Week 10  Spatial Illusion and Perspective: In this lesson you will learn how to use perspective in your drawings and paintings to create the illusion of depth. Perspective allows you to trick your eye to see an illusion of three-dimensional space on a flat piece of paper.

Terms, Definitions and Abbreviations of Perspective used in the Following Illustrations:
Viewing Point: The place where you are, your eye level.  
Viewing Angle: The place where you are, your eye level and the angle from your point of view.  
Viewing Height: The place where you are, at your eye level and height or elevation.  
Horizon Line: That place where the land and the sky meet.  
Picture Plane: A make believe paper or canvas between you and the work you are illustrating.  
Vanishing Point: The single point on the horizon where all the lines on the ground level seem to be coming together.  
Single Point Perspective: A single vanishing point on the horizon line.  
Double Point Perspective: Two separate vanishing points on the horizon line.  
Triple Point Perspective: Two vanishing points on the horizon and one in the sky or on the ground.  
Light Reference: The point where your light source comes from for example the sun or a lamp.  
Shadow Vanishing Point: A point directly under your light reference and on the horizon line or on the ground.  
Foreshortening: To shorten the lines of (an object) in a drawing or other representation so as to produce an illusion of projection or extension in space.
Single or One Point Perspective
In single or one-point perspective all the lines in an object or drawing will vanish at one point at the horizon line. (See figure 1) It doesn't matter where on the drawing you place the horizon line or where the object will be placed. We only use the one vanishing point on the horizon line. (See figure 2)

In figure 2 we are looking even with the vanishing point. So our viewing point will be the same. Now lets change the viewing point to place the horizon line through the bottom box. In figure 3 you can see the dramatic effect this has on your drawing.

Notice how each box seems to change just by changing the viewing angle or elevation. They would change even more if we moved the viewing point to the left or right of center on the horizon line. Try it and you will see. In the next illustration you can see your point of view for double or 2 point perspective. We are looking at the edge of a box (height of the object only) with the vanishing points off to each side (the sides of the box) on the horizon line. In single or one point perspective you are looking at the flat side of the box or object whatever it may be. For our demonstrations we will be using the box. But you can think of it as a house, building, car or any other object you want.

Double or Two Point Perspective
In figure 4 we can see that our VIEWING POINT is from above the object and that our vanishing points are off to each side of the box. Therefore we are tricking our eyes to see the drawing of the box as a three-dimensional object with some depth, rather than a drawing of a box that is flat. See figure 4a.
In figure 4a we can see that just by drawing equal sides of a box at an angle will not fool the eye into seeing the box as a three-dimensional object. This is how most of us drew our first boxes and how some of us are still doing it. That is why perspective is so important to the artist, illustrator or draftsperson.

However in figure 5 you can see that there is a perceived mass to the piece. It can hold your imagination and create a yearning to look around the box or open it to see what is inside. How do we know where to place the vanishing points?

In this drawing there is an additional drawing plane, which represents your paper or drawing surface. The reason for putting the vanishing points outside of the drawing plane is that if we put them on the paper we could create an illustration that might look deformed or askew.
Let's do the drawing again this time putting the vanishing points inside the picture plane. See figure 6a.

Notice the difference between the two drawings. Now think of these boxes as buildings with sidewalks and trees. You can see that the bottom one (Figure 6a) that the angles are a bit extreme but still interesting and maybe desirable depending on the type of work you want to portray. You might want to make a more dramatic scene if this were a full-blown drawing. However you might want to be more realistic for an architectural drawing. It just depends on you.
**Triple or Three Point Perspective**

Why would you use three-point perspective? Isn't two enough? The answer is going to surprise some of you. You can have an infinite number of vanishing points in any scene. Look at any photograph from a magazine and take your ruler and start to draw lines to each of the vanishing points in the photo. You will see many vanishing points from the horizon line to other places off into what seems to be space.

Let's look at Figure 8 and we can see that the horizon line on the bottom is easy to see, but why the vanishing point in the sky so to speak. Imagine walking down a main avenue in NYC and looking up and around at your surroundings. Imagine how many other structures might warrant Triple or Three Point Perspective approaches. See figure 8a.

Let's assume that we are starting a drawing of a lighthouse from the water point of view. Also assume there is a large rock formation that the lighthouse is sitting on. So we are looking at it from the water (horizon) line below the rock formation up to the lighthouse. Using Figure 8 as the basis for our drawing let's begin the lighthouse. This is a very quick sketch of a fictitious lighthouse but you can see where three-point perspective can come in handy.

**Multi Point Perspective**
And now for the crazed perspective approach…There are times when you will have many vanishing points in a drawing. When drawing roads or paths, city or country-scapes and any time that you will have multiple changes in direction or in elevation within your work you will need to ‘map’ out the various directions. The grey lines indicate the ground plane; the way of knowing how wide the change in direction should be for the road in this illustration.