

# 3D Coordinates Worksheet

## Review: 2 Dimensions

For 2D, we will be working in the XY plane. Hold your plane so that the X-axis is the closest to you, and the origin (0,0) is on the bottom left.

**Activity 1)** On the XY plane, points are described by the ordered pair (X,Y). From the origin, move 4 units to the right, and 1 unit up. This is the point (4,1), meaning we are 4 units out the X axis, and 1 unit up the Y axis. Place a small mark here. From this point, draw a line to (6,1).

Continue drawing lines connecting the following points (take turns):

(6,1) to (8,3) (5,5) to (4,3) (2,3) to (2,5) (8,3) to (8,5)  
(4,5) to (4,6) (4,6) to (3,5) (4,2) to (5,1) (8,5) to (6,7)  
(4,7) to (6,7) (3,5) to (4,5) (6,5) to (7,5) (2,3) to (4,1)  
(6,6) to (6,5) (2,5) to (4,7) (5,1) to (6,2) (4,3) to (5,3)  
(6,6) to (7,5)

Can you tell what it is?

## Next-Step: 3 Dimensions

Now slide your plane down over one of the balsa wood axes. This plane is still the XY plane as it was in the previous exercise, with one difference. The height of this plane can change by sliding it up and down on the axis. The height of the plane is the Z coordinate. The standard form for 3D coordinates is (X,Y,Z). To locate a point, go to the point (X,Y) on your plane, just like above, then slide the plane to the height Z on its axis. Now take turns finding the following points and show your instructor to make sure you're right.

**Activity 2)** Find the following points. Example: to find the point (1,2,3), go to the point (1,2) on the XY plane, and then raise the plane to a height of 3.

Points: (0,0,0) (1,1,1) (4,2,10) (0,4,0) (0,0,6) (0,2,3)

**Activity 3 <Challenge Activity!>** WRITE points for the corners of a cube with its corner at the origin (0,0,0). The first two points have been done for you:

(0,0,0)                      (     ,     ,     )                      (     ,     ,     )

(3,0,0)                      (     ,     ,     )                      (     ,     ,     )

(     ,     ,     )                      (     ,     ,     )                      (     ,     ,     )