# Parts of the Eye and Their Functions

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# Introduction

Although the human eye is not a very large organ, it plays a very large role in our existence because it serves as our primary “tool” to navigate this world. Because sight is one of the most important among the five senses, to understand its functions, Optometrists have delved into the anatomy of the eye. The eye can be split into two categories, the external eye, and the internal eye.

There are several parts of the external eye,

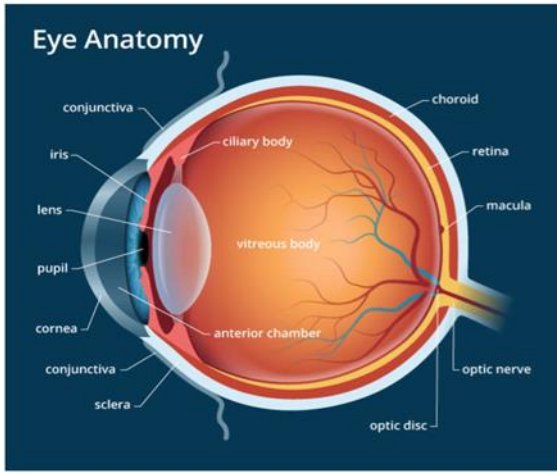
- the upper and lower Lids
- the Pupil
- the Iris
- the Sclera, and more.

The internal eye has multiple parts as well. These are some of the main parts of the internal eye.

- The Retina
- Optic Nerve
- Macula
- Retinal blood vessels
- the vitreous body

This report will briefly inform the reader about the functions of the external and internal parts of the eye:

- Chapter 1 Opening the eye The outermost function of the eyeball
- Chapter 2 The external part of the eyeball The first layer of the eyeball
- Chapter 3 The internal part of the eyeball The inside of the eyeball
- Chapter 4 The back of the eye The last functions of the eyeball




The image above is a brief overview of all the parts of the eye.

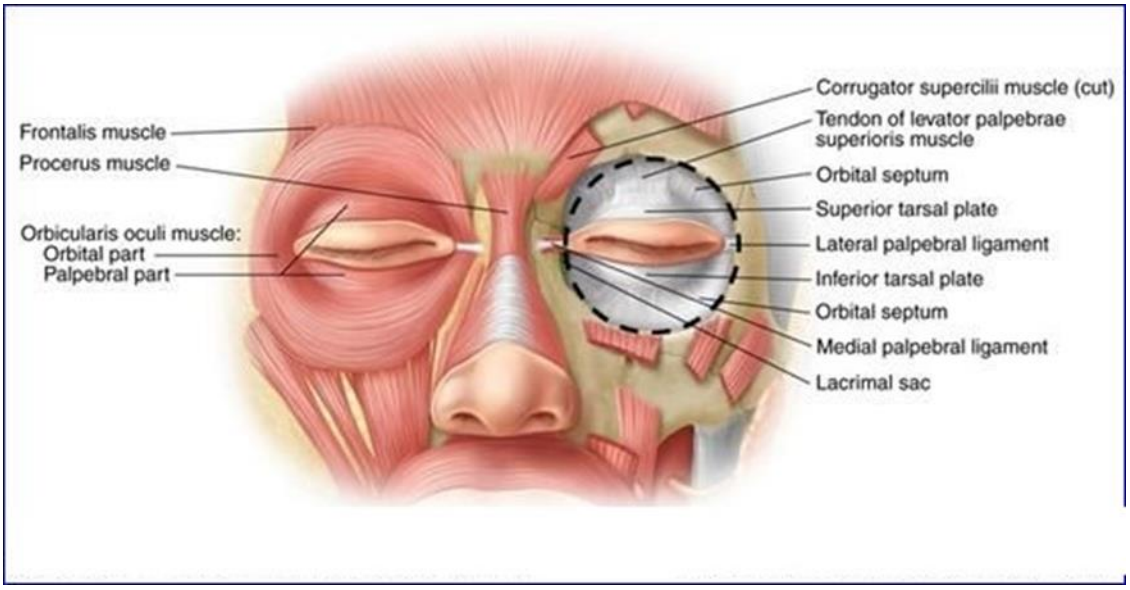
# Chapter 1 Opening the Eye

## The outermost part of the eye

From the moment you blink your eyes open, the eye has already performed countless actions that enable your vision to function optimally. The eyelids are the part of the eye that perform first. They are thin skin tissue that folds over the eye that is composed of blood and no inner fat, but a muscle called the orbicularis oculi.

The orbicularis oculi have three parts:

- Palpebral
- Lacrimal
- orbital




The image above is a brief overview of the outermost part of the eye.

## The Eyelids

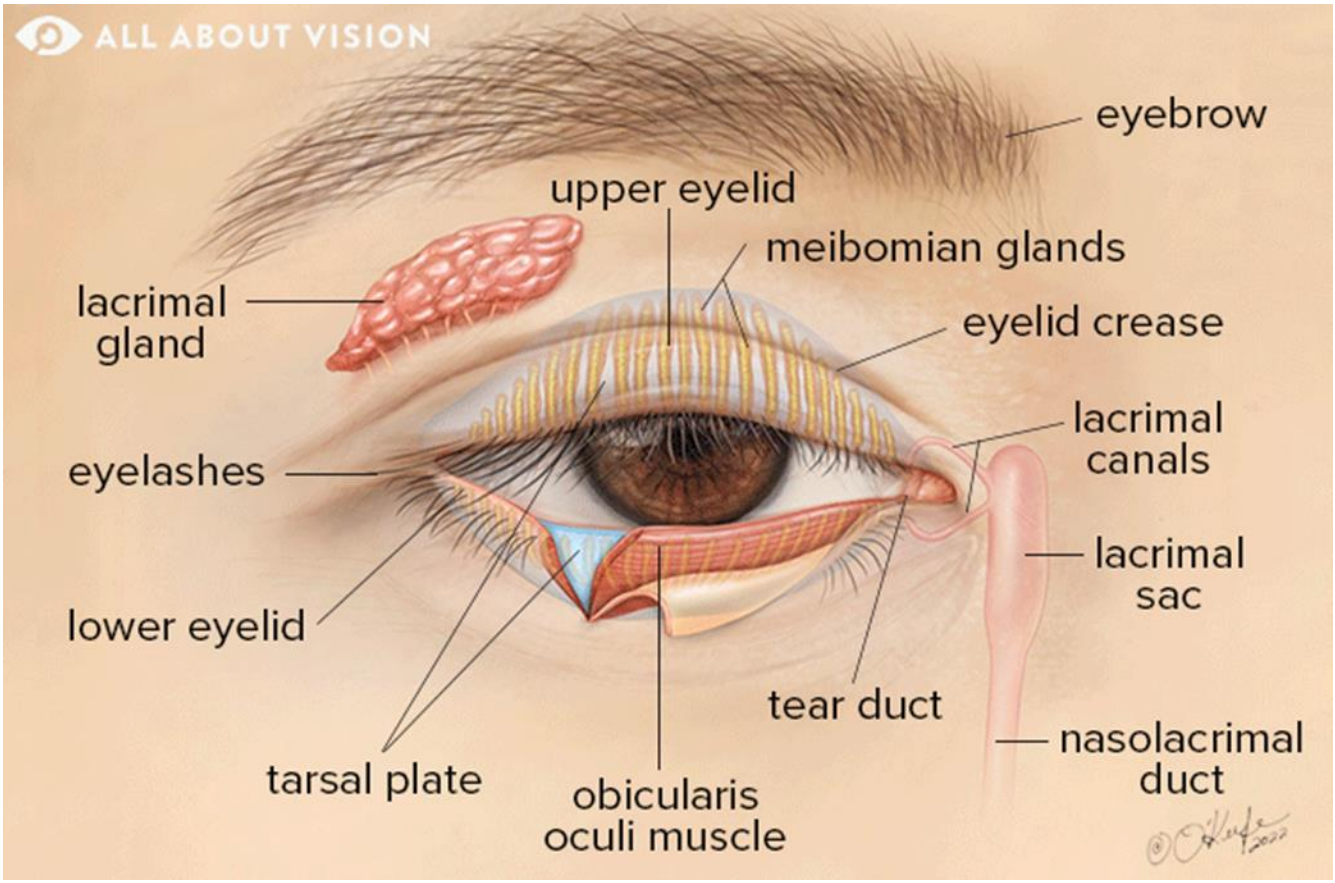
The muscle that closes the eye softly is called **the palpebral** part of the eye. **The lacrimal** part drains the tears, and **the orbital** part tightly closes the eyelids. The main function of the eyelids is to protect the eye from physical and chemical debris. The blinking of the eyelid's functions like windshield wipers, they are constantly opening and closing to keep foreign entities out. It also maintains a layer of lubricant, and tears, to keep infection out and clear your sight.

## The Tears

Tears are composed of lipid and aqueous fluids. The lipid is an oily substance that comes from the meibomian gland at the lash line, they prevent the aqueous layer from evaporating. Tears are mostly made of the aqueous layer which consists of protein and nutrients that are distributed to the cornea. The aqueous layer also heals the eye with its fluids which are distributed by the mucus mucin nerve. This is also a layer in the tear that is composed of high molecular weight glycoproteins called mucins, it spreads the tear lubricant evenly throughout the eye.

## The Eyelashes

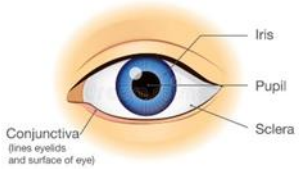
The lashes are connected to the brain to signal blinking for protection. They have moll and seis glands. These are the sweat glands that keep the lashes oily to capture debris at the outer edge of the eye.




The image above shows the glands and the lashes.

# Chapter 2 The External Part of the Eyeball

The external part of the eyeball is made up of the conjunctiva, sclera, cornea, iris, and pupil. These are the second outermost functions of the eyeball.




The image above shows the basic parts of the external eyeball.

## The Conjunctiva

**The conjunctiva** is the second part of the eye to respond, it is a clear membrane that covers part of the interior eyelid and the part of the surface eyeball. The interior conjunctiva is called the palpebral or tarsal conjunctiva, it is on the inside of the top and bottom lid. The bulbar conjunctiva separates the cornea and the sclera, it doesn't cover the cornea. The conjunctiva keeps the eye moist and allows the eyelids to blink smoothly without irritation and keeps infections and microorganisms out. It is also made of blood vessels that distribute nutrients to the eyeball and lids.

## The Sclera

Under the conjunctiva is **the sclera**. The sclera is the whites of the eye. It is a strong and flexible wall that continues from the cornea. It is made of fibers and connects to the optic nerve in the back of the eye. The sclera has three parts, episcleral, sclera proper, and lamina fusca. The episcleral is beneath the conjunctiva, the sclera proper is the pigmented white part, and the lamina fusca is the backmost fibrous part of the eye. The sclera holds the shape of the eye and protects the optic nerve.

## The Cornea

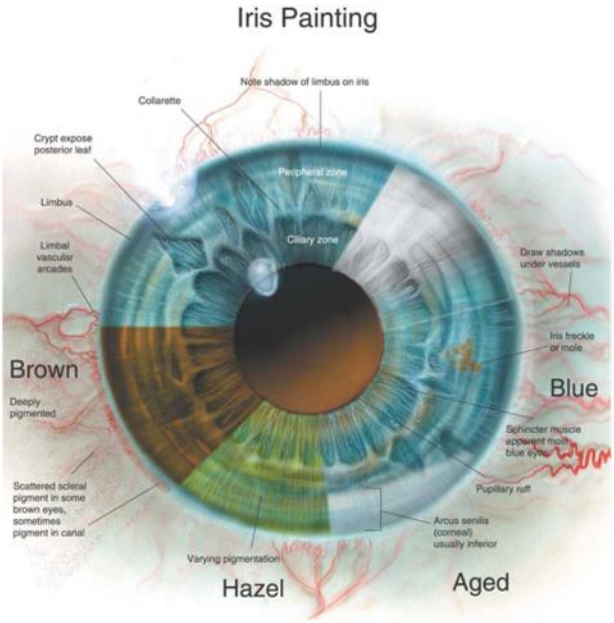
For humans, light is required to see. **The Cornea** is the first part of the eye to respond to light. The cornea is the clear domed surface in front of the eye, it has a high concentration of nerve fibers making it sensitive to foreign bodies, cold air, and chemicals. That is why eyes sometimes tear up in response to cold air. Between the cornea and the iris is the anterior chamber, a space filled with clear fluid that is called aqueous humor. This is a plasma-like fluid that consists of mostly water and little nutrients, proteins, vitamins, and sugars. It serves as drainage for the eye and keeps the cornea inflated and nourished. This fluid is excreted from the ciliary body, a muscle located around the lens.

## The Pupil

The cornea then refracts the light to **the pupil**. The pupil is the dark center of the eye. Inside the pupil is the sphincter muscle which is used to change the size of the light passing through. In the pupil, there are Parasympathetic nerve fibers, a muscle that constricts the pupil. There are also sympathetic nerve fibers that control dilation. The pupil also focuses on objects depending on the distance, it dilates for far objects and constricts for close ones. The saliency of the pupil is stimulated by the mental effort exerted, and it responds by dilating and contracting.

## The Iris

Around the pupil is the colored muscle tissue of the eye, the iris. Its pigmentation varies based on the amount of melanin a person has. The iris has two parts, the circular and radial muscles. They dilate and contract to the amount of light passing through. When the iris contracts, it is letting less light pass; when it expands it allows for more light to pass.

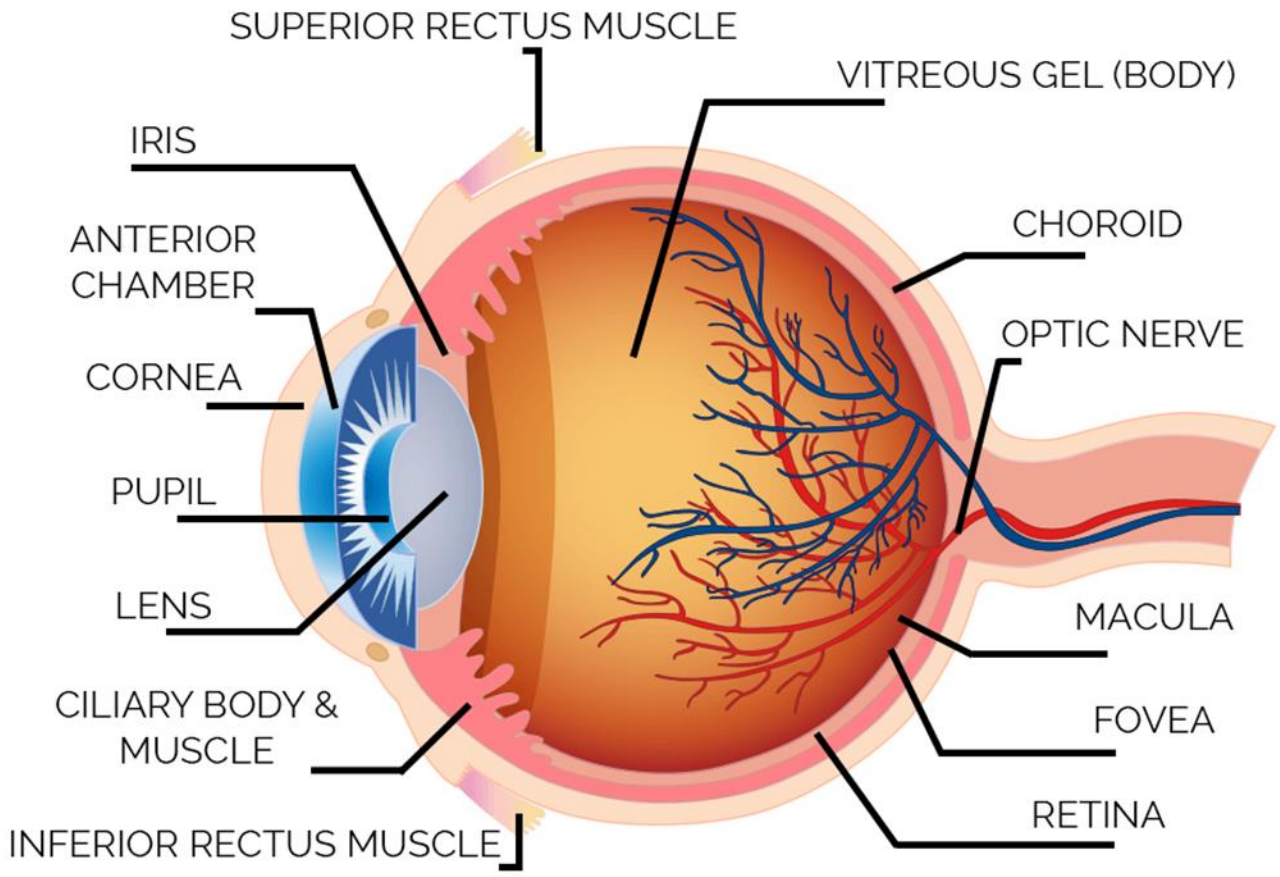



The image above is a detailed image about the pigmentation of the Iris and the meanings.

# Chapter 3 The Interior Part of the Eye

The interior part of the eye is made up of,

- the lens
- the ciliary body
- the vitreous chamber (vitreous humour)

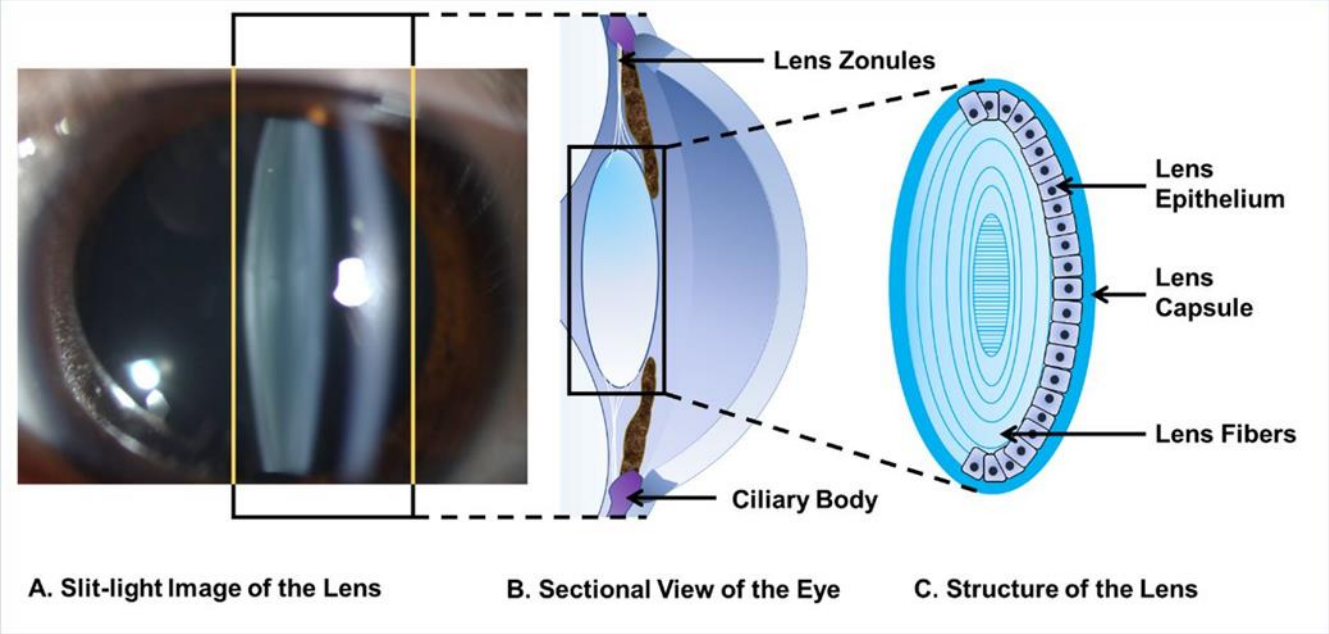



The image above is an overview of the interior of the eyeball.

## The Lens

After the light passes through the pupil, it is sent to **the lens**. The lens is a transparent layer behind the iris. It consists of three parts. The lens capsule, the lens epithelium, and the lens fibers.

- The **lens capsule** is the clear exterior of the lens.
- **Lens fibers** are clear longitudinal cells making up most of the lens.
- **The lens epithelium** creates fibers for the continuous growth of the lens, it is located in between fibers and capsule for stable function.




The image above shows the parts of the lens in different structures.

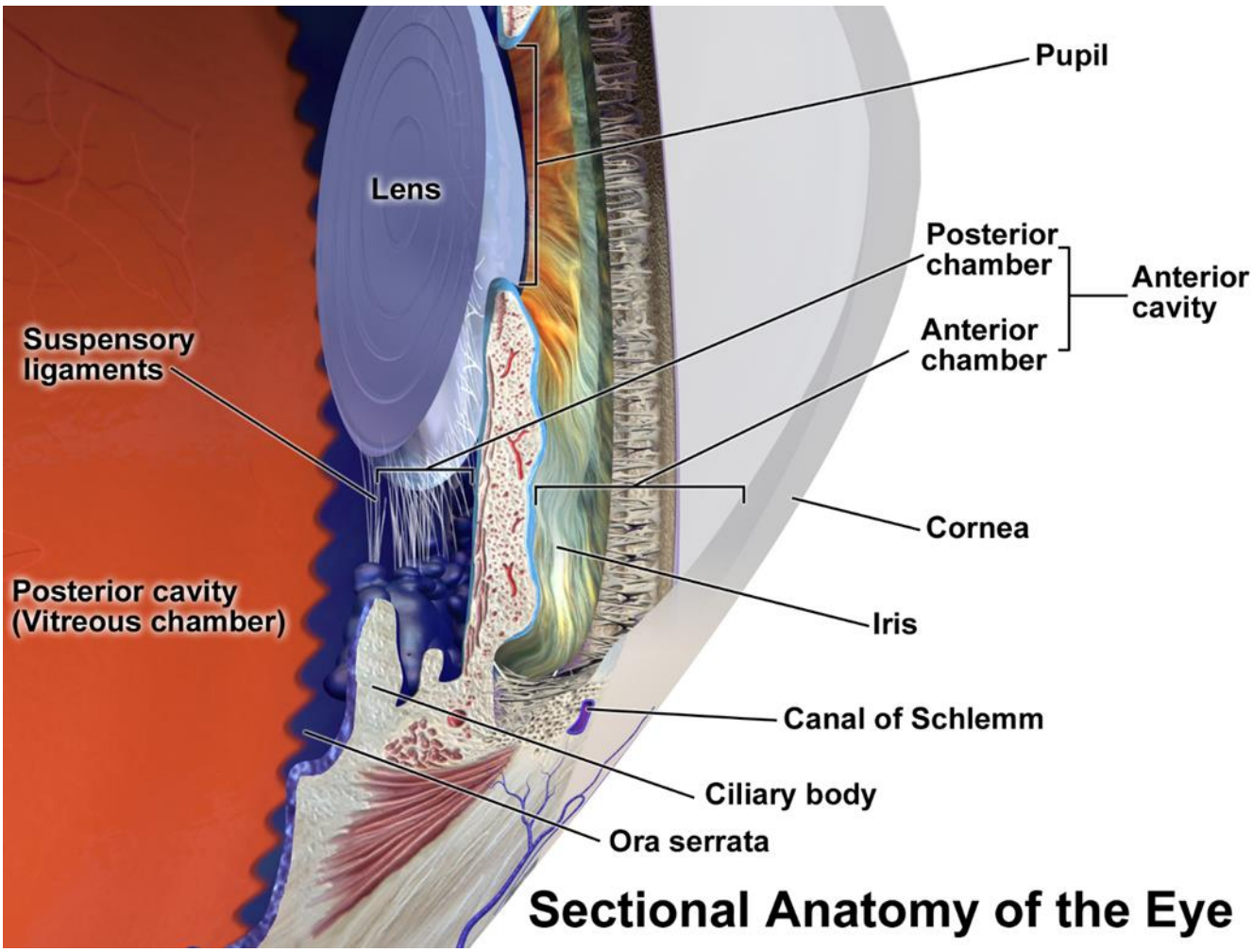
## The Ciliary Body

The lens is surrounded by **the ciliary body** which as mentioned above secretes aqueous humor, it also changes the shape and thickness of the lens when it focuses on its intended object.

This is controlled by **the ciliary muscle**. Optometrists call this process “accommodation”. This area is called the **posterior chamber**, it is located behind the iris in front of the lens.

It also includes **t** which functions as a barrier between blood and the anterior part of the eye by excreting aqueous humor fluids.

All these components work together to focus the amount of light of the object depending on its distance to create a clearer image to be passed to the retina.



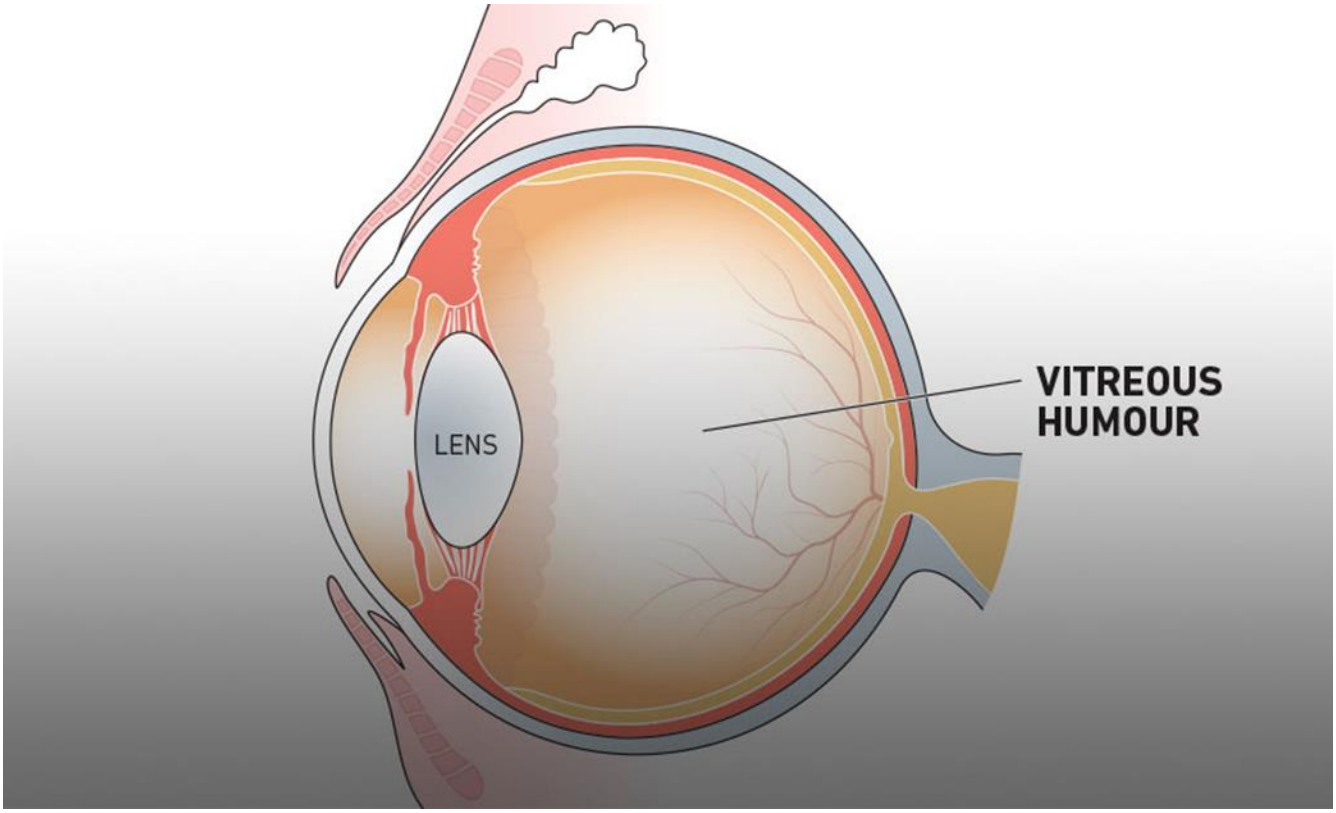

The image above shows the side view of the different components of the internal part of the eye.

## The Vitreous Chamber

However, light doesn't immediately go to the retina, it passes the space between the lens and the retina called **the vitreous chamber**.

The vitreous chamber makes up eighty percent of the eye, it is made up of gelatinous fluid consisting of water and one percent of proteins, collagen, sugars, and salts.

The vitreous chamber holds the retina in place and maintains the shape of the eye, it also serves as a shock absorber to the eye.

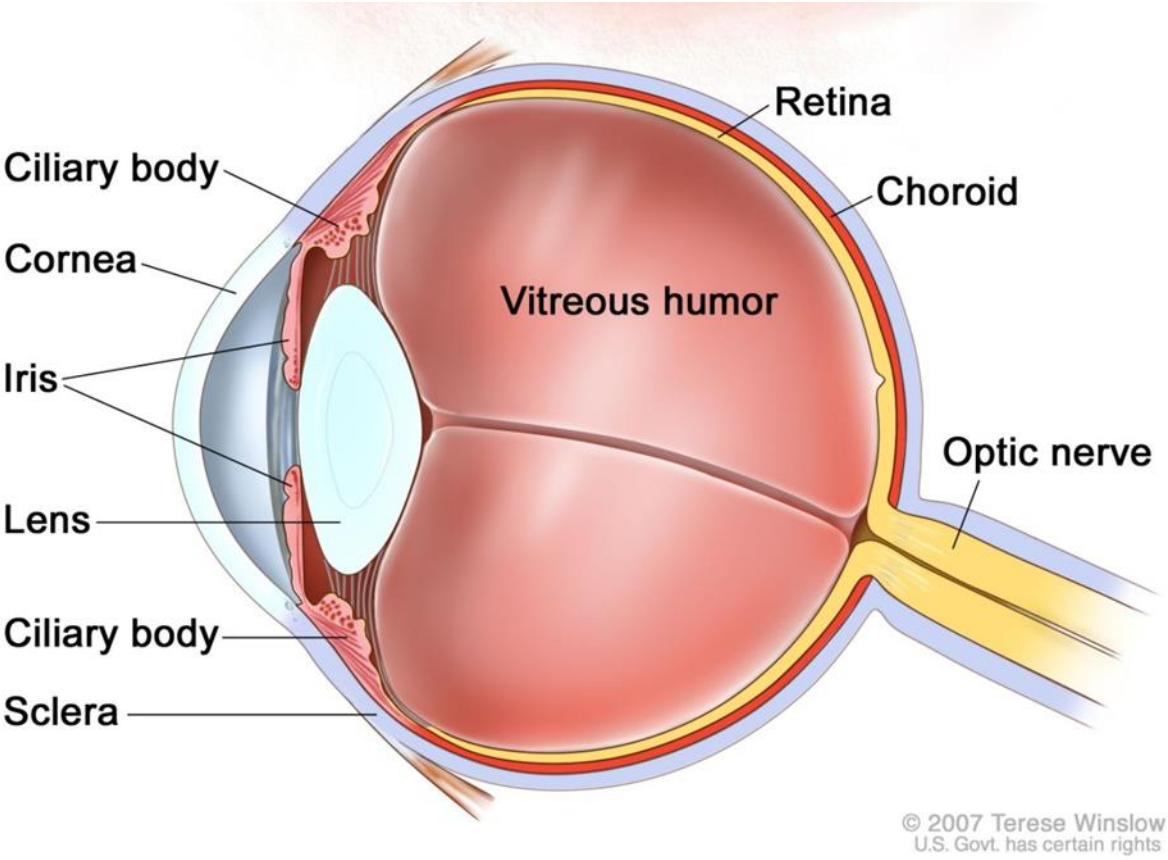



The image above shows the side view location of the vitreous humour.

# Chapter 4 The Back of the Eye

## The Last Layer

The last layer of the eye that is in the back of the eye is made up of four parts. They are the vitreous body, the retina, the choroid, and the optic nerve.




The image above is a side view of the back of the eyeball.

## The Vitreous body

**The vitreous body** is the last layer in front of the light-sensitive retina, but the retina is surrounded by one more layer in the back of the eye.

## The Choroid

**The choroid** is a darkly pigmented layer that contains large and medium blood vessels, capillaries, and a membrane in the choroid. This layer is located between the retina and the sclera. Dark pigmentation

prevents harmful light and toxicity into the blood vessels in the choroid. The choroid supplies oxygen and blood is transferred to the retina, it also temperature controls the retina.

## The Retina

As the light passes to **the retina**, it is converted by neurons that make up the retina called photoreceptors. The middle of the retina is called the macula, the macula includes the fovea which provides the most accurate visualization in the eye. The electrical nerve signal is inverted and sent to the optic nerve.

## The Optic Nerve

**The optic nerve** is the final step to sight, it is composed of millions of nerve fibers that sent all the inverted arrays of light to the brain for it to produce an image.

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