

TERM	DEFINITION
<p>1-D Perspective << NEW Term >> 1-D Object / 1-D Image 2-D / 3-D Object Space 2-D / 3-D Image Space</p>	<p>Perspective image of a point (rare term: singular projection of a 1-D point) One-dimensional (1-D) perspective representation of a point (possibly aberration-free projection), being a 1-D perspective view/image/measurement/calculation, or 1-D plan/elevation projection, etc., of one-dimensional (1-D) object point, present in a 2-D or 3-D object space, and represented in a 2-D or 3-D image space. See: 1-D, 2-D, 3-D Perspective.</p>
<p>2-D Perspective << NEW Term >> 2-D Object 1-D / 2-D Image 2-D / 3-D Object Space 2-D / 3-D Image Space</p>	<p>Perspective image of a 2-D form (rare term: e.g., 2-D line projected as 1-D point or 2-D line) One or two-dimensional (1-D/2-D) perspective representation of a 2-D form (line or planar shape), being a 1-D/2-D perspective view/image/measurement/calculation, or 1-D/2-D plan/elevation projection, etc., of a two-dimensional (2-D) object form, present in a 2-D or 3-D object space, and represented in a 2-D or 3-D image space. See: 1-D, 2-D, 3-D Perspective.</p>
<p>2.5-D Perspective (A): Computer Games: Sky-box or Sky-dome 3-D << NEW / Refined Term >> Fixed 3-D Video Games</p>	<p>The term 2.5-D (two-and-a-half-dimensional) perspective refers to object representations or image movement in a video game environment restricted to a two-dimensional (2-D) plane with little or no access to a 3-D space that otherwise <i>appears</i> to be three-dimensional. One example is that early 2-D and 2.5-D computer games were often viewed from a plan or side-elevation view, with apparently dimensional, sprite-like characters. A common computer game version of the 2.5-D technique is a skybox, in which the spatial environment is enclosed in a cuboid. The sky, distant mountains, and other distant objects are projected onto the cube's faces (using cube mapping), thus creating the illusion of a distant three-dimensional environment. A skydome is similar, but uses a sphere or a hemisphere instead of a cube. Skyboxes and Skydomes are examples of fixed 3-D, which refers to a 3-D representation of the game world where foreground objects are rendered in real-time against a (relatively) static background.</p>
<p>2.5-D Perspective (B): Techniques: 3/4 Perspective, Pseudo-3-D << NEW Term >></p>	<p>So-called 2.5-D, 3/4 perspective, and pseudo-3-D describe graphical projections and techniques that try to give an impression of spatial depth, typically using parallel projection. Examples of other pseudo-3-D techniques include billboarding (textured objects that face the camera), parallax scrolling, and scaling (approximation of perspective recession). See: billboarding, parallax scrolling/scaling, pseudo-3-D perspective.</p>
<p>3-D (Artificial Representation) [1, 2, 3, 4, 5] << NEW Term >> Representation or Simulation of the Third Spatial Dimension or Depth 3-D Space or tri-dimensional space is a mathematical space, in which 3 values (coordinates) are required to determine the position of a point Monocular vision Binocular vision Uni-angular Multi-Angular Unlimited Angular Omni-Angular Optical Perspective Technical Perspective Artificial Perspective Instrument Perspective Graphical Perspective Visual Perspective (2)</p>	<p>In artificial perspective (imaging class), there are at least five kinds of 3-D representation:</p> <ol style="list-style-type: none"> 1. Uni-angular, monocular representation of a spatial scene/object A 1-D/2-D/3-D image/view/measurement/calculation of a spatial scene/object captured/depicted from a single viewpoint or viewing angle. A 2-D linear perspective image of a spatial scene/object projected onto a 2-D surface or picture plane is one example, captured from a fixed viewing angle. 2. Uni-angular, binocular representation of spatial scene/object A 1-D/2-D/3-D image/view/measurement/calculation of a spatial scene/object captured from a fixed central viewing angle, using a binocular method (twin apertures looking at very slightly different viewing angles). Viewing a stereoscopic image of a spatial scene/object is one example, employing monocular perspective depth cues, and certain binocular depth-cues. 3. Multi-angular, monocular, or binocular representation of a spatial scene/object A 1-D/2-D/3-D image/view/measurement/calculation of a spatial scene/object captured from multiple viewing angles, using either a monocular or binocular method. Viewing a hologram image is an example of multi-angular binocular 3-D, employing depth cues such as monocular perspective, focussing plus (partial) natural scaling and variable resolution effects, binocular vergence and parallax, plus 3-D shape changes due to (a narrow range of) multiple viewing angles, etc. 4. Unlimited-angle representation of a spatial scene (monocular or binocular, includes mirrors) A 1-D/2-D/3-D image/view/measurement/calculation/model of a spatial scene/object captured/modelled from (ostensibly) every viewing angle, using either a monocular or binocular method. Viewing/exploring a digital model (CAD computer modelling), or a Virtual Reality world, is an example of either unlimited viewing-angle monocular or unlimited viewing-angle binocular 3-D. With binocular 3-D, employed can be depth-cues such as monocular perspective (looking out/around plus looking in/at), possibly focussing, and (fully) natural scaling, variable resolution effects (zooming perspective), binocular vergence and parallax, plus 3-D shape changes due to multiple viewing angles, etc. 5. Omnidirectional representation of 2-D scene/object (monocular) or 3-D scene/object (binocular) For example, a type of 3-D perspective that enables a flat 2-D image to project the same aspect or geometry from omnidirectional viewpoints. See Andotrope, Zoetrope, and 3-D/2-D Perspective. The above list is by no means exhaustive. Any of the monocular/binocular depth-cues are available to aid in the representation of 3-D, depending upon the limitations of the method/media employed.

TERM	DEFINITION
<p>3-D (Natural Space - Viewing / Imaging / Representing) << NEW Theory >></p> <p>Third Spatial Dimension or Depth Physical Space 3-D Space or tri-dimensional space is a mathematical space, in which 3 values (coordinates) are required to determine the position of a point Monocular vision Optical Perspective Technical Perspective Natural Perspective Visual Perspective (1) Visual Perspective (2) Mathematical Perspective Graphical Perspective Instrument Perspective Simulated Perspective New Media Perspective Perspective Category Category Overloading Composite Perspective Perspective = Method + Outcome Perspective Form View, Match, Represent, Illusion, Immersion Linear Perspective Target Reality: Natural (physical) / Artificial / Illusive / Imagined (Artistic) Image Reality: Visual or Optical / Graphical / Mathematical / Instrument / Simulated / New Media Perspective of Form Gradient of Colour Gradient of Acuity Gradient of Chiaroscuro</p>	<p>Perspective and 3-D <Imaging perspective ></p> <p>Perspective <IMAGING CLASS> is the formation of an image or view—that is, a representational pattern—of a state of affairs present in a target spatial reality (e.g., natural, artificial, illusive, imagined three-dimensional space, etc). Perspective is a complex topic, one beset by problems in establishing accurate, precise, consistent, and widely accepted concept definitions. Let us explore related issues.</p> <p>Visual perspective (1st type) <IMAGING CLASS> is when a visual image is used to view, match, represent, create an illusion of, or an immersion into, the visual appearance of a spatial object/scene. A perspective category refers to a specific class of perspective system (or perspectival method); with a corresponding set of optical, mathematical, graphical, instrument/illusive, or new-media processes. We have six primary categories: natural and visual perspective (2nd type), plus mathematical, graphical, instrument, simulated and new media perspectives. Oftentimes, more than one category is involved simultaneously to produce a perspective view/image; this is called composite perspective (1), as when we use a camera (instrument perspective) to photograph a natural scene (natural / environmental perspective), then use visual perspective (2nd type or eye / retinal class) to view the resultant photograph.</p> <p>Sometimes the same sub-class can appear under multiple top-level categories; named category overloading or category chaining, for example, when we have a linear perspective drawing, which seems to be equally a graphical and a mathematical process. Sometimes, a perspective type appears to be both a perspective category (method) and a perspective form (outcome) simultaneously. But why is this so? The answer is that (for example) linear perspective is a name that applies to both a perspective category (a method/process) and a perspective geometric image form (image shape or appearance geometry) simultaneously.</p> <p>We have 4 classes of perspective form (outcomes corresponding to perspective phenomena):</p> <ol style="list-style-type: none"> 1) Perspective of Form (geometric image aspects), linear perspective is one example. 2) Gradient of Colour perspective (aerial perspective - perspective of). 3) Gradient of Acuity perspective (image clarity/sharpness). 4) Gradient of Chiaroscuro perspective (image contrasts between light and dark). <p>The graphical type of linear perspective (perspective of lines/outlines) provides a linear structure for the depiction on a surface of the apparent size, shape, and relative position of the objects constituting a spatial scene in 3-D; that is, for the representation of physical space. This is a type of perspective image/view that most people are familiar with and learned about, or at least learned to recognise and name in school (ref. checkerboard/geometrical perspective, horizon line, central vanishing point, etc).</p> <p>But graphical is only one of 3 types of linear perspective (perspective of lines/outlines):</p> <ul style="list-style-type: none"> • Graphical/Artificial Linear Perspective: when we construct a drawing of a spatial object/scene according to 1-2-3 point perspective. • Visual/Natural/Optical Linear Perspective: when we look at or capture an image of a spatial object/scene with an optical instrument, or a particular type of object space, such as a metric grid. • Physical Constructed Linear Perspective: use of simulated, forced perspective to change the physical environment according to the appearance rules of 1-2-3 point perspective. <p>Perspective is a complex topic because it involves reconciling the 3-D space of the physical world (object space), with the 2-D space of visual (2), graphical or photographic perspective (perspective space). Often, despite a strong desire to achieve equality/alignment, this reconciliation is difficult (if not impossible) to achieve with perfect correlation, because one is dealing with dimensions that must map without any physically based 1:1 correspondence or identical mapping. Patently, information may be lost in this process due to the inherent optical limitations of a single point-of-view, plus aspect-of-form shape changes and scale/size relations, etc., resulting in reduced (or concealed/confused) visual information structures/details. Overcoming aspects of this geometric correspondence—or equivalence—problem is a key 'goal' of visual/optical/technical perspective.</p> <p>A perspective category, such as linear perspective (graphical type/form), embodies standard mathematical relationships for image transformation factors. But in a real-world situation, such as using a camera, the apparent distance, size, and shape features may differ significantly from expected results. Such differences increase towards the edges of an eye/lens image, where wide-field perspective distortions come into play, leading to curvilinear/spherical perspective effects, etc. Patently, for cartographic, astronomical, engineering and technical drawing, etc., it is desirable to employ accurate image analysis techniques, which explains the use of parallel perspective and/or other counter-distortion methods. In conclusion, both natural/visual and artificial perspective categories produce a structured space that emanates partly from spatial reality, partly from the perspective method, and partly from the visual scale(s)/resolution(s) involved, and this process occurs by the application of perspective principles/methods/theory (whether realised or not).</p>

TERM	DEFINITION
<p>3-D Display - Design (1, 2, 3, 4, 5, 6): A, B, C, D, E, F, G << NEW Term >></p> <p>Surface Display Light Field Display Lenticular Display Holographic Display</p> <p>Swept-Plane Display BOOM AR system</p> <p>Near-Eye Display Distant Display Flat Display Volume Display Hologram Display</p> <p>Reflection Hologram</p> <p>Fan-Hologram</p> <p>Flat Screen Stereoscopic Volumetric Other</p> <p>Optical Image Hologram Image Reflection Image Retinal Image</p> <p>Monocular vision Binocular vision</p> <p>Instrument Perspective</p> <p>Visual, combined, mixed, blended perspective</p> <p>Technical Perspective</p> <p>Visual (2) / Optical Perspective</p>	<p>A surface 3-D display device, or other type of optical/volume 3-D display, may be capable of conveying depth to the viewer by application of one or more depth cues, often using film or digital media-based images.</p> <p>There are at least five basic kinds of 3-D surface displays used for binocular vision:</p> <ol style="list-style-type: none"> 1. Stereoscopic surface display (uni-angular, multi-angular, VR/AR [plus BOOM]) Stereoscopic displays produce a 3-D effect using stereopsis, but can cause eye strain and visual fatigue. Stereoscopic 3-D displays are commonly used in VR / AR. Also a BOOM AR overlays a digital universe onto the physical universe. Holograms are intrinsically stereoscopic (no eye-strain). 2. Light field 3-D surface display (mostly uni-angular type) A light field display produces a realistic 3-D effect by combining uni-angular stereopsis and accurate focussing depth cues for the displayed content. 3. Lenticular auto-stereoscopic 3-D surface display (uni-angular parallel type) A lenticular 3-D display produces a parallax-type 3-D stereoscopic image/view. 4. Holographic 3-D surface display (multi-angular type) A holographic display produces a more realistic 3-D effect using interactive holograms (holographic images of motion type), by combining multi-angular stereopsis and accurate focussing depth cues, moving station point, variable-resolution effects (zooming), binocular vergence and parallax, plus 3-D shape changes due to multiple viewing angles for the displayed content. At the time of writing, no widely available holographic displays have been invented or become available for widespread use (excluding mirror images - all types). 5. Swept Plane 3-D Display: a structure from motion technique creating the optical illusion of a volume of light, due to the persistence of vision property of human visual perception. The principle is to have a 2-D lighted surface sweep in a circle across space, creating a volume. The image on the 2-D surface changes as the surface rotates. The lighted surface needs to be semi-translucent. A type of volumetric display with a 360 degree viewing angle (potentially). 6. Virtual 3-D Display (projected field-of-view): generation of a 3-D display using a VR headset <p>Distance from Observer's Eye We can also classify surface displays in terms of distance from the observer's eye:</p> <p>Distance of 3-D display: A: Near-eye, B: Distant, as in TV or theatre screen 3-D displays can be: near-eye displays, as in VR headsets, or they can be further away from the eyes like a 3-D-enabled mobile device or 3-D TV, or a 3-D movie theatre.</p> <p>Display Form We can also classify the displays in terms of display/image form:</p> <p>Physical screen 3-D display: C: Flat, D: Volumetric (curved / spherical) Notably, the term "3-D display" can also refer to a volumetric display, which may generate content that can be viewed from multiple angles (volume screens, etc).</p> <p>Real-space image 3-D display: E: Hologram, F: Reflection hologram, G: Other</p> <p>Still, other kinds of displays are possible, for example, projection onto retina, and andotrope, etc. See: 3-D, 3-D perspective (1, 2, 3, 4), volume display, andotrope, fan-hologram, BOOM, visual perspective.</p>
<p>3-D Display - Views (1, 2, 3, 4) << NEW Term >></p> <p>Uni-Angular Multi-Angular Unlimited-Angle Omni-Angular</p> <p>Monocular vision Binocular vision</p> <p>Optical Perspective Technical Perspective</p> <p>Visual Perspective (2)</p>	<p>For an artificial perspective image display system, there are three kinds of 3-D view:</p> <ol style="list-style-type: none"> 1. Uni-angular view of uni-angular image of spatial scene/object An ordinary 2-D perspective image displayed on a surface display or computer monitor. 2. Multi-angular view of uni-angular image of spatial scene/object (see: panoramic perspective (2A)) The term "3-D" is used for a volumetric display that shows uni-angular images of a spatial scene taken from multiple viewing angles (camera changes direction of observation), whereupon the images taken from different angles have been 'stitched together', and are notionally viewed in a 3-D space, but without experiencing true observer-based angular perspective changes. Only (uni-angular) perspective depth cues are available (from observer perspective). Example: 2-D images viewed/present in a 3-D space. 3. Multi-angular view of multi-angular image of spatial scene/object (see: panoramic perspective (2B)) The term "3-D" is also used for a volumetric display that generates content viewed from multiple angles, i.e. multi-angular images captured/generated by/for viewing from multiple viewing angles, whereupon the onlooker (may) experience multi-angular perspective depth cues (on directional screen canvases). Example: spatial or 3-D images/views that are in a 3-D space and presented/viewed from multiple or changing viewpoints (or viewing angles). See: Volume screen / display (1,3), virtual production. 4. Omnidirectional representation of 2-D scene/object (monocular) A type of 3-D perspective that enables a flat 2-D image to project the same aspect or geometry from omnidirectional viewpoints. See Andotrope, Zoetrope, and 3-D/2-D Perspective. See: 3-D display design, hologram, computer display/monitor, andotrope, LED volume screen.

TERM	DEFINITION
<p>3-D Film</p> <p>Monocular vision Binocular vision Technical Perspective Instrument Perspective</p>	<p>Three-dimensional or 3-D films are motion pictures designed to create the illusion of three-dimensional (3-D) spatial solidity, usually with the help of special glasses worn by viewers. They have existed in some form since 1915 but have been largely relegated to a niche in the motion picture industry because of the costly hardware and processes required to produce and display 3-D films, as well as the lack of a standardised format for all purposes/applications. However, 3-D films were prominently featured in American cinema in the 1950s and later experienced a worldwide resurgence in the 1980s and 1990s, driven by IMAX theatres and Disney-themed venues. 3-D films became increasingly successful throughout the 2000s, peaking with the release of Avatar in 3-D in December 2009, after which 3-D films again decreased in popularity.</p>
<p>3-D Modelling (1, 2)</p> <p>Solid Modelling Single-Scale Multi-View Multi-Scale</p>	<p>1. Three-dimensional physical model Three-dimensional physical model of a spatial object/scene (normally a single-scale image/view, and may be true or actual life-sized scale, or be at a reduced/magnified scale).</p> <p>2. Three-dimensional computer model Three-dimensional modelling is the computer graphic process of developing a mathematical coordinate-based representation of the visible surface(s) of a spatial object in three dimensions using specialised software, and by manipulating edges, vertices, and polygons in a 3-D image/model space.</p> <p>See: computer / digital perspective, CGI, CAD, geometry, ray-tracing, Hoberman sphere, wire-frame perspective, New Media perspective, 3-D display design, 3-D display views.</p>
<p>3-D Perspective << NEW Term >> 1-D / 2-D / 3-D Object 1-D / 2-D / 3-D Image 3-D Object Space 2-D / 3-D Image Space</p>	<p>Perspective image of a 1-D / 2-D / 3-D form (ordinary definition of perspective) One, two, or three-dimensional (1-D/2-D/3-D) perspective representation of 1-D/2-D/3-D form, being a 1-D/2-D/3-D view/image/measurement/calculation, or 1-D/2-D/3-D plan/elevation projection, etc., of 1-D/2-D/3-D spatial form, present in a 3-D object space, and represented in a 2-D or 3-D image space. See: 1-D, 2-D, 3-D Perspective.</p>
<p>3-D Perspective (1): Depth Illusion Classes: A, B, C, D</p> <p>Illusion (general) Illusion of Depth Illusion of 3-D Immersion in 3-D Graphical Perspective Instrument Perspective</p>	<p>3-D Perspective Illusion [1]: Illusion of depth in a spatial object/scene Depth illusion of spatial forms present in a natural, artificial, or synthetic spatial reality. The four classes of perspective 'depth' illusion are:</p> <ul style="list-style-type: none"> A. Flat/plane picture plane: Spatial illusion by perspective representation on a 2-D surface (monocular depth cues). Includes swept-plane displays / fan holograms. B. 3-D modelling perspective: Spatial illusion by physical or computer modelling (monocular/binocular depth cues - may employ multiple or changing eye, station, or viewpoint). C. Stereoscopic views using mirror images, or virtual reality stereoscopic views/images: Spatial illusion by stereoscopic views of mirror or virtual reality (binocular depth cues). D. Stereoscopic views of false reality: construction or representation of an artificial 3-D stereoscopic image/view of a spatial reality, formed by an adjusted, illusive, or false reality perspective which is also called 'false' or 'trick' perspective (views of natural/built world)—being visual illusion by the construction of a false spatial reality, or by the representation of a false spatial reality (distorted/transposed scene/physical geometry). <p>See perspective illusion, forced and accelerated perspective, and simulated perspective.</p>
<p>3-D Perspective (2): Illusion Types: A, B, C, D << NEW Term >> Illusion (general) Illusion of Depth Illusion of 3-D Immersion in 3-D Graphical Perspective Instrument Perspective Visual Perspective (2)</p>	<p>Perspective illusion [2]: False visual impression of scene geometry or optical facets Perspective techniques are sometimes used to create optical illusions. Typically, a perspective illusion makes false impressions of size, depth, position, place (immersion), or transparency for objects/people. One example is when dimensionality is adjusted within a scene, making an object appear farther away, closer, larger, or smaller than it is.</p> <p>The four types of optical perspective illusions are:</p> <ul style="list-style-type: none"> A. Visual Perspective Illusion: illusion by perceptually adjusted appearance (false direct view of physical reality); B. Graphical Perspective Illusion (includes perspective drawings/paintings): illusion by graphically constructed appearance (false apparent view of spatial scene); C. Instrument Perspective Illusion: illusion by secondary visual images (cinema, holograms, etc), and/or projected appearance (false formed view of 3-D scene); D. Simulated (Forced) and/or Synthetic Perspective Illusion: illusion by physical construction of a false physical reality (apparent), or by the representation of a false physical reality (distorted/transposed scene geometry with apparent illusive effects). <p>See perspective illusion, forced /accelerated perspective, simulated / synthetic perspective.</p>

TERM	DEFINITION
<p>3-D Perspective (3): Representation (A, B, C) << NEW Term >> 2-D Representation Monocular Binocular view (fixed station point and viewing angle) Binocular view Holograms (changing station point, and multi-directional viewing angle) Graphical / Instrument Perspective Virtual Reality World (unlimited viewpoints / angles)</p>	<p>3-D Perspective: 3. Perspective as a representation of a spatial reality We can define perspective as the formation of an image/view—or a representational pattern—of a state of affairs in a spatial reality, which can be produced by a range of natural, artificial, or synthetic processes. Ergo, we can consider perspective to be a representation of a spatial form present in a natural, artificial, or synthetic spatial reality. The three classes of perspective representation are: A. Uni-angular image: monocular or fixed-angle binocular Fixed viewing-angle monocular representation, or notionally fixed central viewing-angle binocular representation; being an (apparent or real) 3-D view/image/measurement/calculation (optical/geometric projection) of a spatial form. Includes all types of perspective that exhibit spatial recession on 2-D surface (e.g., linear perspective), and also fixed central viewing-angle stereoscopy and auto-stereoscopy. Normally, this class of perspective representation has a fixed real, or fixed simulated, viewing position/scale. B. Multi-angular image: holograms (limited multi-angular binocular images) Multiple viewing-angle stereoscopic image, or a limited multi-angular binocular image, being a view/image/measurement/calculation/representation (holographic projection), of a two or three-dimensional spatial form. Normally, this class of perspective representation has a limited range of viewing position(s)/scale(s). C. Unlimited-angle image: virtual reality (unlimited binocular), or mirror images Unlimited viewing-angle(s), plus roaming station point(s), image, of stereoscopic type, being a binocular three-dimensional perspective view/image/measurement/calculation/representation (holographic projection), of two or three-dimensional spatial form. This class of perspective representation has unlimited viewing positions and angles/scales, and is often a New Media system (or mirror system).</p>
<p>3-D Perspective (4): Spherical Panorama << NEW Term >> Total, Circular, Panoramic</p>	<p>3-D Perspective: 4. Spherical panorama: monocular vision Imaging/projecting (mixed perspective) type of technical perspective that captures/represents/projects a full 360-degree spherical panorama for a surrounding visual scene. See: Circle of revolution perspective, circle of vision perspective, cylinder of revolution perspective, cylinder of vision perspective, sphere of revolution perspective, sphere of vision perspective, sphere of vision, looking-out/around / looking-in/at at perspective, circular / spherical / curvilinear perspective, Dick Termes and termespheres.</p>
<p>3-D Perspective: Stereoscopy (5 - A) Binocular Vision Visual Perspective (2)</p>	<p>3-D Perspective: 5 A. Stereoscopy: binocular vision 3-D perspective (visual type) is any type of stereoscopic perspective view that gives a human being an impression of depth by using his/her binocular vision or binocular perceptive system. Humans have binocular vision, which means there is an overlap of a portion of the visual world perceived by each eye (each eye sees the same object from a slightly different viewing angle). This binocularity of human vision, or the difference in the shapes of the separate images from each eye, can be used by the brain to provide the impression of 3-D or dimensional relief for nearby objects. Ergo, the physical world appears as a natural 3-D perspective view due (in part) to the binocular capability of human vision. Note that a live mirror image is inherently a stereoscopic image. Note that monocular depth cues (including monocular perspective) also play a (major) part in the human perception of spatial extension or depth. See: binocular vision, mirror.</p>
<p>3-D Perspective: Stereoscopy - auto-stereoscopy (5 - B)</p>	<p>3-D Perspective: 5 C. Stereoscopy: auto-stereoscopy Form of artificial 3-D stereoscopic view made without using special headgear, glasses, or something that affects vision, for example, autostereograms, or lenticular, integral, parallax displays, etc. Volumetric and some LED displays are also (in a sense) autostereoscopic, as they produce a different image for each eye, but only in terms of the apparent screen viewing angle.</p>
<p>3-D Perspective: Stereoscopy - binocular optics (5 - C)</p>	<p>3-D Perspective: 5 B. Stereoscopy: binocular optics Another way to capture, produce, or view an artificial 3-D stereoscopic image/view is by using instrumentation. Holograms, stereograms, 3d cinema, Virtual Reality headsets, etc., are all systems that generate binocular images/views that portray binocular depth cues to give a realistic impression of depth.</p>
<p>3-D Printer CAD Modelling in 3-D</p>	<p>A 3-D printer is an instrument for 3-D printing of objects, also named additive manufacturing, and is used for the construction of a physical three-dimensional object from a CAD model or a digital 3-D model. It can be achieved by a variety of processes in which material is deposited, joined, or solidified under computer control, with the material being added together (such as plastics, liquids, or powder grains being fused), typically layer by layer.</p>
<p>3-D Scanner</p>	<p>Refers to the production of a perspective image/view of a spatial scene by use of a projecting beam of EM radiation upon a scene, whereupon the reflected beams is analysed for changes that enable scene spatial or 3-D geometry to be calculated or inferred. See: Laser/ Radar Scanning Perspective, space, depth, distance, light, 3-D, 3-D perspective.</p>

TERM	DEFINITION
<p>3-D Space - Concept of</p> <p>Space Natural Space Represented Space</p> <p>Physical Space Optical Space Visual Space</p> <p>Space-convergent Space-divergent Space-parallel Space-curved Space-tessellation of</p> <p>Space (artificial perspective) Space (Euclidean) Space (imaginary) Space (ludic) Space (mathematical) Space (metaphysical) Space Box / Diagram 1-D, 2-D, 2.5-D, 3-D Perspective Depth Cues Perspective Phenomena</p>	<p>Space is a three-dimensional continuum containing positions and directions. In classical physics, physical space is often conceived as a three-dimensional space. Modern physicists usually consider it, with time, to be part of a boundless four-dimensional continuum known as <i>spacetime</i>. The concept is fundamental to understanding the physical universe. However, disagreement continues over whether space is itself an entity, a relationship between entities, or part of a conceptual framework. In geometry, a three-dimensional space is a mathematical space in which three values (termed <i>coordinates</i>) are required to determine the position of a point. Most commonly, it means a three-dimensional Euclidean space, that is, a space that obeys the rules of Euclidean geometry. The term may refer to a subset of space, a <i>three-dimensional region</i> (or 3-D domain), or a <i>solid figure</i>. In summary, 3-D space (three-dimensional space) is the mathematical and physical model of the world we live in, where three values are required to pinpoint any location. These dimensions are typically described as length, width, and height (or depth).</p> <p>Core concepts</p> <ul style="list-style-type: none"> • Coordinate Systems: In mathematics, the most common way to map 3-D space is the Cartesian coordinate system, using three axes (x, y, and z) that meet at a central point called the origin. • Physical Reality: Everything we touch and move exists in 3-D. While a flat drawing has only length and width (2-D), a physical object like a cube or a ball adds the third dimension of depth. • The Fourth Dimension: In physics, especially under Einstein's Theory of Relativity, time is often treated as a fourth dimension (t), merging with space to form a 4-D "spacetime continuum". <p>Space and Perspective <IMAGING CLASS>: Object or Target Space, and Image or Perspective Space.</p> <p>Perspective encompasses natural perspective—how we see things, and artificial perspective—how we represent this in various media. Perspective principles and methods are essential for understanding space, particularly the third dimension. Accordingly, we have three kinds of space: A) physical 3-D space (object space); B) natural optical space [2-D/3-D image space] or natural visual image space (2nd type) [monocular/binocular], and C) artificial/instrument image space [2-D/3-D] or graphical/represented image space [2-D/3-D]. N.B. Image space = perspective space.</p> <p>See: space, space-convergent, space-curved, space-tessellation of, space (artificial perspective), space (Euclidean), space (imaginary), space (ludic), space (mathematical), space (metaphysical), space (optical), space (physical), space (visual [A,B]), space box, space curves, space diagram, space point, spatial ambiguity.</p>
<p>3-D Space - General Types Relating to Perspective (abbreviated list)</p> <p>< NEW / REFINED Term ></p> <p>Types and Concepts of Space that are relevant to the field of Visual/Optical/ Technical Perspective</p>	<p>Accelerated Space, Anamorphic Space, Blended Scene Space, Blended View Space, Category Chained Space, Category Overloaded Space, Cleft Space, Combined Space, Complex Space, Composite Space, Compositional Space, Convergent Space, Divergent Space, Double Space, Fragmented Space, Manifold Space, Mixed Space, Multi-Plane Space, Multi-Scene Space, Multi-View Space, Parallel Space, Simple Space, Split Space, Synthetic Space, Universal / Particular Space, 3-D Spaces (Visual Types), 1-2-3-4-5-6 Point Space(s), 3-D Modelled Space, 360-Degree Space, Aberrated Space, Abstracted Space, Accelerated Space, Adjusted Space, Algorithmic Space, Animated Space, Astronomical Space: General / Tilted, Astronomical Space: Gnomonic, Astronomical Space: Orthographic, Astronomical Space: Stereographic, Augmented Reality Space, Axonometric Space, Bifocal Space, Binocular Space, Bitmap Space, Black-Mirror Space, Box Space, Camera Space, Captured Space (Image), Celestial Space, CGI Space, Chequerboard / Chessboard Space, Cinematic Space, Circle of Revolution Space, Circle of Vision Space, Correct / True Space, Cube Space, Cube-Grid Space, Cubist Space, Cycloplan Eye Space, Decelerated Space, Descriptive Geometry Space, Digital Space, Double Axonometric Space, Double Exposure Perspective, Double Horizon Perspective, Exterior Space, Fish-Eye Lens Space, Flat Sphere Space, Flattened / Compressed Space, Forced Space, Foreshortened Space (1,2), Four-Dimensional Perspective, Fractal Space, Front-Projection Space, Geographic Space, Geometrical Space, Gestalt Space, Glass Ball Space, Glass Camera Shot Space, Globe Space, Gott Space (map projection), Holographic Space, Homogenous Space, Hyperspace, Illuminated Space, Illusive Space, Image Space, Imaginary Space, Invisible Space, Interior Space, Intermediary Space, Invisible Space, Lenticular Auto-Stereoscopic 3-D Space, Mapping Perspective, Matte Camera Shot Space, Measured Space, Microscopic Space, Mirror Ball Space, Mirror Camera Shot Space, Mirror Space, Mixed Reality Space, Modular Space, Monkey Bar Space, Monocular Space, Montage Space, Multi-Aspect Space, Multi-Layer Space, Natural Space, Negative Space, Opaque Space, Optical Printing Space, Orthographic Space, Overlaid Space, Overlapping Space, Panoramic Space, Parallax Display Space, Parallax Space, Paraline Space, Patchwork Space, Perspective Space, Photographic Space, Physical Space, Picture Space, Projected Space, Projective Geometry Space (Desargues), Psychological Space, Random Dot Picture Space, Rear-Projection Space, Reverse Perspective Space, Shadow Space, Substituted Space, Swept Plane 3-D Space, System Space of Renaissance Perspective, Tactile / Haptic Space, Target / Object Space, Telescopic Space, Tilted Camera Shot Space, Transparent Space, Vector Space, Virtual Reality Headset Space, Virtual Reality Space, Virtual Space, Visual / Optical Space (live view), Volume Display Space (Concave), Volume Display Space (Convex), Wire Frame Space, Zero-Point Space, Zoomable Space (Digital), Zoomable Space (Optical).</p>

TERM	DEFINITION
<p>3-D Space - Geometry of</p> <p>Object / Target Space Image Space</p>	<p>Geometry is a branch of mathematics concerned with properties of space such as the distance, shape, size, and relative position of figures.</p> <p>Basic kinds of coordinate space / geometry (sample only)</p> <ul style="list-style-type: none"> • Body-Coordinate System Space [3-D]: object and/or image space. • Cartesian Space (Cartesian coordinates) [3-D]: object and/or image space. • Flat Space [2-D/3-D], Curved Space [2-D/3-D], Riemannian Space [3-D]: object or image space. • Euclidean Space [2-D/3-D], Non-Euclidean Space [2-D/3-D]: object and/or image space. <p>Kinds of perspective space / geometry <IMAGING CLASS> (abbreviated list)</p> <ul style="list-style-type: none"> • Linear Perspective space [2-D]. Physical or scene based Linear Perspective space [3-D]. • Curvilinear space [2-D/3-D], Cylindrical space [2-D/3-D], and Spherical space [2-D/3-D]. • Visual space (2nd type or retinal) [monocular/binocular]. • Represented or graphical space: 1-D Space, 2-D Space, 2.5-D Space, 3-D Space. • New Media / Virtual Reality / CGI Space: interactive 3-D model or 3-D optical model of spatial reality. • Sphere/Circle/Cylinder of Vision Perspective [2-D/3-D]: spherical/circular space, with eye as origin. • Sphere/Circle/Cylinder of Revolution Perspective [2-D/3-D]: spherical/circular space, with object as origin.
<p>3-D Space - Invisible (1, 2)</p> <p>Intrinsic Property of Space Invisible Region of Space Invisible Perspective</p>	<p>1: Space is Invisible (intrinsic property of space) Space is invisible, and we humans rely on recognising standard shapes within spatial views/images and on orienting ourselves in relation to, and mapping/understanding, dimensional scenes/objects.</p> <p>2: An "Invisible" region of Space (objects present but illusion of emptiness): Invisible Perspective Perspective methods/systems can produce an apparent region of physical space that is invisible, or that can contain objects hidden from the viewer of a spatial scene. Note that the space is not blocked in any detectable sense, but rather the view appears open, empty, and unobscured.</p>
<p>3-D Space - Perspective Categories of</p> <p><< NEW Term >></p> <ul style="list-style-type: none"> • Physical Space • Optical / Visual Space (2) • Artificial / Instrument / Represented Space <p>Natural Space Mathematical Space Graphical Space Instrument Space Simulated Space New Media Space</p>	<p>In terms of Perspective Category Theory, category refers to the components of a perspective system <IMAGING CLASS>, or a conjoined set of Optical/Mathematical/Graphical/Instrument/Simulated/New-Media processes involved in producing a perspective image/view. Each perspective system category deals with a specific kind of 2-D/3-D image space, or with transforming an object/target space into a perspective space. Sometimes the same perspective subclass appears under multiple top-level categories; this is called category overloading or category chaining, and it involves multiple kinds of perspective space. Also, when more than one category is involved in producing a perspective view/image, as in composite perspective (1), multiple kinds of perspective space are involved.</p> <p>Kinds of perspective space (natural and artificial classes) - [all may be 2-D/3-D (apart visual)]</p> <ul style="list-style-type: none"> • Digital / New Media Space ----- New Media Perspective • Graphical Space ----- Graphical Perspective • Instrument Space ----- Instrument Perspective • Mathematical Space ----- Mathematical Perspective • Optical Space ----- Optical Perspective • Physical Space ----- Natural Perspective • Simulated / Illusive Space ----- Simulated Perspective • Visual Space ----- Visual Perspective (2nd type) - [monocular/binocular]
<p>3-D Space - Perspective Invisibility Methods / Systems</p> <p><< NEW Term >></p> <p>Invisible Space Invisible Perspective Perspective Illusion Invisible Objects</p>	<p>Perspective methods/systems can be used to produce an apparent region of physical space that is invisible, or can contain objects that are hidden from the viewer of a spatial scene. Note that the "invisible perspective" view or invisible 3-D space is not blocked in any detectable sense, but rather the view appears open and unobscured. There are many invisibility techniques, but the basic methods are:</p> <p>A) Optically produced invisibility (live image viewing); and B) Filmic or digital/New-Media produced invisibly (live or recorded image viewing); and C) Combined optical and digital/New Media produced invisibility (live or recorded image viewing).</p> <p>We can list some optically produced invisibility methods:</p> <p>A) Angled mirrors can make objects appear 'invisible' by diverting light rays and creating a (secretly) split, fragmented or diverted view. B) Specially arranged mirrors/prisms can make objects appear 'invisible' by diverting light rays and creating a (secretly) split, fragmented or diverted view. C) Lenticular 'invisibility cloaks', can make objects appear 'invisible' by diverting light rays and creating a (secretly) split, fragmented or diverted view. D) Double/blended space illusion (physically adjusted environment): manipulation of false' vanishing points can result in a multi-scale space in which objects can potentially be hidden. E) Rotated/diverted view Illusion: in 1983, magician David Copperfield famously made the Statue of Liberty disappear in a massive televised illusion using a rotating platform to shift the audience's view while obscured by a curtain. Different apparent and true viewing directions.</p> <p>See: invisible space, invisible perspective, 3-D space - perspective Invisibility methods/systems, optical special effects, mirror perspective, concave/convex mirrors, mirror hologram, virtual mirror space, perspective illusion, Pepper's ghost illusion, projection mapping, metric grid (A), perspective framework.</p>

TERM	DEFINITION
<p>3-D Space - Transformed Perspective Space(s)</p> <p><IMAGING CLASS></p> <p>< NEW / REFINED Term ></p> <p>Accelerated Space</p> <p>Anamorphic Space</p> <p>Blended Scene / Image Space</p> <p>Category Chained Space</p> <p>Category</p> <p>Overloaded Space</p> <p>Cleft Space</p> <p>Combined Space (multi-view, multi-scene)</p> <p>Complex Space (A, B)</p> <p>Composite Space</p> <p>Compositional Space (A, B)</p> <p>Convergent Space</p> <p>Divergent Space</p> <p>Double Space</p> <p>Fragmented Space</p> <p>Invisible Space</p> <p>Manifold Space</p> <p>Mirror Space</p> <p>Mixed Space</p> <p>Multi-Plane Space</p> <p>Multi-Scene Space (A, B)</p> <p>Multi-View Space (Single Scene)</p> <p>Multi-View Space (Multiple Objects)</p> <p>Multi-View Space (Orthographic)</p> <p>Multi-View Space (New Media)</p> <p>Parallel Space</p> <p>Simple Space</p> <p>Simulated Space</p> <p>Synthetic Space</p> <p>Unified Space</p> <p>Virtual Mirror Space</p> <p>Virtual Space</p> <p>Volume Display Space</p>	<p>Several kinds of systematically transformed perspective spaces are identified to achieve illusive and optical special effects, and some of the more unusual ones are detailed below. Sometimes different names refer to the same type of special effect; due to the varied history of perspective terminology.</p> <p>Transformed perspective space(s) (natural / artificial) - [all may be 2-D/3-D (apart visual)]</p> <ul style="list-style-type: none"> • Accelerated / Forced Space - type of simulated and (possibly) synthetic perspective (apparent spatial structure) that (for example) employs forced perspective to increase the perspective recession, or increase the converging angle of lines directed towards vanishing points, increasing apparent depth. • Anamorphic Space - view/image with global geometry distortion. • Blended Scene Space - comprises two or more separate spatial geometries (indistinct). • Blended Image Space - multi-view image containing separate images/view (distinct/indistinct). • Category Chained Space - single category image involves multiple categories and spaces (normal case). • Category Overloaded Space - multiple categories produce multiple or blended kinds of space. • Cleft Space - split or fragmented space at two different distances or planes from the eye/camera. • Combined Space (multi-view) - image contains both real and represented views (distinct). • Combined Space (multi-scene) - synthetically unified scene - single scale-space (distinct/indistinct). • Combined Space (universal + particular) - universal scene and particular views. • Complex Space (A) - interaction of artificial and natural perspective. • Complex Space (B) - central rays falling between all object/image point(s) are not symmetrical. • Composite Space - more than one category is involved to produce a perspective view/image. • Compositional Space (A) - derived partly from art (graphics) and partly from nature (vision/ optics). • Compositional Space (B) - universal scene and particular views. • Convergent Space - diminution of size perspective (ref. linear perspective). • Distinct Space - refers to a blended/composite/double space in which the component spaces are visually distinct, one from another. • Divergent Space - Graphical space in which objects increase in apparent size at increasing distance. • Double Space - two separate perspective spaces are combined into an apparent direct or simulated real-space view that exhibits illusive properties (indistinct). • Fragmented / Split Space - Use of layered or multi-view approaches, for example, a cleft space for spatial manipulation, with actors at two different distances from the camera. • Invisible Space or Invisible Perspective: a visually hidden region of a spatial scene. • Manifold Space - A combined image consisting of both a reflection and a transmission. Such as when you see your own reflection in a shop window while simultaneously seeing the shop's interior, or when multiple reflected images form in an Infinity mirror setup. • Mirror Space (ordinary reflection) - when a plane mirror forms virtual images of a person/ scene. See: "virtual space" entry below. • Mirror Space (types): convex/concave mirror, hologram mirror, faux space mirror illusions (many types). • Mixed Space - A combination of imaging and projection perspective classes. • Multi-Plane Space - Any perspective method that enables in-focus imaging of transparent or semi-transparent planes of space to be captured in one or more images, or else represented. • Multi-Scene Space (A) - synthetically unified scene - single scale-space (indistinct). • Multi-Scene Space (B) - unified scene by image blending/combination, image overlay/ substitution, or another method - single or multiple scale-space (distinct or indistinct). • Multi-View Space (Single Scene) - changing viewpoint in real time (CAD/ digital games). • Multi-View Space (Multiple Objects) - when a single image contains multiple objects (multiple aspects). • Multi-View Space (Orthographic) - first or third-angle projection. • Multi-View Space (New Media) - linkage and interactive exploration of a 3-D digital model/world. • Non-Unified Space - non-unified (central) vanishing point gives a non-scientific space. • Parallel / Paraline Space - the graphical space of parallel projection or primary views (1st/3rd angle). • Simple Space - central rays falling between all object/image point(s) are symmetrical. • Simulated Space - designed illusive/immersive images/views of a spatial reality, by visual illusion or optical adjustment of physical reality. • Synthetic Space - any (systematic) or accidental combination of natural and artificial perspective. • Unified Space - unified (central) vanishing point gives a scientific space. • Virtual Mirror Space - AR-enabled screens with cameras that reflect users in real-time for virtual clothing try-ons and immersive experiences. • Virtual Space - Space" behind a mirror is the perceived location of reflected images, a 3-D illusion created by the brain interpreting reflected light as originating from behind the mirror. • Volume Display Space (convex screen) - static or camera relative generated background views. • Volume Display Space (concave screen) - static or camera relative generated background views.

TERM	DEFINITION
<p>3-D Visual Perception: Images are Perceived as In-front of our Eyes!</p>	<p>An astounding fact is that there is a psychic phenomenon corresponding with the stimulation of the retina by rays of light, whereby we see light, and thus images, as something existing solely in the 3-D space before our eyes! In actuality, vision involves 2-D images impacting the retina. Ergo, regardless of whether the light emanates from or is reflected by objects in the 3-D environment, the eye projects these onto what is essentially a 2-D receptive organ, the retina (irrespective of its concave spherical form, it still has only two light-detecting dimensions!).</p>
<p>3-D/2-D Perspective or Omnidirectional Perspective Display << NEW Term >> Swept-plane display 360-Degree Views of 2-D Object</p>	<p>A new type of swept plane display 3-D perspective that enables a flat 2-D image to project the same aspect or perspective geometry from omnidirectional viewpoints or multiple station points, that is, the 2-D image looks identical in perspective projectional terms from a full 360 degree point-of-view (the image does not display viewpoint-dependant geometry outline changes or aspect projection changes). Another way of describing 3-D/2-D perspective is that it produces 360-degree identical views of a flat or 2-D object or scene. See also: Andotrope, Zoetrope, swept plane display, volumetric display.</p>
<p>360-Degree Perspective</p>	<p>Formation/generation/viewing of a 360-degree image/view of the entire surrounding spatial scene, optical vista, or panorama. See: Circle of revolution perspective, circle of vision perspective, cylinder of revolution perspective, cylinder of vision perspective, sphere of revolution perspective, sphere of vision perspective, sphere of vision, looking-out/around / looking-in/at at perspective, circular / spherical / curvilinear / panoramic perspective, Dick Termes and termespheres.</p>
<p>Abaco School Euclid Fibonacci Leon Battista Alberti</p>	<p>In his <i>Elements</i>, Euclid explored the basic properties of ratios and proportions of lines and surfaces, as well as their equivalents and transformations. In the 13th century, interest in these problems was revived by Leonard of Pisa (Fibonacci), who introduced them into the curriculum of the Abaco school. In 1430, Leon Battista Alberti applied these geometrical principles to perspective in his <i>Elements of Painting</i>. Piero della Francesca (c.1480) developed this approach, devoting the first two books of <i>On perspective of painting</i> to these geometrical demonstrations based on proportional diminution.</p>
<p>Abacus</p>	<p>An abacus, also called a counting frame, is a hand-operated calculating tool used from ancient times until the adoption of the Arabic numeral system. An abacus consists of a two-dimensional array of slidable beads. In early designs, the beads (or stones, etc) could be loose on a flat surface. Later, the beads were made to slide on rods and built into a frame, allowing fast manipulation.</p>
<p>Aberrated Perspective Projection (Ref. Partially Inverse Axonometry)</p>	<p>A class of artificial perspective drawing, view, or representation (typically using graphical or New Media / digital perspective but may include optically produced kinds of anamorphic distortion), whereby the appearance of the object and/or scene suffers severe large-scale aberrations in terms of (for example) distorted or altered image size/shape/position elements. Example: Partially Inverse Axonometry. See: work of Noel Blotti. See: artificial perspective, graphical perspective, digital perspective, computer perspective, new media perspective, simulated and synthetic perspective, anamorphic perspective.</p>
<p>Aberration (Chromatic) Instrument Perspective</p>	<p>Chromatic aberration, or colour fringing, is a colour distortion that occurs when an optical system (containing refractive elements) cannot focus all colours of light (from an object point) onto the same point on the image plane. It's caused by the system's refractive index, which varies depending on the wavelength. See: aberrations (optical systems), aberrations (1,2), aberration (blur-spot size), light, light-ray.</p>
<p>Aberration - Optical (Blur-Spot size) Instrument Perspective Blur Spot Size Circle of Confusion Wave Optics Perspective Phenomena Eye / Lens / Camera</p>	<p>Optical aberration is a property of optical systems, such as lenses, that causes light to spread out over a region of space rather than being focused to a point. Aberrations cause the image formed by an optical system (of a point source) to become blurred or distorted, with the nature of the distortion depending on the type of aberration. In ray optics, the (geometrical) blur spot size is the diameter of the circle of light that results when a lens is out of focus (the size of this circle may, however, be limited by wave optics in reality), or when the the rays from an object point suffer from a one or more aberrations such as spherical aberration, coma, etc. The size of the (geometrical) blur spot depends on the distance from the lens and the optical system's quality. Another related concept is the circle of confusion (CoC), which is the maximum acceptable blur spot size that still appears sharp to the human eye. The CoC serves as a threshold that defines the depth of field, whereas blur spot size is the physical reality. Note that the most common type of macroscopic image aberration is distortion. Whereby, distortion or incorrect image shape can (often) be classed as a perspective image distortion (or phenomena), in which the projected image shape is incorrectly structured/proportioned, scaled, and/or incorrectly positioned, et See: aberrations (optical systems), aberrations (1,2), aberration (blur-spot size), light, light-ray.</p>

TERM	DEFINITION
<p>Aberrations: Classes (1, 2 [A, B]) << NEW / REFINED Term >></p> <p>Optical Class Distortion Class</p> <p>Natural / Artificial Perspective</p>	<ol style="list-style-type: none"> Optical aberration: image point defects: An optical defect in which rays from a point object do not form a perfect point after passing through an optical system (eye, lens, camera, etc). This class of aberration can be accurately assessed or measured relative to paraxial optics, or pin-hole lens/camera optics. Common monochromatic types include: spherical, coma, astigmatism, and higher-order aberrations. Plus all aberration types can vary with the wavelength of light, named as chromatic aberrations (colour). Distortion: image shape/form/structure defects that arise due to viewpoint geometry relative to object structures in the environment or object space (i.e. aberrations not due to imaging system characteristics alone): Distortion or incorrect image shape can (often) be classed as a perspective image distortion, in which the projected image shape is incorrectly structured/proportioned, scaled, and/or incorrectly positioned, etc. Many times this class of aberration, or distortion, in a perspective image cannot be objectively measured, because: <ol style="list-style-type: none"> Shape/form is subjective and/or dependent on perspective type: it may be unclear what the correct or most natural shape for an image/view is, and in relation to which types of perspective. For example, is a visual, linear, curvilinear, spherical projection more or less real than other types. Shape/form is multi-faceted: image shape depends on a number of different factors, including viewpoint, viewing angle, projection surface shape/position, projection scale, and projection scale resolution, etc. <p>N.B. Parallel perspective or primary views may be less susceptible to distortion and/or shape distortions.</p> <p>See: size/shape/scale problem, shape sufficiency problem, equivalence / correspondence problem, projection scale, projection scale resolution, Florensky (Pavel), objective perspective, validity of linear perspective.</p>
<p>Aberrations: Types (optical system) [1, 2, 3, 4, 5]</p> <p>Instrument Perspective</p> <p>Lens / Camera / Telescope / Microscope</p>	<p>A Lens or other optical imaging system will exhibit certain image defects or optical aberrations whenever we consider light rays that enter the optical system outside an infinitesimally small region surrounding the optical axis, named the paraxial region. A well-designed optical system still has these aberrations, which degrade image sharpness and other properties, but is partially corrected for rays that enter the optical system at a finite distance from the optical axis.</p> <p>The primary optical aberrations are as follows:</p> <ol style="list-style-type: none"> Spherical aberration: variation of focus with aperture. Coma: variation of magnification with aperture. Astigmatism: rays that propagate in two perpendicular planes (sagittal/tangential planes) have different foci. Field curvature: the region of the sharp image is typically generated on a curved focal region. Positive lenses (positive converging power) introduce inward image curvature, and negative lenses introduce outward curvature. Distortion (optical system introduced type): images of off-axis points depart from the paraxial expressions of image formation, that is, the shape of the images changes with field position. Classic types of optical system distortion include: negative distortion, pincushion distortions or inward-curving distorted object lines, and barrel distortions or outward-curving distorted straight lines. <p>See: Lens, light, aberrations (1, 2), aberration (optical), aberration (chromatic).</p>
<p>Abney Level / Clinometer</p>	<p>An Abney level or clinometer is a surveying instrument that consists of a fixed sighting tube, a movable arm spirit level, and a protractor scale. An internal mirror allows the user to see the bubble in the level (helping to keep the instrument level) while sighting a distant target.</p>
<p>Absolute Perspective (1, 2)</p> <p>Visual Theory Philosophy</p>	<ol style="list-style-type: none"> Perspective as a symbolic form (see: objective perspective) A claim that visual perspective (2nd type or retinal perspective), or another form of perspective, is an absolute form or a 'symbolic form' that has universal significance or has a universal source that applies in every situational circumstance. This view implies that perspective (especially linear perspective) is a phenomenon that is purely objective in origin and has no relative or subjective source(s), being a fundamental property and law of the universe (probably a false assumption). See book: Perspective as a Symbolic Form by Panofsky, Erwin (1927, republished 1991). Apparent perspective (curved/converging space) Absolute perspective is also referred to as a type of apparent perspective based on visual perspective (2nd type or retinal) in which apparent space is curved, converging, and limited, with relatively close vanishing points/horizons. See book: Curvilinear Perspective: From Visual Space to the Constructed Image by Flocon A., Barre A. See book: Extreme Perspective! by David Chelsea (2011). See paper by Robert Hansen: This curving world: hyperbolic linear perspective, from the Journal of aesthetics and art criticism, 32. 1973.

TERM	DEFINITION
<p>Absorption (1, 2)</p> <p>Light Atmospheric Perspective (A) Aerial Perspective (1) Blue or green tint to distant objects</p>	<p>1. Absorption of light Absorption of light (electromagnetic or EM radiation) is how matter (electrons bound in atoms) takes up a photon's energy, and so transforms electromagnetic energy into internal energy of the absorber (for example, thermal energy). A notable effect of the absorption of EM radiation is attenuation, the gradual reduction in the intensity of light waves as they propagate through the medium.</p> <p>2. Atmospheric Absorption / Scattering for Perspective View/Image Atmospheric absorption of electromagnetic radiation is the attenuation of radiation, or reduction in light intensity. Objects closer to the viewer appear more articulate, detailed, and higher in contrast. Objects farther away in space are blurrier, lower in contrast, and have less detail. The further away things are, the more atmosphere you have to look through, making objects appear lighter. Distant objects also appear blue or green because light scatters in the atmosphere. When looking through the atmosphere at a distant object, Rayleigh scattering happens. This phenomenon causes shorter wavelengths of light, like blue, to scatter preferentially into the beam of sight/vision, while longer wavelengths scatter less, leaving (for example) distant mountains or forests to appear blue (or more blue than they are).</p>
<p>Abstract Art</p> <p>Art Movement Aspective Mondrian, Miro, Picabla, Malevich, Kupka, Richter, Rothko, Klee, etc.</p>	<p>Abstract art emerged during the early 20th century, and uses a novel visual language of shape, form, colour, and line, to create a composition that has a degree of independence from visual references in the world. Abstract art, non-figurative art, non-objective art, and non-representational art are all closely related terms. The term can be applied to art based on an object, figure, or landscape, in which forms have been simplified or schematised (typically without the perspectival recession of linear perspective). It is also applied to art that uses outline forms, such as geometric shapes or gestural marks, which have no source in an external visual reality. Artists who worked in this genre include Kandinsky, Mondrian, Miro, Picabla, Pollock, Malevich, Richter, Rothko, Kupka, Klee, etc. Also relates to the so-called Rayonism art movement from artists Goncharova and Larionov.</p>
<p>Abstract Perspective</p> <p><< NEW / REFINED Term >> Artificial Perspective</p>	<p>Any perspective method/system or view/image that has not been directly captured/imaged from physical reality, or a perspective image/view that has been altered, changed, or processed in some way, and does not directly relate to physical or an optically true/correct reality (partially, wholly, or in actuality). Resultant perspective views/images are judged to be (at least partially) mathematical, fictional, or (physically) unreal, or possess related aspects/features. It has been claimed by some experts that all types of visual/optical/technical perspective are at least partly abstract, or that perspective may be fundamentally an abstract or subjective method.</p> <p>See: true perspective, geometry, levels of abstraction, shape sufficiency problem, perspective as a symbolic form (art/perspective theory as developed by E. Panofsky), subjective / objective perspective.</p>
<p>Abstract Shape</p>	<p>Abstract shapes are created by abstracting (or seeing/perceiving) the most basic and recognisable aspects of a real-life scene/object shape and creating a simplified representation of it.</p> <p>See: true perspective, geometry, levels of abstraction, scale/shape/size problem, shape sufficiency problem, equivalence/correspondence problem, regular geometry, platonic solids, Forms.</p>
<p>Academic Perspective</p> <p>Definition Characteristics Central Perspective Linear Perspective One-Point Perspective Two-Point Perspective Three-Point Perspective</p>	<p>Identical to linear perspective (one, two, three-point perspective). A type of artificial/graphical perspective used as a drawing/representation method, which was first used by Brunelleschi around the year 1412-20, and later codified by Leon Battista Alberti in his book Della Pittura.</p> <p>Academic perspective (linear form) has eight principal characteristics:</p> <ol style="list-style-type: none"> 1) There is no apparent distortion of straight lines present in object space; 2) There is no apparent distortion or foreshortening of objects parallel to the picture plane, which is therefore given emphasis; 3) The apparent size of objects diminishes in an exact proportion to their distance from the observer, so that all quantities are measurable (ref. single unified spatial scale); 4) Sets of receding parallel orthogonal lines (along the central axis) appear to converge to a single vanishing point, dependent on the fixed position of the observer's eye; 5) Sets of parallels co-planar with the ground plane converge to vanishing points on the horizon line; 6) For linear perspective along the ground plane, objects higher up are further away. 7) Aspect perspective: degradation of form according to projection angle. 8) Foreshortening (combined): dimensions aligned along the depth direction are contracted in apparent size relative to dimensions in the orthogonal plane (aspect/axometric foreshortening + perspectival/optical foreshortening due to size/distance law). <p>Academic perspective is characterised by a fixed eye that views a scene from a stationary vantage point (image snapshots); whereby the scene is viewed over a relatively narrow field-of-view, which prevents curvilinear and other wide-field optical distortions.</p> <p>Synonyms: Linear perspective (one, two, three-point perspective), central perspective.</p>

TERM	DEFINITION
Academies Art / Drawing Schools	<p>Drawing Academies and Academies of Fine Art, particularly in Rome, Florence, Milan, Paris, and London, offered drawing instruction and thus taught perspective methods. Such schools, which began in the sixteenth century, had been aimed only at a select body of professions (painters, architects, goldsmiths, etc.), but later spread in the seventeenth and eighteenth centuries to general artistic schools and academies, and in the nineteenth, to trades, secondary schools, primary schools and ultimately all interested laymen. Drawing, and the perspective it entailed, had thus become part of learning how to see, a basic ingredient seen as a founding stone of human civilisation.</p>
Accelerated Perspective (1, 2) Illusion Forced Perspective Amplified Perspective Simulated Perspective Synthetic Perspective	<p>1. Horizontal convergence Accelerated perspective is a type of simulated and (possibly) synthetic perspective (apparent spatial structure) that (for example) employs forced perspective to increase the perspective recession, or increase the converging angle of lines directed towards vanishing points, and so to increase the apparent depth. See: decelerated perspective.</p> <p>2. Vertical/upward convergence Refers to increasing the apparent height of a tower or elongated vertical object, in which the perspective vista appears deeper in the vertical dimension, and by bringing the (apparent) vertical parallels to a vertex faster than with ordinary vanishing point recession by 'distance alone' and thus we use forced perspective to increase the perspective recession, or increase the converging angle of lines directed towards vanishing points, and so to increase the apparent depth. Synonyms: Forced / amplified perspective, simulated / synthetic perspective, perspective illusion.</p>
Accidental Measuring Point	<p>Refers to measuring points as used for a type of linear perspective named Accidental Perspective (2), with secondary vanishing points, and potentially a secondary horizon line, etc. See book: Perspective for Art Students by R.G. Hatton, 1924.</p>
Accidental Perspective (1, 2, 3) Artificial / Graphical Perspective Linear perspective	<p>1. Alternative name for linear perspective (one/two-point type) One of Leonardo da Vinci's names for pictorial or linear perspective.</p> <p>2. Accidental/secondary vanishing point perspective Refers to graphical perspective having angular situations other than the special case(s) of perspective projection of orthogonal parallel lines (in object space) and/or 45-degree orientation of parallels (in object space), and so the parallels are not perpendicular to, or at a 45-degree angle to, the picture plane. See: secondary vanishing points, accidental vanishing point, secondary horizon, unlimited vanishing point perspective.</p> <p>3. Accidental viewpoint (unique/eccentric viewpoint) An accidental viewpoint (eccentric or fixed viewpoint) is a singular position from which an image can be perceived (correctly or as intended), creating either a temporary or limited (vantage point) image, an ambiguous image, or an illusion that is visible from that position alone.</p>
Accidental Vanishing Point Natural, Graphical and Visual Perspective (2)	<p>Synonym for: Vanishing Point - Accidental (4).</p> <p>The vanishing point of a group of lines that are parallel neither to the direct radial, nor to the horizontal line (A). It is further distinguished as Aerial or Terrestrial Vanishing Point as it is above or below the horizontal line. See: Vanishing Point, Vanishing Point - Accidental (4), Aerial or Terrestrial Vanishing Point.</p>
Accolti Perspective Graphical Perspective	<p>Accolti perspective is a method of perspective drawing for artists developed by Pietro Accolti. Accolti's work on perspective is documented in his book <i>Lo inganno de gl'occhi: prospettiva pratica</i> (1625), which translates to Practical Perspective. Accolti's work on perspective was influential in the field of art. For example, Joseph Mallord William Turner created a diagram of Accolti's perspective method for a cube around 1809.</p>
Accommodation Eye Visual Perspective	<p>Human eye accommodation is the process by which the eye changes its optical power to keep an object in focus (seen with good optical clarity) as its distance varies. This happens when the lens of the eye changes shape to allow light rays to bend more or less strongly:</p> <ul style="list-style-type: none"> • Near objects: The lens becomes thicker and more rounded to focus on nearby objects. This allows light rays to bend more strongly, or at a greater angle of refraction, thus bringing images of near objects to a sharp focus on the retina. • Distant objects: The lens flattens to focus on distant objects. This allows light rays to bend slightly, or at a lesser angle of refraction, thus bringing images of distant objects to a sharp focus on the retina. <p>See: optics of eye, visual perspective (2nd type), focus/defocus, depth of field. See books: Optics, Painting and Photography by Piriene, M.H. (1970). Eye and Brain by R.L. Gregory (1998).</p>

TERM	DEFINITION
<p>Actual Horizon Natural and Visual Perspective (2)</p>	<p>Synonym for: outdoor visible/physical/observed sensible horizon line.</p> <p>Patently, we have different kinds of horizon line. Notably, we have the actual or optical/observed horizon, where earth and sky appear to meet, excluding obstructions like hills or mountains. On a flat plane, this outdoor/physical/sensible horizon line, is formed by the infinite extent of the ground plane and is where the vanishing points of sets of parallel lines lying on the ground plane appear to meet at a unique vanishing point lying on the horizontal line that is the actual horizon or actual horizon line.</p> <p>See: Horizon, horizon line, visible horizon, outdoor horizon, sensible/observed horizon, physical horizon.</p>
<p>Acuity Perspective Visual (2) / Instrument Perspective Aberration Image Sharpness Resolution Shape-Form Sufficiency Problem</p>	<p>Refers to gradients of distinctiveness, sharpness, clarity, and detail that are produced at different distances from the observer. There are two basic types of visual acuity: that of distance or depth, and that which is regulated by the accommodation of the eye (adjustment of focus for object size and object distance across the visual field). Other factors may also come into play in a real-world perspective system (ref. instrument perspective), such as contrast blurring, projection scale resolution, the shape/sufficiency problem, and other optical effects related to resolution limitations for an optical system. Acuity perspective is accomplished in painting and sculpture by reducing the finish (surface detail) of distant objects, eliminating graphical detail, blurring edges of contours and interior forms, rounding angles, and eliminating (visual depth) cues of texture.</p> <p>See also: perspective of visual acuity, diminution of form, shape sufficiency problem.</p> <p>See book: Art and Illusion by Ernst Gombrich (1960). See book: Perspective: Fundamentals, Controversials, History by G. Ten Doesschate (1964) See paper: The Vertebrate Eye by R.A. Weale (1978). See paper: The Information Available in Pictures by J.J. Gibson (1971).</p>
<p>Acute Line</p>	<p>A straight line that measures less than 90 degrees relative to another line or plane is an acute line.</p>
<p>Adaptation (Eye)</p>	<p>Eye adaptation is the ability of the eye to adjust to different levels of light and darkness. The eye's iris, retina, and pupil work together to perform this adjustment. See: optics of eye.</p>
<p>Adjusted Perspective Natural / Environmental Perspective Graphical Perspective Visual Perspective (2) Instrument / New Media Perspective False Perspective Distortion Image Correction</p>	<p>Adjusted perspective is the process of correcting a photo or represented image's perspective distortion to make it more visually appealing and balanced. It can also be called perspective correction, perspective control, or keystone correction. The image adjustment can be done in the camera itself using a slanted or variable-tilt relocating mirror, optics-tilt, an image-plane tilt, etc. Alternatively, the perspective distortion adjustment can be made post-image capture using digital image processing methods or during film development using optical projection techniques.</p> <p>Definition</p> <ul style="list-style-type: none"> • A highly distorted perspective can make photos look cluttered and unprofessional. • It can make subjects appear unnatural in their environment. • It can be caused by using the wrong lens or by holding the camera improperly. • It can be caused by using an extreme angle of view or an oblique aspect, for example, by taking a photograph looking up at a very tall building. <p>How to adjust perspective for an image (post-capture)</p> <ul style="list-style-type: none"> • Use the Upright feature in Lightroom: because it can automatically correct perspective in photos. It offers options like Level, Vertical, Auto, and Full. • Use the Transform panel in Lightroom: The Upright feature can correct distorted perspective. • Use the Transform dialog in Photoshop software.
<p>Advanced Perspective Optical Modelling</p>	<p>Sophisticated representation or model of spatial reality (highly technical image/model)</p> <p>Any category/form of artificial/graphical perspective image/view that employs sophisticated optical modelling and image construction processes and that result in the depiction of realistic perspective phenomena, including the creation of correct and possibly unlimited numbers of vanishing points and related optical distortions, etc.</p> <p>See: digital / computer perspective, New Media perspective, CAD / CGI.</p>
<p>Aerial Accidental Vanishing Point</p>	<p>Accidental vanishing point located above the horizontal line.</p> <p>See: Vanishing Point, Vanishing point - accidental (4), terrestrial vanishing point.</p>
<p>Aerial Perspective - Basin-like appearance of Earth</p>	<p>If we ascend in an airplane, we shall find that the distant horizon rises with our height, but it appears to remain at eye level. This accounts for the peculiar basin-like appearance of the earth when viewed from a great height or when flying in an aeroplane/balloon (ref. aspect perspective).</p>

TERM	DEFINITION
<p>Aerial Perspective (1, 2, 3)</p> <p><< NEW / REFINED Term >></p> <p>Atmospheric Perspective</p> <p>Synonym for Three-Point Linear Perspective</p>	<p>Aerial perspective concerns the appearance of spatial objects/scenes as affected by the air, light and shade, and colour.</p> <p>1. Sophisticated representation or model of diminution of colour and contrast</p> <p>Aerial Perspective (in terms of graphical perspective) is the art of giving due diminution of the (represented) strength of light, shade, and colour of objects, according to their distances and the quantity of light received by them, and to the medium through which the object is seen or presented as seen. It is the graduation of light and shade on various objects as they recede from the eye.</p> <p>2. Natural space diminution of Colour and Contrast</p> <p>Refers to the combined visual effects of the diminution of colour and contrast with increasing distance from the viewer; and as a result of the interaction of light rays with the atmosphere due to the effects of light extinction (absorption + scattering of light rays by atmospheric molecules).</p> <p>Aerial Perspective [1, 2]: See: absorption (of light by atmosphere). Synonyms: atmospheric perspective.</p> <p>3. Three-Point Linear perspective</p> <p>Synonym for three-point linear perspective view/image in which we observe, or represent a view as seen, from a high vantage point relative to (for example) a cubic-shaped object.</p>
<p>Aerial Perspective of a Cube</p>	<p>Synonym for: Three-point perspective view / representation of cube.</p>
<p>Aerial Pyramid</p> <p>Linear perspective</p> <p>Vanishing point</p> <p>Spatial recession</p>	<p>Refers to the apparent pyramid of spatial recession when flying over a cityscape (for example); in which sets of parallel lines in object space recede towards a distant vanishing point (often a central or primary vanishing point for orthogonal lines along central axis of vision), forming a pyramid-shaped image or view.</p> <p>See: central perspective, linear perspective, pyramid of recession.</p>
<p>Aerial Schematic Perspective</p>	<p>A type of perspective image that depicts a spatial scene from a great height, relative to the ground plane, for example, a photograph of a city from 2000 feet in the air. Normally, the image is taken at an angle of around 30-45 degrees relative to the ground plane to provide an enhanced perspective view of buildings and other features.</p> <p>See: aerial / central perspective, linear perspective, pyramid of recession.</p>
<p>Aerial Surveying</p> <p>Aerial Perspective</p> <p>Stereo Mapping</p> <p>Drones</p> <p>Instrument Perspective</p> <p>Photography</p>	<p>Aerial surveys involve collecting high-resolution geospatial, topographic, or imaging data of land, structures, or environments from above using drones (UAVs), planes, or helicopters. They are essential for rapid, cost-effective, and safe data acquisition in construction, agriculture, archaeology, and environmental monitoring. Aerial surveys often use pre-programmed flight paths, with data processed by software to create highly detailed maps and 3-D models, sometimes replacing traditional manual "stereo mapping".</p> <p>Key Aspects</p> <ul style="list-style-type: none"> • Methods & Technology: Utilises drones, aircraft, and sensors like Lidar, multispectral cameras, and thermal imaging to capture data. • Applications: <ul style="list-style-type: none"> • Construction & Infrastructure: Monitoring project progress, inspecting, and mapping large, inaccessible areas. • Environmental & Agriculture: Assessing crop health, environmental impact, and wildlife/marine mammal monitoring. • Archaeology & Heritage: Recording sites, earthworks, and monuments from the air. • Advantages: Provides a rapid, comprehensive overview, reduces or eliminates the need for personnel to work at height, and offers superior accuracy over large areas. • Data Outputs: Produces detailed 3-D models, digital surface models, orthomosaic maps, and aerial photographs. <p>See: aerial perspective, stereo mapping, orthomosaic maps, drones.</p>
<p>Aerial Views</p>	<p>A perspective image/view captured from, or represented as being taken from, an elevated height such as from a machine in flight, a balloon, a satellite camera, or from a mountain top, etc.</p>
<p>Aeroplane / Flying Perspective</p>	<p>Any perspective method/system that is in flight, or any perspective image/view captured from such a machine in flight.</p>

TERM	DEFINITION
Aesthetic Perspective Drawing / Painting Graphical perspective	An aesthetic perspective is the artistic application of perspective to adequately represent the subject of a drawing/painting/graphic. For example, if we are overlooking a battle scene on an open plain, nothing is distinguishable if the eye is on level with the plain; more is comprehended when the eye rises above the plain, or is inclined and can see everything in a bird's-eye view. Perspective is always a visual technique that must be purposefully, judiciously, and artfully employed; because there may often be a better vantage point from which the scene is more clearly perceived and understood.
Affine Perspective Mathematical Perspective	An affine mathematical or graphical perspective image is a type of linear geometric transformation that preserves parallel lines, whereas the opposite type the so-called perspective transformation (aka perspective recession etc.) is used to create perspective distortion(s), including the formation of vanishing points, etc. We can distinguish the two types of projections as follows: <ul style="list-style-type: none"> • Affine transformations A linear mapping method that preserves points, straight lines, and planes. Affine transformations are used to correct for geometric distortions caused by non-ideal camera angles. They are also used for scaling, skewing, and rotation. Affine transformations require a 2x3 transformation matrix, and this is within the mathematical model. Affine transformations are not limited to simple objects like lines. While they are defined by their ability to map straight lines to straight lines and preserve parallelism, they are routinely applied to complex shapes, 3D models, and entire images in computer graphics, computer vision, and robotics • Perspective transformations Used to create perspective distortion by showing how the perceived objects change as the observer's viewpoint changes. Perspective transformations require a 3x3 transformation matrix, and this is within the mathematical model.
Affordances Perspective Phenomena Visual / Ecological Perception James J. Gibson	Affordances are the perceived opportunities for action that objects/surfaces in the environment offer humans/animals, and they are a key part of visual perception theory. Affordance is the ability of an object to evoke its use or function. It is a directly perceivable quality exuded by an object that encapsulates the relationship between an agent (or human) and its environment, and how the agent perceives what they can do with objects. For example, a flat surface may afford sitting, a door opening, while a button might afford pushing. The term was introduced by psychologist James J. Gibson in his 1966 book, <i>The Senses Considered as Perceptual Systems</i> . See: visual perception (2nd type), James J. Gibson.
After-image Visual Perception Visual Perspective (2)	An image that continues to appear in the eyes (visual field) after a period of exposure to the original image. An afterimage may be a normal or physiological phenomenon (physiological afterimage) or be psychological (Illusory palinopsia). Physical afterimages occur because photochemical activity in the retina persists even after the original stimulus is no longer present. A common physiological afterimage of a bright object, such as light, is the dim area, or shape, that appears to float before the eyes after looking into said bright light source.
Aggregate Space	A form of representational, image, or graphical space used in Antiquity, without a definitive, objective, and systematic connection between observer and object. Opposite to the system space of Renaissance perspective, which is a unified or integrated space that (for example) exhibits a single central or primary vanishing point for apparently converging lines, that is, orthogonal parallel lines in object space. See: ancient perspective, linear and Renaissance perspective.
AI Drawing Artificial Intelligence Drawing	AI or Artificial Intelligence drawing, in essence, means using artificial intelligence technology to create images, graphics, or artwork. New software tools and applications can generate visuals from textual descriptions or learn from existing art styles to produce unique pieces. See also: Generative AI, Optical Artificial Intelligence.
Aiming Circle	An instrument for measuring horizontal and vertical angles and magnetic azimuths (horizontal angular directions) in determining gunnery data and laying guns and in artillery surveying.
Airfoot / Foot / Footpoint Visual Perspective (2nd type) Surveying Perspective	A point lying on a horizontal or ground plane vertically in line with the point of sight (1), the nadir, and the zenith. Relates to both visual perspective (2nd type) and a linear perspective construction (process). Also relates also photographic/surveying perspective. Synonym for: Foot (of Perspective). See: visual perspective (2nd type), surveying / linear perspective, Foot (of perspective).
Airy's disk	The Airy disk or Airy pattern is the best-focused spot of light that a perfect lens or perfect optical system with a circular aperture can make, limited by the diffraction of light (for the aperture size/shape in question). The Airy disk is important in physics, optics, and astronomy, because it sets a fundamental limit on the attainable resolution or resolving power of any optical system.

TERM	DEFINITION
Airy's Projection Maps Cartography	<p>Airy's projection is a 2-D map projection for the 3-D spherical Earth, a method that minimises the mean-square scale error. It is an azimuthal projection, which means it projects map data onto a flat surface that touches a globe at a single point.</p> <ul style="list-style-type: none"> • The Airy projection is used to map regions within a small or great circle. • The projection's meridians are equally spaced straight lines that intersect at the central pole. • The projection's parallels are nearly equally spaced circles centred at the pole. • The projection's spacing increases slightly away from the centre.
Alberti, Leon Battista Artist, Author, Mathematician	<p>Leon Battista Alberti (1404 – 1472) was an Italian Renaissance humanist, author, artist, architect, poet, priest, linguist, philosopher, and mathematician, and he epitomised the polymath. He is considered an important developer/recorder of the invention of linear perspective in drawing/painting, first developed by Brunelleschi around 1412-1420. Panofsky's (1927) interpretation of <i>Alberti's costruzione legittima</i> method for producing a linear perspective graphical construction remains standard.</p> <p>See: linear perspective, central and renaissance perspective.</p>
Albertian Perspective	<p>Another name for linear perspective, named after Leon Battista Alberti.</p>
Alethescope Graphoscope	<p>Uses a single rectangular convex lens to view photographs, where using perforations, hand-colouring, and the lens, an impression of simulated stereoscopy is obtained. The unit is mounted on a wooden cabinet holding the photographs. Also known as a graphoscope, it dates to the mid 1800s.</p> <p>See: 3-D, 3-D perspective, 3-D perspective: stereoscopy (5 - A, B ,C) photography, stereoscopy.</p>
Algebraic Perspective	<p>Reference to the application of numbers and algebra to probe and represent, spatial reality.</p> <p>See also antonym: Continuous analysis or geometry (geometrical perspective).</p>
Alhazen Mathematician Astronomer Physicist	<p>Ḥasan Ibn al-Haytham latinised as Alhazen (965 – 1040) was a medieval mathematician, astronomer, and physicist of the Islamic Golden Age from present-day Iraq. Alhazen, also known as Ibn al-Haytham, pioneered the study of light and vision. His work influenced the development of perspective in painting and other artistic techniques during the Renaissance. He is said to have invented/tested the camera obscura, a precursor of the modern photographic camera.</p> <p>Light and vision</p> <ul style="list-style-type: none"> • Alhazen was the first to propose that light comes from objects, not the eye. • He believed that light travels in straight lines from objects like lanterns. • He described how the eye receives light reflected from objects. • He believed that the image formed in the eye was inverted, but mistakenly thought that light entered the optic nerve upright (as did Leonardo da Vinci). <p>Mathematics and scientific methodology</p> <ul style="list-style-type: none"> • He believed in using mathematical and quantitative methods to study phenomena. • He developed analytical geometry and scientific methodology. • He used conic sections to solve Alhazen's problem, which determines the point of reflection from a surface. <p>Astronomy</p> <ul style="list-style-type: none"> • He accepted the geocentric model of the universe, but he eliminated the so-called equant from Ptolemy's models. An equant is a historical astronomical concept to explain planetary motion. • He wrote The Model of the Motions of Each of the Seven Planets around 1038.
Alice in Wonderland Syndrome	<p>Alice in Wonderland syndrome, or Todd's syndrome, is a rare neurological disorder that distorts perception, causing people to see objects as smaller (micropsia) or larger (macropsia) than they are, or as closer or farther away.</p>
Alidade (Dioptra / Dioptra) Protractor / Goniometer Instrument / Visual Perspective (2)	<p>A device that allows one to sight a distant object and use line-of-sight to perform a task. This task can, for example, be to triangulate a scale map on site using a plane table drawing of intersecting lines in the direction of the object from two or more points, or to measure the angle and horizontal distance to the object from a reference point's polar measurement. Triangulation is the process of determining the location of a point by forming triangles to the point from known points. Angles can be measured horizontally, vertically, or in any chosen plane. The alidade sighting ruler was originally a part of many scientific and astronomical instruments.</p> <p>At one time, some alidades, particularly those with circular graduations like those on astrolabes, were also called diopters/dioptra. The dioptra is a sighting tube, or a rod with a sight at both ends, attached to a stand. If fitted with one or more protractor(s)/goniometer(s), or circular measuring dials, it could be used to measure angles.</p>

TERM	DEFINITION
<p>Alignment Line (1, 2)</p> <p>Visual Perspective (2nd type or retinal) Linear Prospective</p>	<p>1. Connected spatial positions (object and image space) An imaginary visual, actually present, or sketched, line that accurately connects one or more visual features in a perspective image; for example, a line can be drawn between multiple object positions such as the edges of a row of columns.</p> <p>2. Sight line along the central axis of vision A line that defines the direction of look, projection, or the optical axis of eye/camera/telescope, etc.</p> <p>Synonyms [type 2]: Angle of View (1), Angle of Vision (1), Axis Line, Axis of Cone of Vision, Axis of Pyramid Of Vision, Axis of Vision, Axis of Visual Pyramid, Central Axis, Central Axis of Vision, Central Ray, Central Visual Ray, Centre Line, Centre Line of Vision, Centre of Vision (2), Direct Line of Sight, Direct Line, Direct Line of Vision, Direction of Gaze, Direction of Projection, Direction of Vision, Line of Direction, Line of Projection, Line of Sight, Line of Vision (1), Looking Angle, Observation Angle, Optical Axis, Perspective Axis, Principle Angle, Projection Angle, Sight Line, Viewing Angle (1), Visual Axis, Visual Ray (principle), Visual Axis, Visual Direction, Alignment Line (2).</p>
<p>All-Over Perspective (1, 2, 3)</p> <p><< NEW / REFINED Term >></p>	<p>1: Abstract Expressionism: Similar to the 'all-over' construction of Abstract Expressionism, as it tends to generalise the pictorial energy across the whole canvas so as to create a 'plenum' or rigorous continuum.</p> <p>2: Synonym for pigeon-hole perspective.</p> <p>3: Synonym for multi-view perspective or cubist perspective.</p> <p>See: Proxemic Perspective, unistic perspective, pigeon-hole perspective, Intermediary or mixed perspective, arabesque perspective, tachiste perspective, spherical perspective, axial perspective, cubist perspective, inverted perspective, bird's eye perspective, staggering perspective, ambiguous perspective.</p>
Allegory (visual)	Use of visual metaphor in the treatment of literary space leads to the use of visual allegory in time.
Almanac (Perpetual)	A calendar that can track or establish quantities that change over time; for example, the Perpetual Almanac on Celestial Motions was written by the astronomer Sephardi Abraham Zacuto in the 15c. It was for oceanic navigation, and by sailors such as Christopher Columbus and Vasco da Gama.
Almucanter (Quadrant)	See: quadrant.
Almucanthar (1, 2)	<p>1. Astronomy: a circle on the celestial sphere parallel to the horizon; a parallel of altitude.</p> <p>2. Telescope: a telescope mounted on a mercury float, used to determine stellar altitude and azimuth.</p>
Altazimuth Mount	An altazimuth mount or alt-azimuth mount is a simple two-axis mount for supporting and rotating an instrument about two perpendicular axes, one vertical and the other horizontal. Used with telescopes, cameras, radio antennas, heliostat mirrors, solar panels, guns, etc.
Alternative Picture Plane Perspective	Any category of perspective, or image-form, where the picture plane, is other than planar/flat.
Altitude	The vertical height of an object or structure above a reference level, usually above sea level or the Earth's surface. Altitude can be measured in spatial or angular units.
<p>Altitude / Azimuth (Alt / Az) Coordinates</p> <p>Astronomy Celestial Sphere Instrument Perspective Camera / Telescope</p>	<p>Altitude and azimuth are two angles that describe the position of an object in the sky. They are used in astronomy, navigation, and gunnery.</p> <p>Altitude</p> <ul style="list-style-type: none"> • The height of an object above the horizon, measured in degrees • An object on the horizon has an altitude of 0°; and one overhead has an altitude of 90° • Also known as elevation or apparent height <p>Azimuth</p> <ul style="list-style-type: none"> • The angle of an object around the horizon, measured clockwise from true north • Azimuth values are computed with respect to true north, not magnetic north • Can be measured with a magnetic compass <p>Applications</p> <ul style="list-style-type: none"> • Together, altitude and azimuth can be used to precisely locate an object in the sky • The Alt-Az system is used to determine when a celestial object is best positioned for viewing
Ambigram Illusion	An ambigram is a calligraphic composition of glyphs (letters, numbers, symbols, or other shapes) that can yield different meanings depending on the orientation of observation. Most ambigrams are visual palindromes that rely on symmetry, typically rotated 180 degrees, and can often be interpreted as visual puns. Most often, ambigrams appear as visually symmetrical words.
<p>Ambiguous Perspective (1, 2)</p> <p><< NEW / REFINED Term >></p> <p>Visual Perspective (2nd type or retinal) Illusion True Perspective</p>	<p>1. Ambiguous image form Perspective that employs ambiguous images or reversible figures that create ambiguity in terms of viewpoint for a perspective view. See rabbit-duck Illusion.</p> <p>2. Ambiguous viewpoint A general property of classic perspective methods (ref. linear, graphical perspective, etc) relates to the use of a stationary or established single viewpoint from which the perspective view/image is correctly formed. However, the ambiguous perspective refers to a class of perspectives that fail to establish (or perhaps require) a single viewpoint for the depicted scene (ref. A type of graphical perspective experimented with by Leonardo da Vinci, and named multi-view flat perspective).</p>

TERM	DEFINITION
Ambiguous Picture Perspective	An ambiguous picture perspective is typically a line drawing of a solid object (for example, a cube) where the brain cannot easily tell which viewpoint is taken and which particular side/face/angle of the object is in view, and the brain will 'flip-flop' in its attempt to perceive a sensible form. See: perspective of cube, wire-frame perspective, three-point perspective.
American Perspective	A dimensional scene depicted from too close a viewpoint, leading to extreme or exaggerated perspective distortions.
Ames Room Perspective Illusion	A special type of simulated and synthetic perspective (real-space structure) in which a room is employed with a distorted shape so as to be magnified in scale towards one corner. People or spatial objects that move, or are moved across, the room appear to grow or shrink in apparent size. See: forced / double perspective, amplified perspective, simulated and synthetic perspective.
Amplified Perspective (1, 2) Illusion Forced Perspective Amplified Perspective	1. Amplified Perspective: Synonym for: Accelerated / Forced Perspective Simulated and synthetic perspective (real-space structure) that employs the technique of forced perspective to increase apparent perspective recession, or increase the angle of vanishing lines directed towards vanishing points, and thus to increase the apparent depth of the optical scene. 2. Amplified Perspective: Increased projection scale/magnification Refers to a magnified view, or an increased projection scale image, of a spatial object/scene. Relates to optical/visual magnification and/or the plate scale of a projected image (imaging form of perspective).
Anaglyph Perspective Print / Display	Anaglyph perspective is a stereoscopic 3-D effect that uses two differently filtered images, one for each eye, to create a 3-D effect. The images are typically filtered with red and cyan, and are viewed through special glasses with a red lens for the left eye and a blue-green lens for the right eye. The brain then integrates the two images to create a 3-D effect. Anaglyph perspective can be used in movies, video games, comic books, and more.
Anaglyphic Perspective	See: Anaglyph perspective print/display.
Analemma Perspective	Diagram showing the apparent path of the sun across the sky at a particular fixed location on the earth.
Analogy	While similes ("like") and metaphors ("is") show comparison, analogies explain the underlying principle of the comparison.
Analytic / Analytical Geometry	In mathematics, analytic geometry, also known as coordinate geometry or Cartesian geometry, is the study of geometry using a coordinate system. Analytic geometry is used in physics and engineering, as well as in aviation, rocketry, space science, and spaceflight. Antonym: Synthetic geometry.
Analytic Cubist Perspective	Describes the early phase of cubism, generally considered to run from 1908–12, characterised by a fragmentary appearance of multiple viewpoints and overlapping object planes.
Analytic Perspective (1, 2)	1. Baroque perspective method Baroque perspective is a technique in art and architecture that creates illusions and manipulates the viewer's perception. Baroque artists used perspective to make objects appear larger, smaller, or further away than they actually are. Techniques include forced/accelerated/decelerated perspectives, anamorphosis, chiaroscuro, etc. 2. Analysis/application of natural or artificial method (e.g. linear perspective) Technical perspective methods using mathematical analysis of optical images, or else the creation of accurate graphical images using points, lines, and vanishing points, etc.
Analytical Perspective	Any perspective method/system that employs purely (or a significant degree of) mathematical or geometrical/optical modelling techniques, and produces a perspective image/view of a spatial scan/object. See: artificial perspective, mathematical perspective, graphical perspective.
Anamorphic Cinema Anamorphic Perspective Distortion Anamorphic / Scope Lens Cinema Perspective Camera Perspective	A special kind of wide-screen cinematic process in which a cinematic camera employs an anamorphic camera lens to capture (plus minify horizontally) a wide field view (horizontal direction), which is then recorded onto a smaller focal plane size (horizontal direction), and thus onto (for example) an ordinary-sized 35mm film. Next, when the same film image is projected using a special camera with an anamorphic image-expanding lens (in the horizontal direction), the result is a wide-field, largely undistorted cinema experience for the audience. These wide-field cinema systems were popular in the 1950s-1960s, serving both as a wide-field captured image and a wide-field observed image. Sometimes an anamorphic camera lens is still used today for the same purpose and is known as filming in 'scope'. See also: anamorphic perspective, scope, spherical, total, circular, panoramic, 3-D (type 3) perspective(s), sphere of vision, looking out/around perspective, cinerama, vista-vision.

TERM	DEFINITION
Anamorphic Drawing	A drawing of a spatial object seen from a specific oblique angle, such that the image appears to be wholly distorted when seen from the usual vantage point, but appears normal when viewed from a particular oblique viewing angle (using perspective anamorphosis), or indirectly in a mirror (mirror anamorphosis).
Anamorphic Lens or Scope Aspect Lens Spherical Lens	The anamorphic process, which uses anamorphic or 'Scope Aspect' lenses to optically squeeze the (horizontal aspect) image onto an ordinary-sized film gauge frame or format (normally 36mm by 24 mm), and thus to optically capture or photograph twice the horizontal area (horizontal field-of-view) relative to the vertical as standard "spherical" or 'Flat Aspect' lenses. See also: anamorphic cinema/perspective, scope, spherical, total, circular, panoramic, 3-D (type 3) perspective(s), sphere of vision, looking out/around perspective, cinerama, vista-vision.
Anamorphic Perspective (A) Distortion Viewpoint	Anamorphic perspective is a form of distorted projection requiring viewers to occupy a specific vantage point or use special devices (like mirrors) to see a recognisable 3-D image from a 2-D surface. Derived from the Greek <i>anamorphoûn</i> ("to transform"), it acts as an optical illusion that hides or distorts images, often used in art, street, and film to create impossible, perspective-defying visuals. See: anamorphic perspective (B) anamorphosis (A,B,C,D), perspective shift, anamorphic suspended sculptures, perceptual art.
Anamorphic Perspective (B:1)	Technical perspective in which an image is distorted (magnified/minified) in scale in one of its cardinal directions (X, Y), leading to an anamorphic image shape. See: anamorphic cinema, anamorphic lens, scope lens, cinerama, vista-vision, wide-field cinema.
Anamorphic Perspective (B:2)	A violent distortion in perspective, from too near a point of view and/or from the injudicious attitude or situation of the object, but it is perfectly true according to the laws of perspective. See books: <i>Aberrations</i> (1957) and <i>Anamorphoses</i> (1969) by Jurgis Baltrusaitis.
Anamorphic Perspective (B:3) Fernande Saint-Martin	Anamorphic Perspective is a Far Distance Perspective (Ref. Fernande Saint-Martin). In medium or distant depths, this perspective modifies in a gradual way the dimensions of one of the coordinates (height or width) of the Euclidean grid, without applying the correlation defined by the law of (optical/perspectival) foreshortening in the linear perspective [foreshortening type 2). Synonyms: Anamorphic Perspective (1) and Anamorphic Perspective (2). See book: <i>Semiology of perspective</i> , and work of Fernande Saint-Martin.
Anamorphic Perspective Illusion	Refers to an anamorphic perspective illusion painted onto the wall of a room/corridor, etc, whereby (for example) the (ostensibly distorted) image of a spatially flat ghost appears to change from 2-D to 3-D, and 'pop' or extend outwards into space or 3-D when viewed from the correct viewpoint, or from a particular viewing angle. A type of visual perspective illusion that is partly psychological and partly optical/graphical in origin.
Anamorphic Suspended Sculptures Anamorphic Perspective (A) Visual Perspective (2nd type) Visual Perception Illusion Distortion / Viewpoint Forced Perspective Perspective Shift Perceptual Art Michel Murphy Jonty Hurwitz Matthieu Robert-Ortis Bernard Pas	Anamorphic suspended sculptures are 3-D, often abstract installations designed to reveal a coherent, recognisable image only when viewed from one specific station point. They are a form of installation art that uses distorted, often fragmented, three-dimensional forms hung in physical space (from strings/wires) to create an image visible only from a single viewpoint. This art form relies on perspective anamorphosis, requiring the viewer to move to a predetermined vantage point to see the intended, coherent image, whereas from any other angle, the sculpture appears to be a random arrangement of objects or abstract shapes. Artists and Works <ul style="list-style-type: none"> • Michael Murphy: Murphy creates sculptures using hundreds of elements (like wooden balls) suspended from the ceiling. A famous example is <i>Perceptual Shift</i> (2015), which appears to be a jumble of 1,252 painted wooden balls but, from a specific spot, reveals the image of an eye. • Jonty Hurwitz: Creates anamorphic sculptures that often rely on a polished, mirrored cylinder to correct the distortion. His work, such as <i>The Kiss</i> or <i>The Thinker</i>, often appears as a nonsensical, stretched, or distorted object to the naked eye, but appears in perfect proportion when viewed through the reflection of a cylindrical mirror. • Matthieu Robert-Ortis: A French artist who creates wire sculptures that, when viewed from different angles, transform into entirely different subjects, such as <i>The Revolution of Giraffes</i>, which shifts between the figures of two giraffes and one elephant. • Bernard Pras: Known for using discarded objects and "junk" to create anamorphic installations, which, from a specific viewpoint, form a coherent, recognisable image. Techniques and Outcomes <ul style="list-style-type: none"> • Forced Perspective: The viewer must occupy a specific, "sweet spot" in space to "unlock" the hidden image. • Disguised Meaning: Historically, this technique was used to hide politically or religiously sensitive images, allowing them to be viewed only by those who knew where to stand. See: anamorphosis (A), anamorphic perspective, perspective shift, perceptual art.

TERM	DEFINITION
Anamorphosis (A) General	Anamorphosis is an optical illusion whereby an image appears wholly distorted when seen from the usual vantage point, but appears normal when viewed from a specific angle (perspective anamorphosis), or indirectly in a mirror (mirror anamorphosis). See: anamorphic perspective, perspective distortion, anamorphic lens.
Anamorphosis (B)	Anamorphosis is a violent distortion in perspective, from too near a point of view, and from injudicious altitude or situation of the object, but it is perfectly true according to the laws of perspective.
Anamorphosis (C) - Large scale	Synonym for: Anamorphic perspective illusion. See work of: David Chelsea in his book: Perspective in Action, 2017. See: cabinet of wonder.
Anamorphosis (D) - Street-Painting	Synonym for: Anamorphic perspective illusion as painted in a large scale onto a building. See work of: David Chelsea in his book: Extreme Perspective, 2011.
Anamorphosis (E) - Table Top	Synonym and method for producing an anamorphic drawing (table top method). The table top method refers to a -D optical illusion created on a 2-D surface, such as paper or a tabletop, which appears distorted to the naked eye but becomes three-dimensional and properly proportioned when viewed from a specific, often severe, angle.
Anatomical Perspective Human body	Refers to capturing/making/viewing/exploring perspective images/views of the human body, and may include visualisation of internal structures. Can be in the form of artistic images, or New Media body scans projected onto computer displays, etc. See: Leonardo da Vinci and anatomical perspective.
Ancient / Antique Perspective Art / Drawing Optical/Perspectival Foreshortening Central and Linear Perspective Graphical Perspective	Ancient drawings/paintings tend to be shown in profile and often ignore perspective phenomena such as aspect perspective, diminution of size, degradation of form (shape), vanishing points, etc. Some rare ancient Egyptian/Mexican paintings do show optical/perspectival foreshortening (2) . Sometimes the term is used as a synonym for axial (pseudo) perspective or fishbone/herringbone perspective in which the apparent spatial scene is arranged around a vertical axis with multiple 'stacked' vanishing points. Optical or pure perspectival foreshortening (2) is where the diminution of projected size (in the depth dimension) is dependent on distance, as recognised by the ancients who were not familiar with axonometric or aspect foreshortening that is inevitable when a feature is oblique to the picture plane. In their art, therefore, there is no perspective (of this aspect kind), and it is believed that they did not discover a true or realistic one-point linear perspective method as a result. See: Foreshortening (1, 2), perspectival foreshortening, aspect foreshortening, axonometric foreshortening, central and linear perspective, one-point perspective. See book: Principles of Egyptian Art by Heinrich Schafer (1974). See book: Perspective in Greek and Roman Art by Richter, G.M.A. (1970). See book: Perspective in the Visual Culture of Classical Antiquity by Rocco Sinisgalli (2012).
Ancient Babylonians	Scholars generally agree that the earliest form of writing (symbolic perspective) appeared almost 5,500 years ago in Mesopotamia. The earliest household clocks known are the sundials (1500 BC) in Ancient Egypt, and ancient Babylonian Astronomy. Named the Imago Mundi Babylonian map, this is the oldest known world map, from 6th C. BC Babylonia.
Ancient China Art / Drawing Camera Obscura Armillary Sphere Magnetic Compass	The earliest known written account of a camera obscura was provided by a Chinese philosopher named Mo-tzu (or Mozi) in 400 BC. He noted that light from an illuminated object that passed through a pinhole into a dark room created an inverted image of the original object. Also, early Armillary Spheres were seen here. Being a model of objects in the sky, consisting of a spherical framework of rings, centred on Earth or the Sun, that represent lines of celestial longitude and latitude, plus other astronomically important features, such as the ecliptic. The compass was also invented in China during the Han Dynasty between the 2nd C. BC and 1st C. AD where it was called the "south-governor" or "South Pointing Fish" (sīnán 司南). The magnetic compass was not, at first, used for navigation, but for geomancy and fortune-telling by the Chinese.
Ancient Greece, Rome, Egypt Art / Drawing Linear Perspective Graphical Perspective Orrery Quadrant	The question of whether linear perspective was known in Antiquity remains a matter of debate. Greco-Roman efforts were linked with scenography (skaenographia). This resulted in a sense of depth usually through convergence along an axis of points (fish-bone perspective) and occasionally towards a central vanishing point. However, no study of examples reveals the single vanishing point of linear perspective. Unfortunately, many classicists use the term perspective very loosely to refer to a sense of depth, with no interest in whether a vanishing point, a distance point, or other technicalities were involved. An Ancient Greek hand-powered orrery, perhaps the oldest example of an analogue computer, was used to predict astronomical positions and eclipses decades in advance. In ancient Egypt, a quadrant was used to measure angles up to 90°. Different versions could be used to calculate longitude, latitude, and time of day, etc. See books: On the Rationalisation of Sight (1988) and Art and Geometry (1946) by William M. Ivins.

TERM	DEFINITION
<p>Ancient Greek Perspective Representation Phenomena Callipers Pseudo perspective Semi-scientific perspective</p>	<p>The ancient Greeks developed the first systematic attempts at realistic depiction of depth on a flat 2-D surface; employing perspective phenomena such as aspect perspective (non-scientific type and hence non-systematically applied), recession (size diminution), diminution and degradation of form, foreshortening (non-scientific perspectival foreshortening sometimes used but not true aspect foreshortening), vanishing points, etc. However, it is believed they failed to develop/understand/apply the basic principles of linear perspective, that all the objects must be viewed from one point-of-sight, and orthogonal lines converge to one vanishing point, etc. In terms of instruments, the earliest calliper has been found in the Greek Giglio wreck near the Italian coast. Many types of callipers permit reading out a measurement on a ruled scale, or a dial. Some callipers can be as simple as a compass with inward or outward-facing points, but no scale.</p>
<p>Ancient India Theory of Light Graphical Perspective</p>	<p>Theory of Light In Ancient India, from around the 6th–5th C. BC, Indian people developed theories on light. According to the Samkhya school, light is one of the five fundamental “subtle” elements (tanmatra) out of which emerge the gross elements.</p> <p>Graphical Perspective Graphical perspective in ancient India was characterised by a unique approach that prioritised spiritual, emotional, and narrative depth over the strict linear, geometric perspective developed in the Western Renaissance. Instead of relying on the single, fixed central vanishing point (of one-point linear perspective) to create a 3-D illusion, Indian art traditionally utilised “vertical perspective,” hierarchical scaling, and conceptual, symbolic representations to organise space.</p> <p>Aspects of graphical perspective in ancient India</p> <ul style="list-style-type: none"> • Vertical Perspective and Hierarchy: In early Indian art (e.g., cave paintings at Ajanta), perspective was often rendered vertically, with figures or objects higher up on the picture plane understood to be farther away. Furthermore, the size of figures was often determined by their spiritual or social significance rather than their distance from the viewer. • Symbolic and Narrative Focus: Indian aesthetics prioritised <i>rasa</i> (emotional essence) and <i>bhava</i> (mood). Artists avoided strict linear or convergent perspective to ensure the narrative or divine, symbolic meaning was not lost, for instance, by reducing the size of a deity. • Three-Quarter View: In traditional Indian painting and manuscript illustration, figures were often shown in three-quarter view. • Architectural Layouts and Geometry: Architecture was highly geometric, employing grid-based, and symmetrical planning, often using a cosmic diagram to organise depicted space. • "Planar" Approach: Instead of a single viewpoint, space was often presented in distinct planes (foreground, middle, background), allowing for a narrative to unfold across the scene.
<p>Ancient Roman Perspective Phenomena</p>	<p>Similar to Ancient Greek perspective, this type of perspective exhibits some perspective phenomena, including sometimes optical or perspectival foreshortening (Type: 2), and even vanishing points; however, the images do not exhibit the single vanishing point of linear perspective (for parallel orthogonal lines existing in object space) and so the depicted space is not unified or systematic, in a modern sense.</p>
<p>Anderson, Kristi</p>	<p>Author of classic monograph on linear perspective "The Geometry of An Art" (2007).</p>
<p>Andotrope, 360-Degree Identical Views of 2-D Object << NEW / REFINED Term >> Swept-plane display Omnidirectional Display 360-degree display Billboarding Holographic Video Instrument Perspective Visual Perspective (2nd Type)</p>	<p>Type of modern zoetrope or omni-directional display invented by Mike Andos, whereby he mounts two iPhone displays back to back, each showing an identical video that is synchronised in time (playing the same video sections at identical times). Next, he mounts the phones vertically and also mounts an obscuring tube over both phones, but the tube has two vertical slits (each operating as an optical limiter) and each one is mounted directly in front of the separate phone screens. Next, we simply spin the device, and the whole cylinder rotates at high speed (up to 1200 RPM), producing an effective 40 frames-per-second moving image. Both tablets synchronise their output, effectively doubling the frame rate by displaying two images per rotation. As the mechanism rotates, your view through the slits sweeps across the displays, ensuring that everyone, regardless of direction, ends up with a view of the full screen. The result is a flat or 2-D moving image that can be seen in the same aspect or appears identical from every fixed viewing direction, but as seen from omnidirectional viewpoints or multiple station points, that is the 2-D image looks identical in perspective projectional terms from a full 360-degree point-of-view. This device uses a principle similar to the persistence of vision effect, whereby you perceive a single stable but moving image. You can say that this is a type of 3-D display that presents an unchanged 2-D image perspective projection from all directions. Another way of describing such a 3-D/2-D perspective is that it produces 360-degree identical views of a flat or 2-D object or scene. An Andotrope provides an omnidirectional, bill-boarding holographic video to multiple simultaneous viewers in all directions. See also: Zoetrope, 3-D/2-D Perspective, omnidirectional display, swept-plane display.</p>

TERM	DEFINITION
Angle	The figure formed by two intersecting lines or planes at one point. The point at which two or more lines meet; a vertex. The magnitude of an angle between two lines is measured in terms of rotation about the point of intersection required to bring one line into correspondence with the other (measured in degrees/arc-seconds, etc).
Angle - Dihedral	A dihedral angle is the angle between two intersecting planes or half-planes, measured in a third plane perpendicular to their common line of intersection (edge). It's crucial in geometry for defining shapes, in chemistry (as torsion angles) for molecular conformations (like protein folding), and in aviation for wing stability (dihedral effect).
Angle Axiom	Refers to visual or retinal perspective, specifically that the eye makes size/distance judgements based on an angle distance axiom. See: angle perspective (1), visual perspective (2nd type), central/linear perspective, perspective of lateral distortion (1, 2, 3).
Angle of Inclination	Synonym for: Inclination of a line or plane.
Angle of View (1) Direction of Vision / Projection Visual Perspective (2nd type) Linear Perspective	Angle of View (1): Direction of Vision Synonym for Line of Sight (preferred term) All types of single-view, unified, or technical/systematic perspective methods/systems involve looking-at/observing/representing a spatial scene/object as seen from a specific viewpoint (eye / station point) and using a fixed direction of vision, the latter being an optical/geometric projection made along a fixed line-of-sight or optical axis, and (perhaps) as seen/projected relative to an object's preferred viewing direction or front elevation. Relates to both visual perspective (2nd type) and a linear perspective construction. Synonyms: Angle of View (1), Angle of Vision (1), Axis Line, Axis of Cone of Vision, Axis of Pyramid Of Vision, Axis of Vision, Axis of Visual Pyramid, Central Axis, Central Axis of Vision, Central Ray, Central Visual Ray, Centre Line, Centre Line of Vision, Centre of Vision (2), Direct Line of Sight, Direct Line, Direct Line of Vision, Direction of Gaze, Direction of Projection, Direction of Vision, Line of Direction, Line of Projection, Line of Sight, Line of Vision (1), Looking Angle, Observation Angle, Optical Axis, Perspective Axis, Principle Angle, Projection Angle, Sight Line, Viewing Angle (1), Visual Axis, Visual Ray (principle), Visual Axis, Visual Direction, Alignment Line (2).
Angle of View (2) Field of View Visual Perspective (2nd type) Linear Perspective	Angle of View (2): Field of View (preferred term) — [See also: Visual Ray (2)] Synonym for the visual field or the total angular field captured/represented/displayed in a perspective image/view of a spatial scene. Relates to both visual perspective (2nd type) and a linear perspective construction. Synonyms: Angle of View (2), Angle of Vision (2), Area of Vision (A,B), Centre of Interest, Cone of Vision, Cone of Visual Rays, Field of View, Field of Vision (A), Pyramid of Vision, Pyramid of Sight, Viewing Angle (B: 2), Visual Cone, Visual Field, Visual Pyramid, Visual Ray (2).
Angle of Vision - Choice of during painting construction, and effect(s) on painting observation Angle of Vision (2) Distance Point Visual Perspective (2nd type) Linear Perspective	In books on perspective, we are told that an artist, whilst making the drawing, should set the Angle of Vision (2) or Angle of View (2) to 60 degrees, so that the distance to the point of view is rather less than the length or height of the picture. Remember that the distance-point is not only the point from which we are supposed to make a tracing on an imaginary picture plane, but also (in theory) the point in front of the canvas from which the picture is to be viewed; both station points should coincide for the perspective to be seen correctly. However, an angle of 60 degrees for the visual cone seems ridiculous, since we would be so close to the canvas that we can almost touch it with our noses before we can see the perspective properly. As a result, the French recommend an angle of 28 degrees, so that the distance point is twice the length of the picture, which is far more agreeable for the painting spectator. If the artist is to make a painting of a domestic scene in a small room, it is a mistake to make our distance-point too far off, as it would exaggerate the size of the room.
Angle of Vision (1) Direction of Vision / Projection Visual Perspective (2nd type) Linear Perspective	Angle of Vision (1): Direction of Vision Synonym for Line of Sight (preferred term) Relates to both visual perspective (2nd type) and a linear perspective construction. Synonyms: Angle of View (1), Angle of Vision (1), Axis Line, Axis of Cone of Vision, Axis of Pyramid Of Vision, Axis of Vision, Axis of Visual Pyramid, Central Axis, Central Axis of Vision, Central Ray, Central Visual Ray, Centre Line, Centre Line of Vision, Centre of Vision (2), Direct Line of Sight, Direct Line, Direct Line of Vision, Direction of Gaze, Direction of Projection, Direction of Vision, Line of Direction, Line of Projection, Line of Sight, Line of Vision (1), Looking Angle, Observation Angle, Optical Axis, Perspective Axis, Principle Angle, Projection Angle, Sight Line, Viewing Angle (1), Visual Axis, Visual Ray (principle), Visual Axis, Visual Direction, Alignment Line (2).

TERM	DEFINITION
<p>Angle of Vision (2) Field of View Visual Perspective (2nd type) Linear Perspective</p>	<p>Angle of Vision (2): Field of View (preferred term) — [See also: Visual Ray (2)]</p> <p>Limit of Clear Vision</p> <p>General term for the total angular field captured/represented/displayed in a perspective image/view of a spatial scene. Can be measured, or be different, in vertical (Y) or horizontal (X) directions for a particular perspective representation method, or perspective image capture, or image projection/displayed by an optical instrument. The angle subtended at the eye by visual rays from the object/scenes edge or outer boundary. The limit of the divergence of rays in any direction is what the eye can cover comfortably. It will be found that, with the head held in one position, one eye can see objects along rays making 45 degrees with the line of sight, covering both height and width. However, a small angle of around 30 degrees is commonly used as the limit for perspective views - in other words, the visual cone is assumed to have a maximum total included angle of 60 degrees.</p> <p>Synonyms: Angle of View (2), Angle of Vision (2), Area of Vision (A,B), Centre of Interest, Cone of Vision, Cone of Visual Rays, Field of View, Field of Vision (A), Pyramid of Vision, Pyramid of Sight, Viewing Angle (B: 2), Visual Cone, Visual Field, Visual Pyramid, Visual Ray (2).</p>
<p>Angle Perspective (1) Eye Visual Perspective (2nd type) Angle based distance axiom</p>	<p>Refers to visual or retinal perspective, specifically that the eye makes size/distance judgements based on an angle distance axiom. Lateral or vertical distortion in size (relative to linear perspective) occurs for objects located some distance laterally/vertically from the central axis of vision (horizontal or vertical lateral distortion). This happens because images are projected by a spherical eyeball onto a curved retina, whereby the eye sees identically sized objects at increasing lateral distances as increasingly smaller, and because the eye measures angles rather than images projected onto a flat picture plane, as in linear perspective.</p> <p>See: visual perspective (2nd type), central/linear perspective, perspective of lateral distortion (1, 2, 3).</p>
<p>Angle Perspective (2), Aspect Foreshortening Visual Perspective (2nd type) Linear Perspective Parallel Perspective</p>	<p>Another name for Aspect Perspective, or Aspect of Form Perspective</p> <p>Perspective image that exhibits those perspective phenomena relating to the apparent degradation of form (projected shape changes due to aspect, viewing angle, or projection angle). This effect is also named Aspect Foreshortening (angle or projection-based): object features positioned along, and tilted with respect to, the viewing direction are uniformly contracted in apparent length (irrespective of relative distance), and experience proportional perspective shape distortions accordingly (e.g., object parts becoming equally contracted in length along depth direction). Whilst being patently a purely parallel-perspective phenomenon, this aspect foreshortening form may, or can, contribute to the overall composite foreshortening seen in a typical linear-perspective view/image.</p> <p>See: aspect, parallel perspective, linear perspective, foreshortening (1, 2).</p>
<p>Angular Colour Perspective</p>	<p>A change in apparent colour for an original surface that is angled relative to one that is parallel with the picture plane. This effect can be related to aspect foreshortening (1) whereby a colour change occurs due to the projection angle. See: aspect, aerial and colour perspective, foreshortening (1).</p>
<p>Angular Contrast Reduction Perspective</p>	<p>A reduction in apparent contrast/brightness for an original surface that is angled relative to one that is parallel with the picture plane. This effect can be related to aspect foreshortening (1) whereby contrast reduction occurs due to the projection angle. See: aspect, contrast perspective, foreshortening (1).</p>
<p>Angular Perspective (1, 2) Non-Central perspective Non-Frontal Perspective Linear Perspective Parallel Perspective</p>	<p>1. Two-point linear perspective: angular perspective (1): Synonym for oblique angle perspective (1). Angular perspective (first type) is a subcategory of linear perspective and is identical to two-point perspective. When the horizontal lines at the front and back of a building both converge to vanishing points, left and right, terminating at the horizon, this is called angular perspective (1).</p> <p>2. Non-central perspective: angular perspective (2), oblique angle perspective (2).</p> <p>Angular perspective (second type) refers to all forms of non-central perspective that use an off-axis viewing angle or project the scene from an oblique vantage point; and includes parallel projections of both the orthographic and oblique types.</p>
<p>Angular Perspective (3) Middle-Distance Perspective</p>	<p>3. Angular Perspective: steep angular views of objects. Synonym for baroque perspective (A, B:2, C). Synonym for: Illusionism and Trompe l'Oeil, deep recession, accelerated foreshortenings.</p> <p>Disposes in a proximate or intermediary distance an entanglement of planes, with accentuated chiaroscuro, in a harmonic or discordant vectoriality (directions). Even when it signals a distanced lighted region in one of the superior corners of the artwork, this perspective is quite involved in an accumulation of elements in the foreground and strengthens their dimension, colour densities, sudden foreshortenings. It produces a 'kinesthetic excess; in the proxemics in relation to the treatment of elements in the medium or background levels. Similar to cubism and cubist perspective. Defined as an Intermediary or Middle-Distance Perspective by Fernande Saint-Martin.</p>
<p>Angular Picture Plane</p>	<p>Type of perspective projection in which the picture plane is placed at an angle, or is non-planar or not-normal, relative to the central visual axis, optic axis, or line-of-sight, of the projection viewpoint.</p>

TERM	DEFINITION
<p>Animated Perspective (1, 2, 3)</p> <p>Motion Perspective Cinema Perspective</p> <p>Photographic Perspective</p> <p>Computer Modelling, Wire-Frame Perspective, Ray Tracing</p> <p>Persistence of Vision</p>	<p>1. Hand-drawn animations</p> <p>Type of animated perspective in which visual images of human/animal characters, etc., are sketched (by hand one at a time) onto single drawing/movie frames, whilst being changed slightly between frames to represent movement, and then displayed in rapid succession to evoke a real-time impression of movement.</p> <p>2. Computer-generated images</p> <p>Type of animated perspective in which visual images of human/animal characters, etc., are created by, and within, a computer model (often individually one at a time), with slight changes between frames to represent movement, and then these same images are transferred onto movie frames, which are then displayed in rapid succession to evoke a real-time impression of movement.</p> <p>3. Stop motion animation</p> <p>Type of animated perspective in which individual photographic snapshots of physical models of human/animal characters are taken one at a time with slight changes between frames to represent movement, etc., which are then transferred onto movie frames displayed in rapid succession to evoke a a real-time impression of movement.</p> <p>See: motion perspective, persistence of vision principle/effect, cinematograph, cinema.</p>
<p>Animated Photograph</p> <p>Animation Cinemagraph Cinematograph</p>	<p>An animated photograph, also known as a cinemagraph, is a still image that has been animated to create the illusion of movement. The term "cinemagraph" was coined in 1917 by Kevin Burg and Jamie Beck, who used the technique to animate their fashion and news photographs. Their method involved printing a photograph on a celluloid base and mounting it in front of a ruled screen. Animation is a technique that creates the illusion of movement by displaying a sequence of images in quick succession. The human eye only retains an image for 1/10 of a second, so when multiple images appear in quick succession, the brain blends them into a single moving image.</p> <p>See: motion perspective, persistence of vision principle/ effect, cinematograph, cinema.</p>
<p>Animation</p> <p>Cinema / Animated Perspective</p> <p>Persistence of Vision</p> <p>Moving JPEG File Format</p>	<p>Animation is creating the illusion of movement from static images, by rapidly displaying a sequence of drawings, models, or 3-D computer graphics, bringing inanimate objects and characters to life for storytelling, entertainment, and art/science. Related techniques include traditional hand-drawn (cel) animation, computer-generated imagery (CGI) for 2-D/3-D, and stop-motion using physical objects. The core principle is designing key poses (keyframes) and creating smooth "in-between" frames to transition between them, using principles such as timing, spacing, squash & stretch, and follow-through to add realism and personality.</p> <p>See: Graphical perspective, linear perspective, caricature / cartoon perspective, animated photograph, cinema, animated perspective, motion perspective, persistence of vision principle/ effect, cinematograph.</p>
<p>Animation - In-Betweening or Tweening</p>	<p>Inbetweening, or tweening, is a process in animation that involves creating intermediate frames, called inbetweens, between two keyframes. The result is to create the illusion of movement by smoothly transitioning one image into another.</p>
<p>Annunciation</p> <p>First Perspective Painting</p>	<p>In Christianity, the Annunciation refers to the angel Gabriel's announcement to the Virgin Mary of the incarnation of Christ. Vasari claimed that Paolo Uccello's <i>Annunciation</i> was the first painting to use perspective, rather than Masaccio's <i>Trinity</i>, as is often claimed in the twentieth century.</p>
<p>Anoptike</p>	<p>Synonym for worm's eye perspective.</p>
<p>Anthropocene System (Digital)</p>	<p>The anthropocene is used to describe the time during which humans have had a substantial impact on our planet. Whether or not we are in a new geological or global-warming age, we are part of a complex, global system, and the evidence of our impact on it has become clear. The digital anthropocene refers to systems that mirror (combine/interrelate) human impacts on a global scale.</p>
<p>Anthropomorphic Landscape Perspective</p>	<p>Any perspective method/system that produces two simultaneous pictures depicted on one picture plane surface. An example occurred in 17th-century paintings, in which a face was hidden in the landscape.</p>
<p>Anti-Perspective</p> <p>No Recession No Convergence Aspective Non-Perspective Parallel Perspective Chinese / Japanese Perspective</p>	<p>A perspective method/system that rejects central projection in favour of methods that avoid distortions of scale/shape that arise from (a finite) viewpoint location. Employs a spatial image that does not exhibit classic depth-based optical/geometric perspective phenomena, including recession, foreshortening, etc. The Illusionistic space of linear perspective and similar graphical techniques based on naturalistic viewpoint 'distortions' is only one way to depict the three-dimensional world. Anti-perspective refers to any representation technique that rejects the hegemony of central projection (or linear perspective). Parallel perspective, for example, preserves (in scale) the actual measurements of the objects it represents, avoiding the distortions of one-point perspective.</p> <p>Synonyms: aspective, non-perspective, parallel perspective, Chinese perspective.</p>