5.1 Views of solids

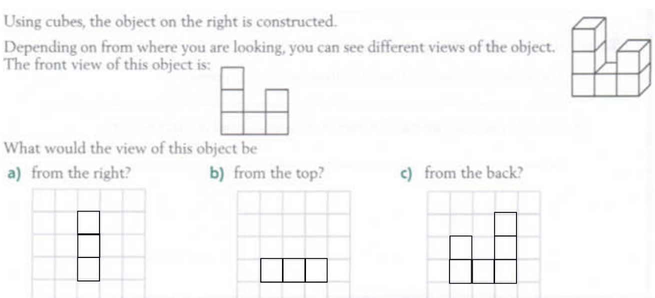
- Spatial sense helps us create, analyze, mentally visualize, classify and transform solids.
- Drawing 3D solids could be challenging but a lot of fun.
- Google:

3D street arts.

Dimensions of Space

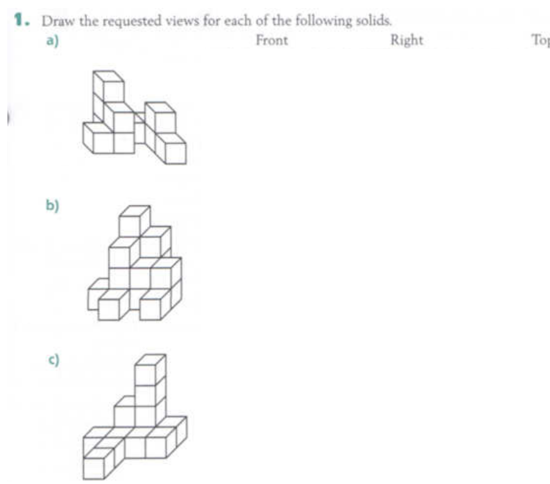
Dimension	Looks Like	Description	Units
0^{th}	•	A single point	No unit
1^{st}		A line - length	$Unit^1$
2^{nd}		A flat surface - area	$Units^2$
3^{rd}		A space - volume	$Units^3$

Views of a Cube (p.150 Activity 2)


Using cubes, the object on the right is constructed.
Depending on from where you are looking, you can see different views of the object.
The front view of this object is:

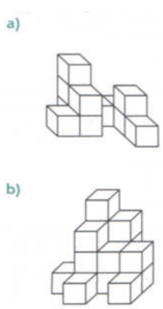
What would the view of this object be
a) from the right? b) from the top? c) from the back?

Views of a Cube (p.151 # 1)


1. Draw the requested views for each of the following solids.
a) Front Right Top
b)
c)

Coded blueprint of a solid:

- (only for the top/bottom view)
- It indicates in each square of the base of the solid, the number of cubes stacked up vertically over it .



Practice:
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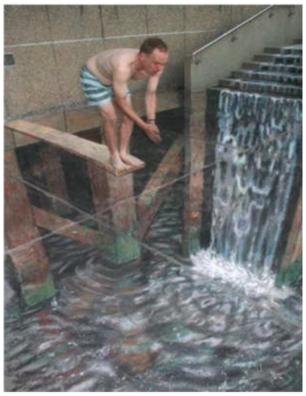
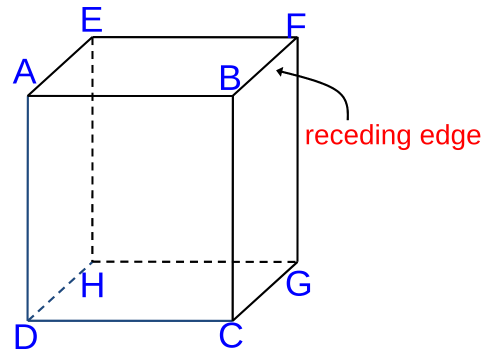
5.2 Perspectives of solids

Three different ways to draw 3D solids:

1. Oblique Perspective
2. Axonometric Perspective
3. Linear Perspective.

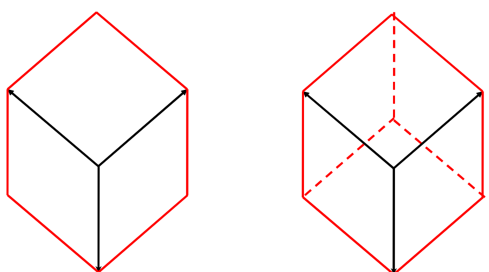


1. Oblique Perspective



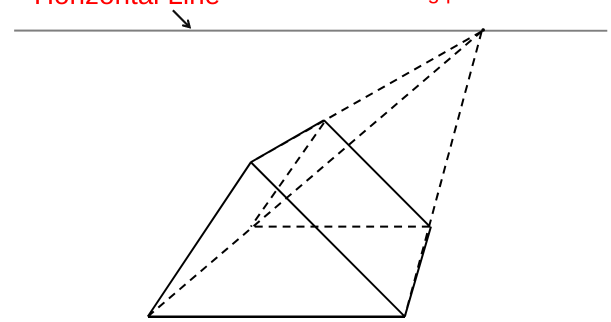
•The face ABCD is parallel with the sheet's plane
•The receding edges are the same length and parallel with each other.

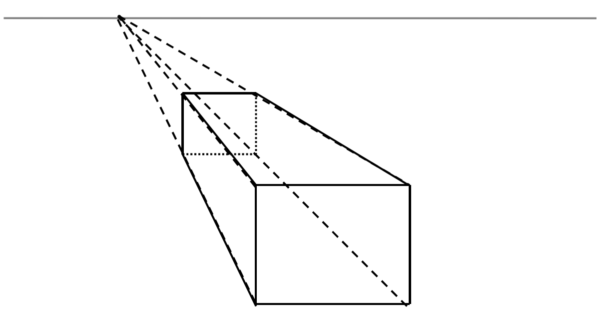
2. Axonometric Perspective



•The edges are parallel to the axis
•Not all edges are necessarily congruent (same length)

3. Linear Perspective





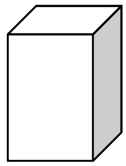
•One of the faces is parallel with the sheet's plane.
•The receding lines meet at a vanishing point.

Practice:
Page 155 # 1-14
(at least one of each)

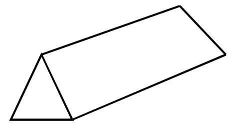
5.3 Geometric Solids

PRISMS

Formed by taking a 2D object and__________________________ it to make a 3D solid.



Square Prism



Triangular base Prism

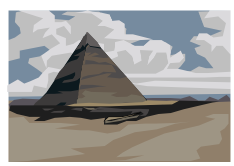
Note: The prism is named after the shape of the ____________ not the __________________

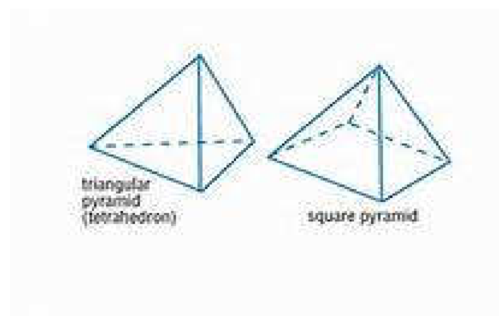
Properties of Prisms:

- has ________________________ that are parallel and congruent
- the _____________________ are perpendicular to the ______________
- the _____________________ is the length of one of the ___________________

PYRAMIDS

The Pyramid is named after the shape of _____________





Properties of Pyramids

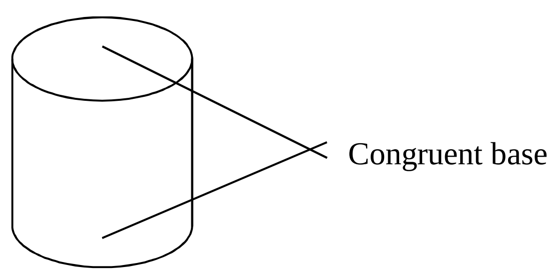
- a _____________ makes the base
- the Lateral Faces are _________________
- the height of each lateral face is called the ____________________
- a pyramid is right when the height from the ___________ touches the base at 90°

CYLINDERS

Generated by taking a ___________________

and dragging it to make a 3D solid;

or by rotating a ______________________.



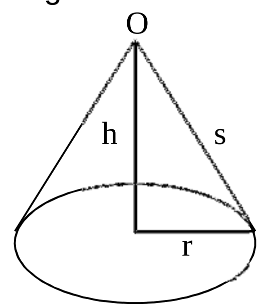
Note: Cylinders can either be _______________ or _______________.

Properties of Cylinders

- two discs with the same radius make the ____________
- the radius of the base is the radius of the _____________
- the height is the distance between the ______________

CONES

Generated by rotating a _______________________ around one of its legs.
It is a curved solid that ends at an ______________.



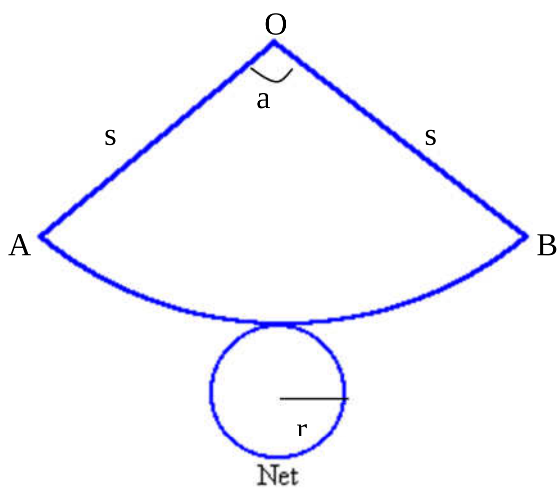
Properties of Cones

- May or may not have a ___________
- Curved surface is called ______________________
- The ______________________ is on the lateral surface
- The ______________ is the perpendicular distance from apex to base

Note: We can use **Pythagorean Theorem** to figure out the radius, height or slant height.
$s^2 = h^2 + r^2$

Net of a Cone:

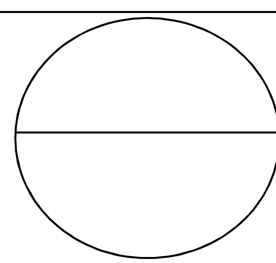
$$\frac{a}{360°} = \frac{mAB}{2\pi s}$$



ALSO

$$\frac{a}{360°} = \frac{r}{s}$$

SPHERES



Generated by rotating a ____________ around its diameter.
All points on its surface are equidistant from the centre.

Properties of Sphere

- any segment joining the centre of the sphere to the surface is called the ____________ .
- Any segment that connects 2 points on the surface of the sphere AND goes through the centre is the ____________.