

Perspective – the Illusion of 3D

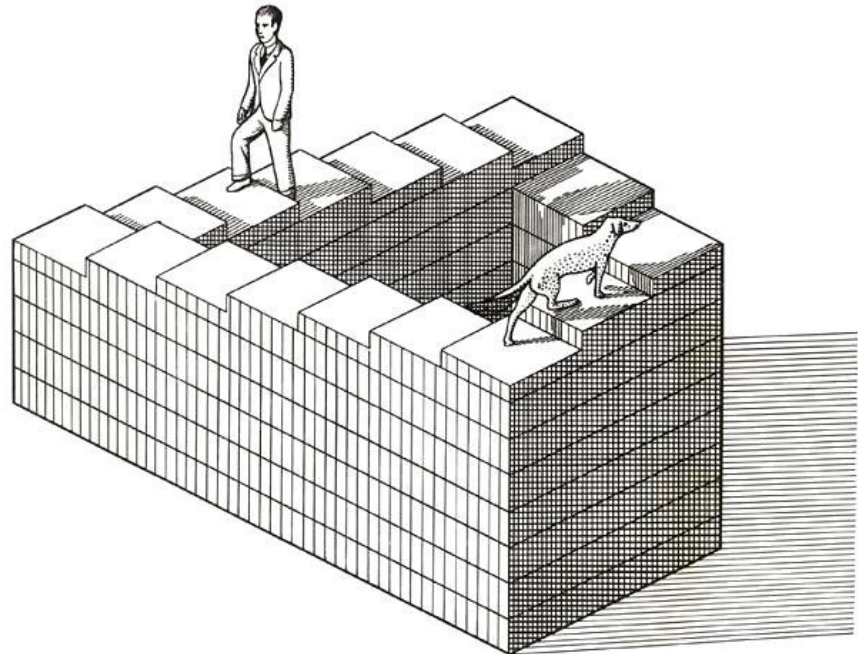
Climb the stairs!

Wait a minute...there's something funny going on here!

The endless staircase is an example of an impossible object. But if it's impossible, how is it possible to draw it?

The drawing was created using perspective distortion. It makes sense to us because our brains are focusing on different regions in the picture. Each of those regions makes sense, but taken together they create an impossible situation.

You need an absolute understanding of perspective before you can break the rules to create such illusions.



A modern 'master' of the understanding of perspective is pavement chalk artist Julian Beaver, here pictured with an image of a coca-cola bottle amazingly drawn flat on the ground!

Unlike the staircase image the cola bottle was drawn with a distorted perspective that only clicks into place from **one** viewing position. When the viewing position is correct the illusion is complete and you see it, not as an impossible object, but as a fully 3-dimensional object.

Understanding the basic principals of perspective, and how to apply them will allow you to create the illusion of three dimensions. As you can see from the examples above it is perfectly possible for the eye to deceive the brain. Get it right and the brain is totally convinced..... Exciting eh!!!

Linear Perspective

It seems obvious that the apparent size of an object decreases the farther you get away from it. Surprisingly this has not always been understood. The first written information about linear perspective appeared about 400 years ago. It was in Europe during the Renaissance that the concept of linear perspective was finally formalized.

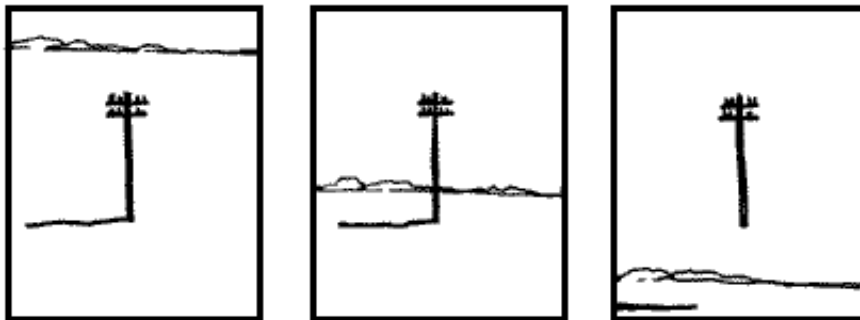
Linear perspective is a system for drawing objects that use lines and vanishing points to determine how much an object's apparent size changes when at a distance from you. There are two types of perspective – Linear, the drawing perspective, and Aerial, the tonal perspective used in painting or shading.

Both systems describe how objects appear in relation to their distance from the observer. This is not so much science as a means of describing, and by interpretation of illustrating, objects in space.

As always start with the eye level

We understood from the **Basic Guide to Landscape Composition** the importance of the eye level. To remind you, take a look at the three drawings below. The same telegraph pole has been drawn in the same position on each. Only the eye level line has been changed.

Can you tell where you are in relationship the the poles?



The first pole is seen from above, the second from normal eye level and the third appears to be floating over your head.

An object's relationship with your eye level shows whether you are looking up, down or straight at the object.

Vanishing points

are points (usually) on your eye level where receding lines (planes) converge. The vanishing point is on the eye level line when an object has horizontal planes that are parallel to the ground. When the object's planes are inclined the vanishing points can be above or below your eye level.



Note in the three drawings above there is only one vanishing point. The telegraph poles, building and railway track are all parallel to each other so they will share the same vanishing point.

Each image been drawn with the most basic perspective concept:

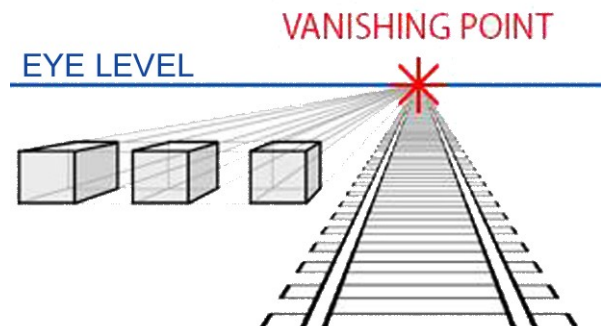
One-Point Perspective

One-Point Perspective (for beginners?)



Leonardo Da Vinci's *The Last Supper* (1495~1498)
perhaps the most famous one point perspective painting of all

One-point perspective images have a tendency to draw the viewer along the lines to the vanishing point. This effect can be used to greater advantage by placing the subject of an image in front of or near the vanishing point. The viewers will more naturally focus their attention because most of the lines in the image converge onto that area. The boxes to the left to the tracks in the one-point perspective example have one face perfectly aligned parallel to the picture plane. This is a limitation of one point perspective. Another problem with this technique is that objects become more distorted the further they are from the vanishing point, as can be seen with the far left box in the example.



Meindert Hobbema
The Avenue at Middleharnis
(1689)

Beautiful example of one-point perspective. The figure placed along the road, near to the vanishing point, makes it the focal point.

The buildings to the right of the trees are placed close to the focal point so the lack of perspective on the end wall is less noticeable. The artist also painted trees in front, hiding the wall a little and thereby hiding the slight distortion.