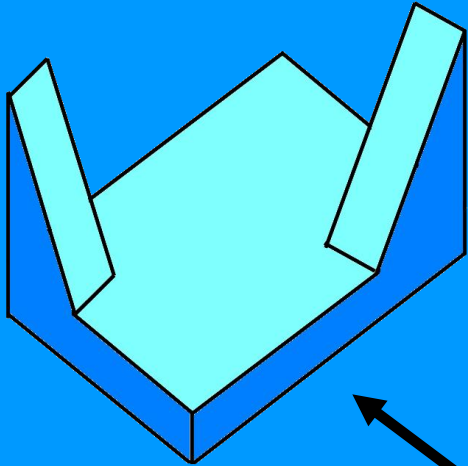


C.



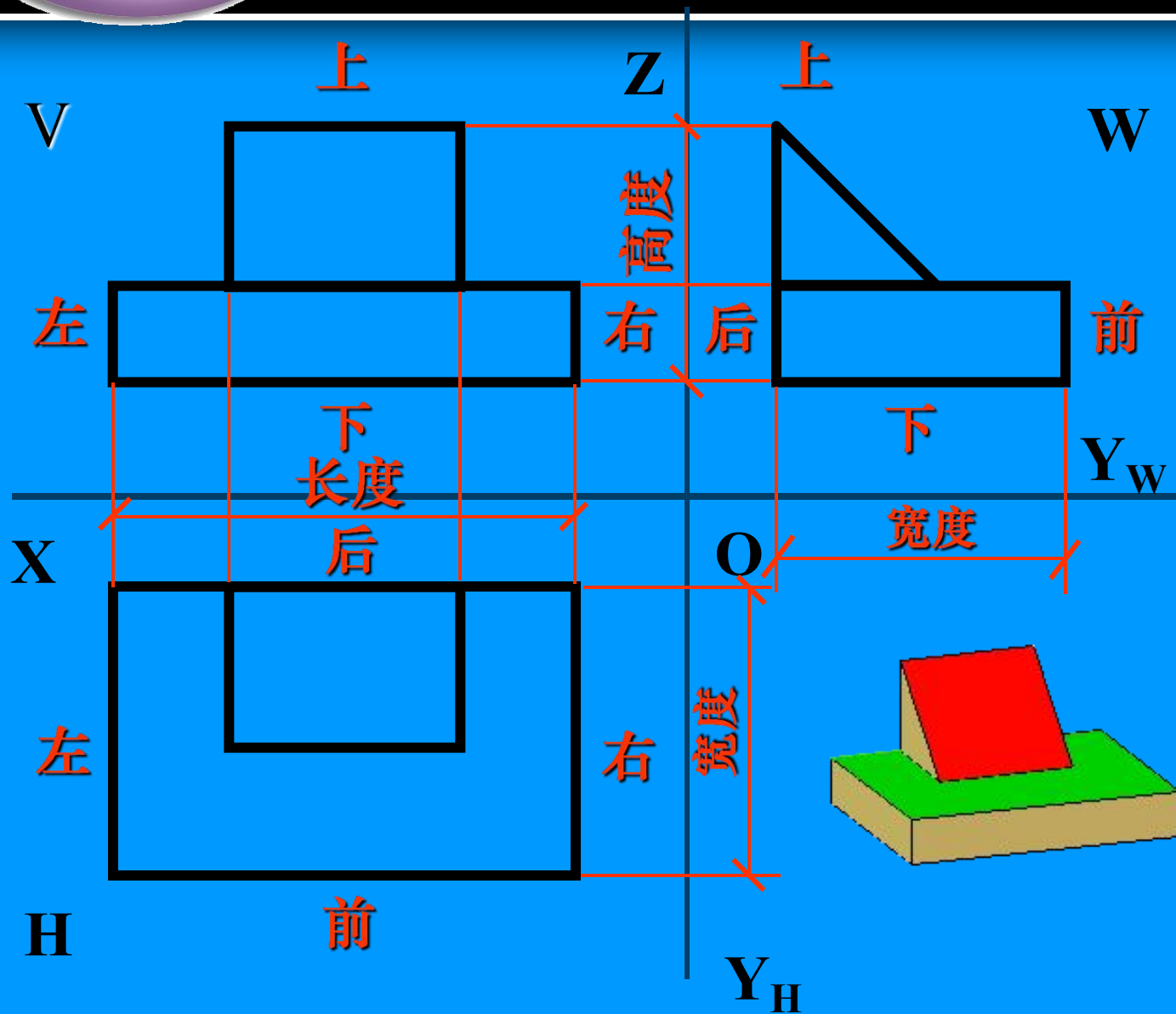
D.





小结

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投影规律:

长对正
高平齐
宽相等

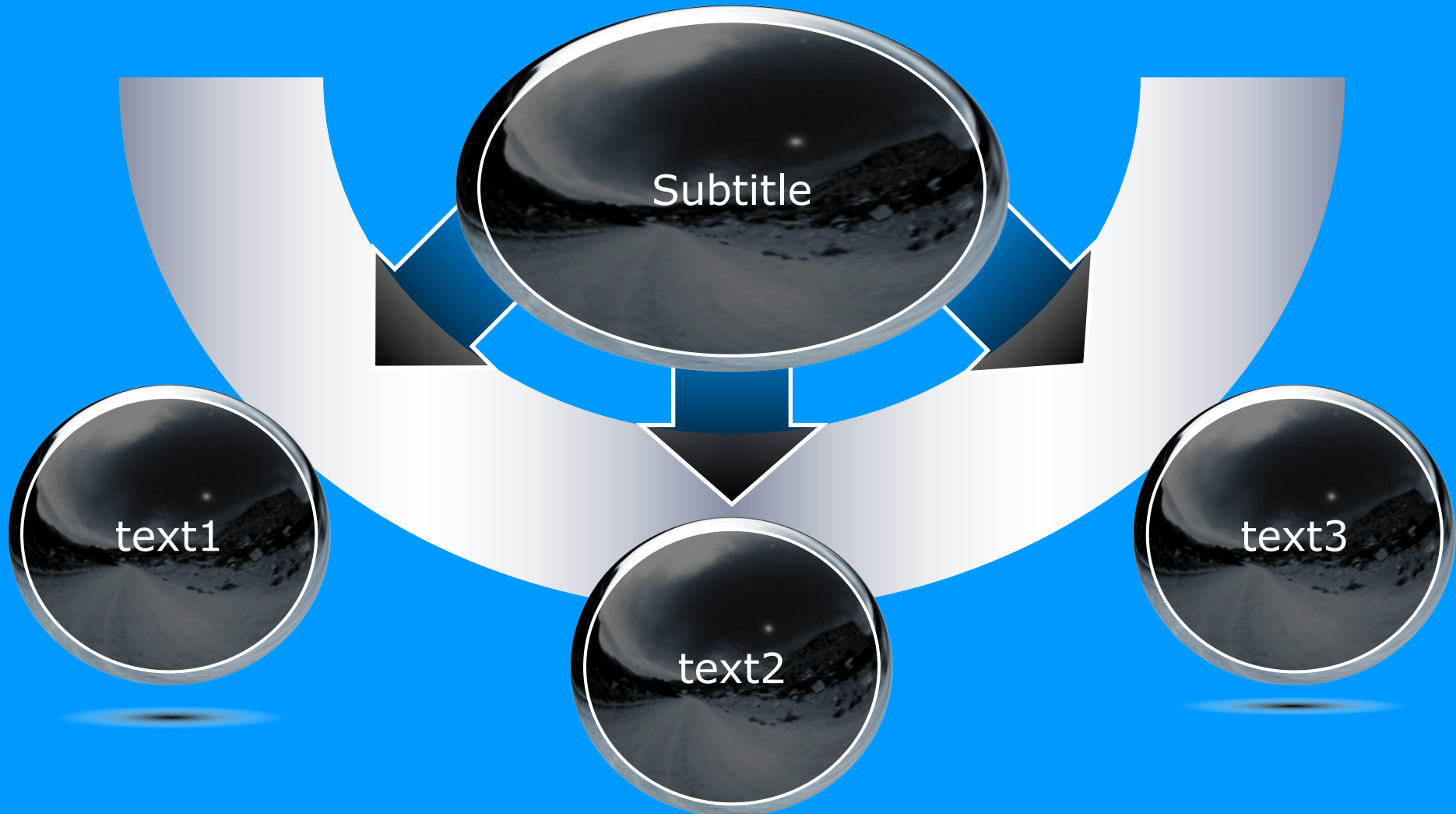
投 视

方位关系:

上下关系
左右关系
前后关系

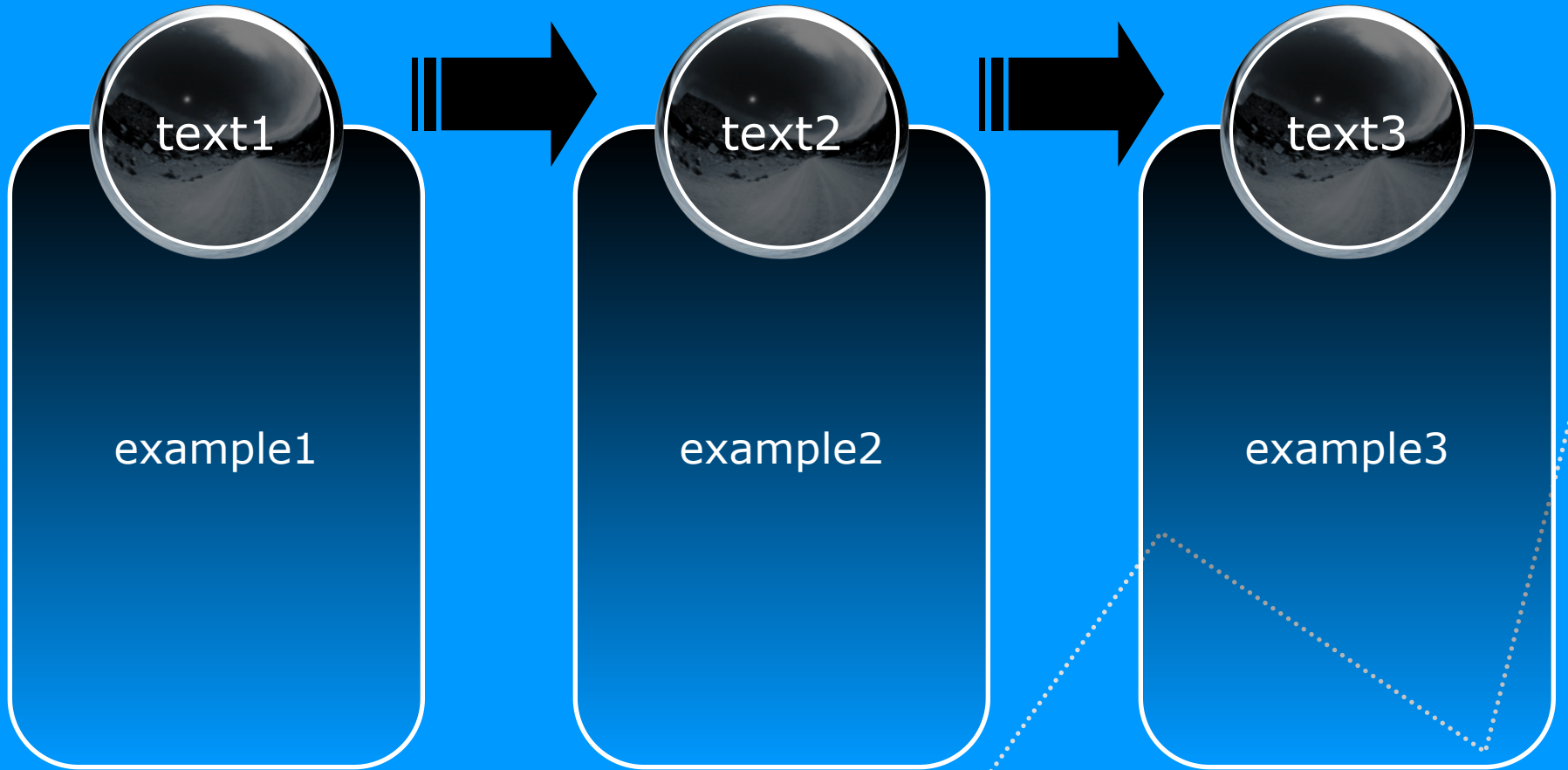
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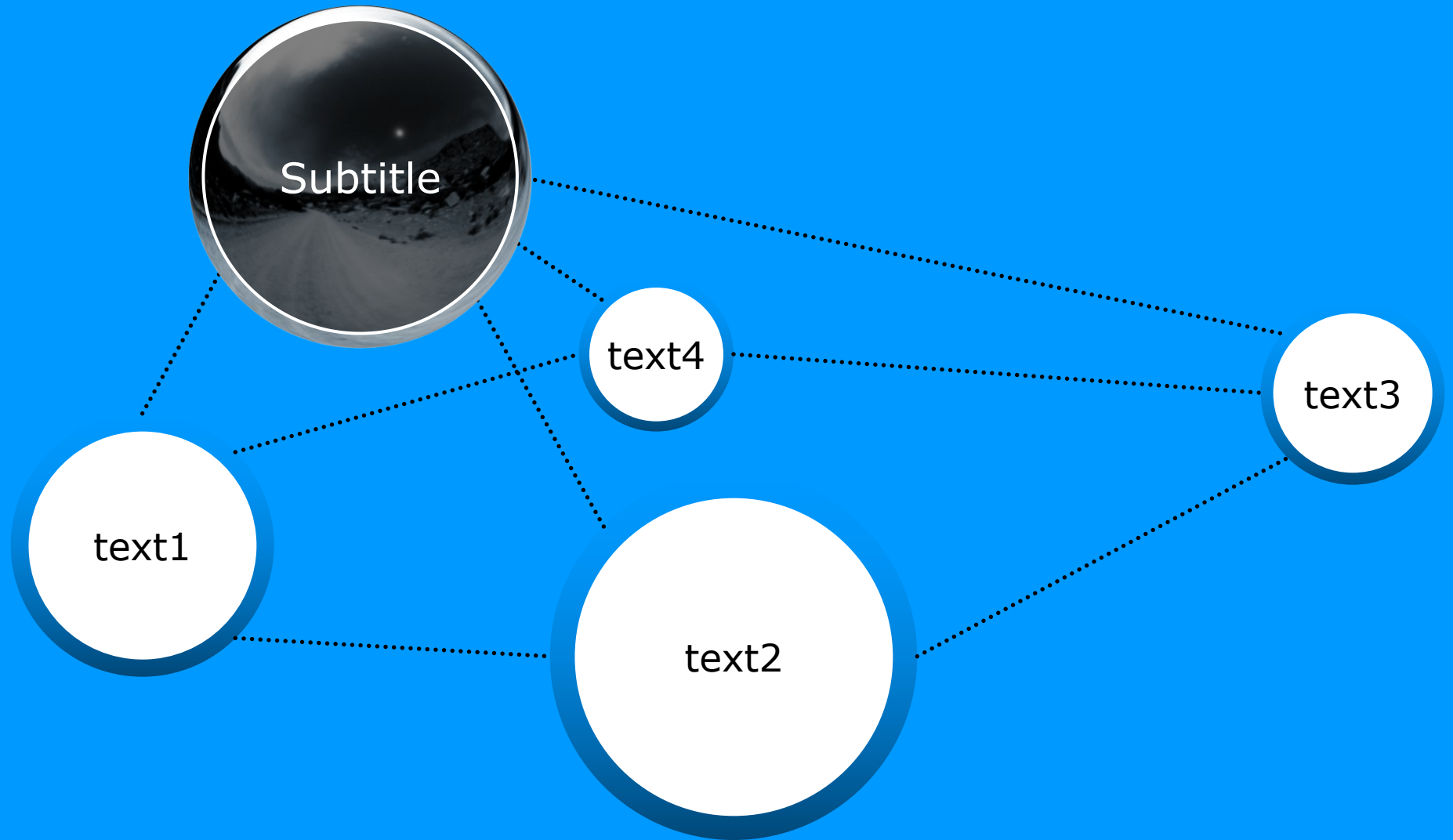
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