Glossary: Visual Impairment

**Accommodation** - the ability of the lens of the eye to vary in thickness, so that a sharper image falls on the retina. To experience its effect try this exercise. Close one eye and, while looking at your finger at arm's length, slowly bring your finger towards your nose. You can feel the tension in your eye as the lens thickens.

**Amblyopia** - where central visual acuity of an apparently healthy eye is reduced because of lack of use for certain visual functions. Often it occurs because the "good eye" is preferred. It is usually associated with squint.

**Aniridia** - absence of the iris which controls the amount of light entering the eye as in a camera's shutter. The learner will be photophobic, therefore it is helpful to use dimmed lights and she may benefit from filtered lenses.

**Binocular coordination** - use of both eyes together so that the separate images from each eye (which are slightly different) are interpreted by the brain as a single image. At its highest form - stereopsis - an impression of depth can be obtained by the brain superimposing two slightly dissimilar pictures of the same objects.

**Binocular parallax** - for any point you fixate, the images on the two eyes must be slightly different. But the two different images still allow us to perceive a stable visual world. Binocular parallax refers to the ability of the eyes to see a solid object and a continuous surface behind that object even though the eyes see two different views.

**Cataract** - lens of the eye is cloudy or completely opaque, the result is a loss of vision for detail. If the cataract is located in the centre of the lens then dim lighting should be used. If on the peripheral part of the lens then it is usually helpful to have brighter lighting.

**Coloboma** - present from birth, a cleft or wedge is missing from the Iris. It is likely that visual field problems will exist. This may affect mobility and scanning such as symbols, pictures or text.

**Contrast** - the way that a foreground (say an object) stands out from its background. Contrast is not a property of visual edges on the retina but of visual edges in space. This is important in allowing us to vary the learner's visual world in order to enhance contrast.

**Contrast sensitivity** - the term is used in a technical sense to refer to the minimal amount of contrast needed to perceive a test pattern. Some writers argue that contrast sensitivity gives a better indication of ability to see the form of objects than does a measure of visual acuity.

**Cortical/cerebral visual impairment (CVI)** - vision is affected by problems in the brain rather than problems with the eye itself. Children with CVI typically exhibit some of the following: very short visual span, processing difficulties, fluctuating visual skills, problems with contrast, colour and crowding, and associated neurological problems eg; motor disabilities. Often the child appears to have better peripheral vision. Use good illumination and high contrast materials.
**Crowding** - vision is sometimes worse when crowded by other information e.g., words on the page too close together or patterns behind an object. Children can be assessed for crowding difficulties.

**Dark adaptation** - refers to the gain in sensitivity as the eye remains in the dark. It is a relatively slow process, taking around 40 minutes to complete. Where the ability of the eyes to adapt to the dark is slower, this is likely to be associated with poorer contrast sensitivity. Should the learner suddenly exhibit poorer dark adaptation than is usual for that learner, you may want to request further examination.

**Diabetes** - this is a major cause of blindness in industrialised countries. Blindness is associated with older people who have diabetes.

**Emmetropia** – the name for the type of eye which correctly focuses light at a point on the retina (with the lens at rest). See also Refractive error.

**Font size, point size** - Fonts refer to the different types of lettering (typography) there are 2 main types serif (letters with tails) and sans serif (letters without tails) the type of font used can change the readability of text. Point size - Typefaces come in a variety of standard sizes, these are often referred to for specifying optimal sizes for large print production. Teachers often refer to optimal sizes for specific children as N18, N24 etc for near vision tasks.

**Glaucoma** - raised pressure within one or both eyes. The cornea or outside surface of the eye clouds and peripheral vision decreases. The learner may be uncomfortable in bright light (photophobia) and if mobile have difficulty with travelling.

**Hypermetropia** - long sightedness. Parallel rays entering the eye come to a focus behind the retina. Note that it does not mean that vision is very good (eyes like an eagle!). It means that the muscle controlling the thickening of the eye (see accommodation) has to continually work when reading and for other close work - the eyes literally do then get tired. See also Refractive error.

**Light adaptation** - is the loss of sensitivity when an eye (or both eyes) has become adapted to the dark. Complete light adaptation is much faster than dark adaptation. Much of the adaptation to light takes place within a second, the remainder requiring only a few minutes.

**Motion parallax** - information at the retina caused by relative movement of objects as the observer moves to the side (or his head moves sideways). Motion parallax varies depending on the distance of the observer from objects. The observer's movement also causes occlusion (covering of one object by another), and as movement changes so too does occlusion. This can give a powerful cue to the distance of objects from the observer.

**Myopia** - short sightedness. Parallel rays entering the eye come to a point in front of the retina. See also Refractive error.

**Nystagmus** - Rapid uncontrollable movement of the eyes, impaired vision for detail, although peripheral vision may be better. Problems in depth perception may result. It is unusual for nystagmus to occur in isolation, usually indicating other difficulties. Experiment to find if there is a stable point; i.e., position of objects in relation to the learner's eyes in which the movements become less obvious.
Occlusion - provides information as to the relative depth of objects. Very helpful when depth cannot be perceived by binocular coordination (or binocular vision)

Optic atrophy - nerve fibres transmitting information from the eye to the brain are affected. Use bright illumination of objects and high contrast of materials.

Optic expansion pattern - the information at the eyes which specifies an approaching object.

Photophobia - when light hurts the eyes and the person keeps her eyes away from bright lights. In extreme forms the person performs best in very low light levels.

Proprioception - sensations from the joints and other sites of the body. These help the individual to sense the positions in space of parts of the body.

Prosopagnosia - a rare condition which describes when faces cannot be recognised even though other visual abilities would suggest that this would be possible.

Refractive error - light coming from a distant object (6 metres or more) enter the eye in parallel. If the object is to be seen clearly, the eye must focus on a point on the retina. This depends on four things:-
- the amount the eye curves;
- the length from the cornea at the front to the retina at the back of the eye;
- the position of the lens inside the eye;
- the state of that lens. The normal eye is emmetropic.

Retina - made up of specialised cells called rods and cones (around 120 million rods and 7 million cones) this acts a bit like the film of a camera. The most sensitive part of the retina is the fovea, which you use for seeing close detail - like reading this page.

Retinitis pigmentosa - where peripheral vision is affected first. There are several different types of RP. With reduced vision in dim light and blurring of images, the condition is often progressive. May be associated with deafness (Usher syndrome), in which case the learner is born deaf and later may become visually impaired.

Retinopathy of prematurity - where the retina is scarred due to immature blood vessels in the eye reacting to changes in oxygen pressure soon after birth. Some learners affected will have residual vision and this will usually be accompanied by short sight (myopia) and a squint may be present. Good illumination and plus lens refraction may be helpful.

Retrolental fibroplasia see retinopathy of prematurity

Saccades - voluntary eye movements, usually quick movements of both eyes simultaneously, used for tasks such as reading or scanning a scene.

Scotoma (pl. scotomata) - a blind spot in one or both eyes, or occurring between the eye and part of the brain which interprets information detected through the eyes.

Size constancy - whenever the perception of object size remains constant even with changes in the object's or observer's position.

Squint (Strabismus) - imbalance of the eye muscles may result in the eyes turning either towards the nose or outward, the latter having sensitivity to bright light. As a result if one eye is straight this takes over, leading to the image from the affected eye being ignored (amblyopia). Often with learners with additional disabilities, one eye does not suppress the other and double vision (diplopia) occurs. This results in difficulties with discriminating form and patterns of distinguishing figure from background and
with depth perception, eye/hand coordination and fine motor skills. Good contrast is important, as well as using good even illumination.

**Stereopsis** - highest form of binocular coordination (see above). Great fun used to be had in Victorian times with the use of Stereoscopes, devices which artificially created slightly different views of the same scene. The same technique is used today in 3-D cinema.

**Usher syndrome** see Retinitis pigmentosa.

**Visual acuity** - the ability of the eyes to see detail. There are a variety of ways of measuring visual acuity.

**Visual field** - is the area that you should be able to see without moving your head or eyes.

**Visual field loss** - where part of the vision is lost, commonly sections of the left or right sides (hemianopia), upper or lower vision or spots called a scotoma. Eg, a child with lower visual field loss will have difficulty navigating down steps.

This Glossary was adapted from *Vision for doing: assessing functional vision of learners who are multiply disabled* by Stuart Aitken and Marianna Buultjens.

http://www.ssc.education.ed.ac.uk/resources/vi&multi/vfdh/vfdfront.html