Perspective Drawing
For Artists & Designers
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Geometry and Art:

What is perspective?

• Perspective, in the vision and visual perception, is: the way that objects appear to the eye based on their spatial attributes; or their dimensions and the position from the eye with relative to their each other. (With another meaning Simply: How can the objects appear for eyes in the different Depths)
Let me try and explain perspective from visual terms. Basically, as lines head into the distance, they converge on a **vanishing point**. A classic example of this is the image of a road that heads straight off to the horizon. The lines on the road converge to a **single point**.

Maybe an image will help:

![Vanishing Point Image]

Here is that classic image of that road. You’ll notice that as the lines of the road head off into the distance, they converge on a **single point**.
The importance of perspective:

1. Add a logic factor, to the elements and objects in design
2. Add a depth with different dimensions, the design work
3. Keeping the true proportions and measuring of the elements and Subjects, in the different dimensions of the design.
4. Perspective triggers movement in the viewers eye, engaging them and drawing them into the work.

And all of these factors together, make your design: perfect, balanced, Successful & So that makes images more interesting of course.
The Types of Perspective:

- There are two Main Kinds of Perspective:
  - 1- Linear perspective
  - 2- Aerial perspective
1- Linear perspective:

- As objects become more distant they appear smaller because their visual angle decreases.

- The visual angle of an object is the angle subtended at the eye by a triangle with the object at its base.

- The greater the distance of the object from the eye, the greater is the height of this triangle, and the less the visual angle.

- This follows simply from Euclidean geometry.

- The Sun and the Moon appear to be roughly the same size because the Sun, although much larger, is also much farther away.
Linear perspective examples:

Look at the Sun & the Moon size here in these images .......

Dr. Reham Karam
Description:

Look at the sizes of Close & Far objects here in these plans .......

Perspective is a Linear function

Meaning... objects that are in alignment, such as telephone poles, get smaller at the same rate as they get farther away.

They get smaller toward the horizon line.
2- Aerial perspective:

- **Aerial perspective** refers to the effect on the appearance of an ordinary object (not a self-luminous object) of being viewed through the atmosphere.

- In daylight, as an ordinary object gets farther from the eye, its contrast with the background is reduced, its color saturation is reduced and its color becomes more blue.

- **Aerial perspective or (atmospheric perspective)**, refers to: the effect the atmosphere has on the appearance of an object as it is viewed in Different distances.

- That is Meaning: when the distance between an object and a viewer increases, the contrast between the object and its background decreases, and the contrast of any markings or details within the object also decreases.
• The colors of the object also become less saturated and shift towards the background color, which is usually blue, but under some conditions may be some other color (for example, at sunrise or sunset distant colors may shift towards red).

• so .. the relationship here between the Distance & (the Contrast + Saturation of colors + clearly) of subject is: contrary.

• So .. according to that, we can say In general: That the Visual perspective is 2 kinds:

  1- One is controlling in sizes of objects ... and that is (Liner perspective)

  2- Other is controlling in (lights & Shades Contrast / colors Saturation / Clarity of Details / levels of tones) of objects (Aerial perspective)
Aerial perspective examples:

Look at the far Objects & the sky colors in these images ……..
Description:

Look at the Degrees of shades & colors for Close & Far objects here in these plans .......

saturation decreases with distance

Distant objects: less saturation

Weaker atmospheric perspective
Perspective Basics:

- Now, we will talk about *Liner Perspective*, which is the main basis of Drawing the outline of design, perfectly.
- *Linear perspective* is a mathematical Geometric system for projecting the three-dimensional world onto a two-dimensional surface, such as paper or canvas or maybe Digital document on any of 2D drawing software (as like: Adobe Photoshop / Adobe InDesign / Adobe Illustrator ...... etc).
Our basics in that Type of Perspective are:

- Horizon Line
- Vanishing Point
- Perspective Lines (Vanishing Lines)
- Subjects outline (which depending on Vanishing lines)

Look at the plan below.
• Look at the Original photography image below:
• You will notice the main outlines of subjects, after treating them by Perspective deals ... All of Incidental lines go in depth towards the central Vanishing point .. But the Existing lines Stands perpendicular on horizon line.
Geometric perspective projection:

- **3D projection** is any method of mapping three-dimensional points to a two-dimensional plan. 
  & with same way, we can - Inversely convert from the 3D Project to just 2D plan.

- As most current methods for displaying graphical data are based on planar (pixel information from several bitplanes) two-dimensional media, the use of this type of projection is widespread, especially in computer graphics, engineering and drafting.
• When the human eye views a scene, objects in the distance appear smaller than objects close by - this is known as perspective.

• While (Orthographic / Geometrical projection) ignores this effect to allow accurate measurements, perspective projection shows distant objects as smaller to provide additional realism.

• There are 3 angles projection, to describe the Object form in perspective Plan:
  1- Plan View .. or Top View
  2- Side View .. or (Lift or Right)
  3- Front View .. or (Face View)

Look at the Image inside ....
• Here we have an Another Geometric Examples about projection .. For Different of Geometric constructions .

• May it contain , some of curves in their forms ... Look at the Images inside for 2 from this examples ....

• But : what every Projection plan keep from information's about the original Shape ?

• 1- Plan View = Measurements of the Widths for construction on the Earth's surface

• 2- Side View = construction heights measurements based on the Earth's surface for each side .

• 3- Front View = Lengths, heights , & details in construction interface .

• Look at the Image inside ....
Full description for 2 Geometric constructions .. (from 3 angles) as Examples about projection ..
Perspective & Isometric or (Orthographic):

- We can easily recognize between (The Perspective construction & The Isometric Construction), that will appear clearly through the way of drawing each one ... & you can look the example below to know: how can each one appear in view:

![Perspective & Isometric Diagram](diagram.png)

- Everything seems equal
- No Vanish-Point
- Parallel lines never touch

- Closest things seems bigger
- Has Vanish-Point
- Parallel lines touch at infinity
Now Look at the Table Data … to know the differences between both:

<table>
<thead>
<tr>
<th>Isometric (Orthographic)</th>
<th>Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closest things seems bigger</td>
<td>No Vanishing Points</td>
</tr>
<tr>
<td>Everything seems Equal</td>
<td>Has Vanishing points</td>
</tr>
<tr>
<td>Parallel lines never touch</td>
<td>Parallel lines touch at infinity</td>
</tr>
</tbody>
</table>
But: what is the Isometric projection?

Isometric projection is a type of parallel projection used for creating a pictorial drawing of an object, where the object is rotated along one or more of its axes relative to the plane of projection.

So and now, we can recognize clearly between (The Perspective construction & The Isometric Construction) even through many & several construction examples .... Look at the visual examples below:
Liner Perspective Levels:

Now, we must now about the Different Levels for Perspective,, There are 5 Levels for Liner Perspective:

• 1- One-point perspective
• 2- Two-points perspective
• 3- Three-points perspective
• 4- Four-points perspective (Bloated or Curved line perspective – المنظور المنتخ أو المنحنى)
• 5- Fifth-points perspective (Globular or Infinite point perspective – المنظور المكور أو اللانهائي)
1- One-point perspective:

- What is One Point Perspective?

One point perspective is a type of linear perspective and it is in the same level of viewer’s eyes. It relies on (withdraw the lines of all shapes in the vision, towards one point only), to render the objects in the depth of space, and form in a flat work of art. It is a structured approach to drawing. One point perspective gets its name from the fact that it utilizes a single vanishing point. Look at the visual examples in the next page.
2- Two-points perspective:

- What is 2 Points Perspective?

- Two points perspective is another type of linear perspective and it is in the same level of viewer’s eyes too. It is a realistic way of drawing objects in 3D. A drawing has two-point perspective when it contains 2 vanishing points on the horizon line and when an object is drawn in this way it is even more realistic than if it were to be drawn with a single vanishing point. 

- Look at the visual examples in the next page
3- Three-points perspective :

• What is 3 Points Perspective ?

• **Three points perspective** another type of **linear perspective** and The biggest difference in three-point perspective is : that there are (Three vanishing points (VPs)). Two are along the horizon, just like two-point, but the third VP is located either above the horizon (at the zenith) or below the horizon (the nadir), depending on the area you intend to draw. ..... The three vanishing points make up a triangle, with the viewer’s center of vision roughly in the middle.

• Look at the visual examples in the next page
4- Four-points perspective:

- What is 4 Points Perspective?
- *Four points perspective ..* (Bloated or Curved line perspective) it is also another type of *linear perspective* & sure, it have a *4 vanishing points*, it is a system uses *curving perspective lines* instead of straight lines, & converging ones to approximate the image on the retina of the eye, which is itself spherical, more accurately than the traditional linear perspective, which uses straight lines and gets very strangely harder at the edges..

- Look at the visual examples in the next page
5 - Five-points perspective :

• What is 5 Points Perspective ?

• **Five points perspective** .. ( Globular or Infinite point perspective – المنظور المكور أو اللانهائي)

• It called also : ( fisheye perspective ) it is another type of **linear perspective** & In five-point (fisheye) perspective : Four vanishing points are placed around in a circle, they are named N, W, S, E, plus one vanishing point in the center of the circle...

• Look at the visual examples in the next page
Convert one point to >Five-points perspective

5 points perspective
In Cinema & Movies , (special in Action & Horror Movie) we can notice that they used a special strong methods of perspective angels , from a very deep angels in cadre .. May be very very low , or very very high , to add a special attraction for the Scene Action ... This modern methods for perspective angels Represented in :

1- The angle too high, above the level of normal matter of the scene, which is known as : (bird's eye perspective) ...

2- Or very low the angle, below the level considered normal for the scene, which is known as : (Ant's eye perspective) ... Look at the visual examples in the next page
Bird's eye perspective View
Ant's eye perspective View