

Photopic and scotopic vision

Human eyes have developed to detect a small amount of the electromagnetic spectrum; this amount is called the visible light region. This region ranges in wavelengths from about 380nm or 400nm to 700nm or 780nm, which is very small when compared to the entire electromagnetic spectrum. It can also depend on the individual pair of eyes. Light waves are either absorbed or reflected by objects; humans see the mix of reflected colours in the eyes, giving a certain object a specific colour. If light waves did not reflect back, then all colours would be absorbed and we would only see black. If it was opposite, and all colours reflected to our eyes then we would only see white. Every single colour corresponds to a wavelength to which it was assigned to. The longer wavelengths appear on the red side of the range and the shorter wavelengths appear on the blue/violet side of the visible spectrum.

Photopic vision

Photopic vision is the vision of the eye under well-lit conditions, normally usual daylight light intensity. It allows colour perception which is mediated by cone cells. Cone cells have a higher visual acuity as well as providing the eye's colour sensitivity. There are three types of cone cells to sense light for three bands of colour. Out of the six to seven million cone cells in the eye, 64% would be considered 'red' cones, 32% would be considered 'green' cones and 2% would be 'blue' cones. (Blue cones also have the highest sensitivity).

Scotopic vision

Scotopic vision is the vision of the eye under low light conditions. Cone cells do not function as well as rod cells in low level lighting so scotopic vision happens completely through rod cells, which are most sensitive to wavelengths of light on the electromagnetic spectrum of 498nm, which would be the blue-green bands of colour.

Mesopic vision

Mesopic vision is the type of visions that takes place in intermediate lighting conditions. It is basically a combination of photopic vision and scotopic vision, so both cone cells and rod cells are being used.

Links

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Bibliography

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