



GIS MYP Science Department

Grade 9 – The Eye

Name: _____

Key concept

Relationships

Related concepts

Consequences Energy Evidence Form

Global context

Scientific and technical innovation

Statement of inquiry:

Energy can move from place to place in a number of **forms**, **evidence** for which is all around us. The movement of energy often has **consequences** and the **relationship** between the movement of energy and its consequences must be understood if it is to be used for our benefit.

This table shows the main parts of the eye, their structure and function. But the parts are mixed up.

Part	What is it? (Structure)	What does it do? (Function)
Cornea	Transparent, bi-convex, flexible disc behind the iris attached by the suspensory ligaments to the ciliary muscles.	carries impulses from the eye to the brain
Iris	The lining of the back of eye containing two types of photoreceptor cells - rods - sensitive to dim light and black and white - and cones - sensitive to colour. A small area called the fovea in the middle of the retina has many more cones than rods.	contains the light receptors
Lens	Bundle of sensory neurons at back of eye.	refracts light - bends it as it enters the eye
Retina	Front part of the tough outer coat, the sclera. It is convex and transparent.	focuses light onto the retina
Optic nerve	Pigmented - decides the colour of your eyes - so light cannot pass through. Its muscles contract and relax to alter the size of its central hole or pupil.	controls how much light enters the pupil

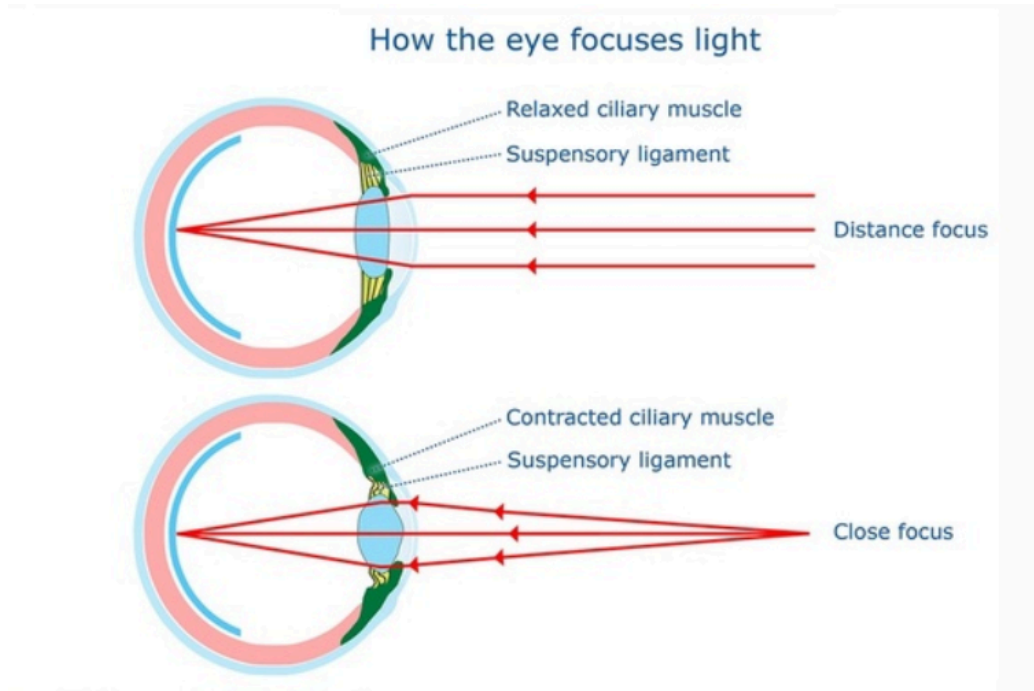
Figure out what they should be and write each section in the correct box below.

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Seeing

As light enters your eye, it is **refracted**, first by the **cornea** and then by the **lens**. It is focused on the **retina**.

Draw rays of light to show **how they are refracted** on the eye diagram below.



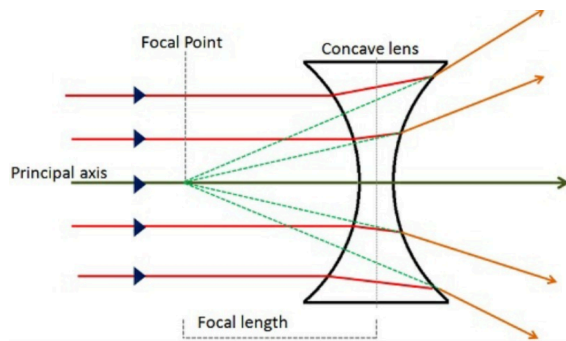
For distant objects the **ciliary** muscles relax and the **suspensory ligaments** pull tight, making the lens pull **tight**– the light doesn't **bend** as much.

For close objects the ciliary muscles **contract** allowing the lens to go **flat**, thus bending the light **more**.

Correcting Vision Defects (<https://www.youtube.com/watch?v=Av1ZiN9P01s>)

1. Myopia

- What is it usually called? nearsightedness
- What is the problem? Light is focussed at a point before the retina so objects far away from the eye aren't focussed.
- What kind of lens can be used to correct the problem? Diverging

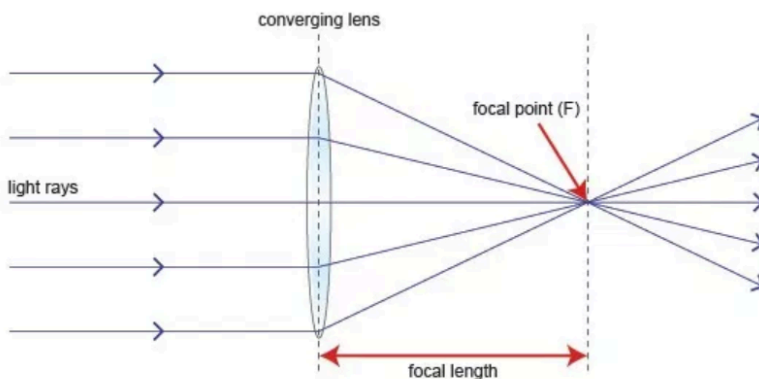


Draw the shape of that lens here.

- Explain how this type of lens helps to correct the problem. **It brings the focal point further back so it is on top of the retina.**

2. Hyperopia

- What is it usually called? farsightedness
- What is the problem? Light is focussed at a point after the retina so objects close to the eye aren't focussed.
- What kind of lens can be used to correct the problem? Converging
- Draw the shape of that lens here.



- Explain how this type of lens helps to correct the problem. **It brings the focal point closer to the lens so it is on top of the retina.**

Lasik – give a brief description of lasik surgery, what it treats and how it works.

For clear vision, the eye's cornea and lens must bend (refract) light rays properly. This allows images to be focused on the retina. Otherwise, the images will be blurry.

This blurriness is referred to as a "refractive error." It is caused by a difference between the shape of the cornea (curvature) and the length of the eye.

LASIK uses an excimer laser (an ultraviolet laser) to remove a thin layer of corneal tissue. This gives the cornea a new shape so that light rays are focused clearly on the retina. LASIK causes the cornea to be thinner. It may correct myopia or hyperopia.