

Lightness: an attribute based on the extent to which an object is judged to be reflecting a greater or lesser fraction of the incident light.

Hue: an attribute based on the classification of a colour as reddish, yellowish, greenish, bluish or their intermediaries or as having no colour.

Saturation: an attribute based on the extent to which a colour is different from no colour of the same brightness or lightness.

Transparency: an attribute based on the extent to which colours are seen behind or within an object.

Glossiness: an attribute based on the extent to which a surface is different from a matte surface with the same lightness, hue, saturation and transparency.

Not all these attributes occur in every situation. Rather, different combinations of attributes occur in different modes of appearance. The four modes of appearance are as follows.

Aperture mode: this occurs when an object or surface has no definite location in space, as occurs when a surface is viewed through an aperture.

Illuminant mode: this occurs when an object or surface is seen to be emitting light.

Object mode (volume): this occurs when a three-dimensional object has a definite location in space with defined boundaries.

Object mode (surface): this occurs when a two-dimensional surface has a definite location in space with defined boundaries.

Table 2.1 shows which of the attributes can be associated with each mode of appearance. Of particular interest to the perception of lighting is the shift between the attributes of brightness and lightness in different modes of appearance. An object which appears in the self-luminous mode, such as a VDT screen or a light source, is perceived to have a brightness but not a lightness. In this mode of appearance, the concept of reflectance is perceptually meaningless. However, an object that appears in the volume mode, such as a VDT screen or a light source that is turned off, does not have an attribute of brightness but does have a lightness in that its reflectance can be estimated.

Table 2.1 The visual attributes that can occur with each mode of appearance

Attribute	Aperture	Illuminant	Volume	Surface
Brightness	★	★		
Lightness			★	★
Hue	★	★	★	★
Saturation	★	★	★	★
Transparency		★	★	★
Glossiness				★