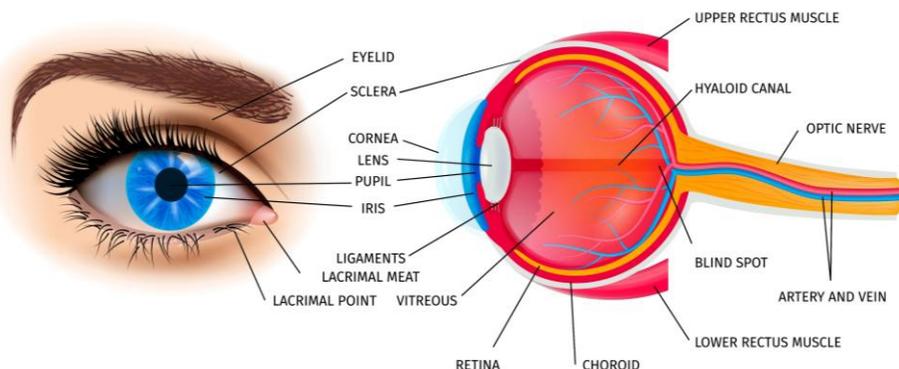


Introduction to the Eye

ANATOMY OF THE HUMAN EYE



Structural Parts of the Eye

The **sclera** is the white part of the eye that forms its shape. Aqueous fluids and the vitreous fill the chambers to keep the eye's shape.

The **conjunctiva** is the clear layer that covers the sclera and the inner side of eye lids (but not the cornea).

How the Eye Works

Our eyes let us see our surroundings by detecting light that reflects from objects. Then the eyes send signals to the brain through the optic pathways, which helps us figure out what we are seeing. Here is how the vision process works.

1. Light shines on an object, which reflects the light.
2. The reflected light goes into the eye through the **cornea**, which is the clear outer area that helps focus the light.
3. The light goes through the **pupil**, which is the opening in the middle area of the **iris** (the colored part of your eye). The muscles in the iris control the size of the pupil.
 - Bright surroundings → smaller pupil → less light goes into the eye
 - Dark surroundings → larger pupil → more light goes into the eye
4. The light then goes through the **lens**, which helps focus the light and directs it to the back of the eye.
 - Less curved lens → see things that are far away
 - More curved lens → see things that are close up
5. The light then reaches the **retina** that lines the back of the eye. The retina helps interpret the projected image.
6. The **macula** is the center of the retina. The cells on the macula include cones (which detects colors) and rods (which detect shades of gray). These cells sense the light and change it into electric signals.
7. The electric signals pass through the **optic nerves** towards the occipital lobes of the brain.
8. The brain interprets the signal and combines the images from our two eyes to build one image.
9. The brain compares the image with what we already know so that we can recognize the object.

Eye Colors

Eye color refers to the color of the **iris**. There are 6 main eye colours and many more possible shades. Read the Cleveland Clinic's article on [Eye Colors](#) for more info.

Eye Movements

Extraocular (outside the eye ball) muscles move the eyes:

- Left and right
- Up and down

Intraocular (inside the eye ball) muscles enable the eyes to:

- Focus near and far
- Allow more or less light through the pupil

The brain controls the muscles of both eyes so they move the same way at the same time. This helps make 1 clear image instead of 2.

Normal vision is also called "**20/20 vision**" in USA. A person with 20/20 vision can see what an average person can see on an eye chart when they are standing 20 feet away. 20 feet is equal to about 6 meters. In countries that use metric system, normal vision is called 6/6 vision.

Introduction to the Eye (continued)

Tears

- Tears are the clear fluid from the lacrimal gland.
- They drain into the tear ducts, which empty into the back of the nose, where they will evaporate or can be reabsorbed.
- **Lacrimation** is the medical term for shedding tears.
- Function of tears:
 - Keep the surface of the eyes wet and healthy
 - Wash away dirt and germs
 - Protect the cornea and supply it with oxygen
 - Help focus light that enters the eyes
 - Help communicate feelings

Eyelids

- Eyelids are the protective covering for the eyes:
 - Shield the eyes from outside objects, germs and lights
 - Keep the eyes moist
- Part of the **conjunctiva** forms the inner side of the eyelids. This membrane helps the eyelids move smoothly over the eyes.
- **Eyelashes** – the short hair on the eyelids, help capture dust, and detect danger.

Protecting the Eyes

- **Wear safety goggles** 
 - Protect your eyes when using chemicals (e.g. cleaning), playing sports, operating heavy equipment, working with wood or metal, gardening, renovating, etc.
- **Stay away from potential hazards** 
 - Beware of flying champagne corks, fireworks, nerf guns etc.
 - Cushion edges and corners where kids may bump into
- **Take breaks from screens** 
 - Prolonged use → dry eyes, eye strain
- **Wear Sunglasses when outside** 
- **Avoid eye infections** 
 - Make up: Never wear when sleeping, never share, never apply too close to the eyes, never use glitter
 - Contacts: Clean well, never wear when sleeping
- **Eat lots of fruits and vegetables** 
- **Avoid smoking and second hand smoke** 
- **Manage allergies** that affect the eye 
- **Get an eye exam** (For individuals with 22q differences: kids - every few years, adults – every 1-2 years) 
- Tell your optometrist or ophthalmologist about any **family history** of eye problems 

Eyecare Professionals

Opticians fit people with glasses (or contact lenses). They do not prescribe them or perform eye exams. If you go to an optician to get your eyeglasses, please bring your prescription.

Optometrists check the health of your eyes, such as your retinal health and the pressure inside your eyes. They will also examine how well you can see (far away and up close, ability to see colors, etc.) and can prescribe corrective eyeglasses.

Ophthalmologists are medical doctors who specialize in the health and diseases (e.g., cataracts, glaucoma, strabismus) of the eye. Their medical field is called **ophthalmology**. Typically, a person only needs to see an ophthalmologist if an optometrist has found a concern. Ophthalmologists can perform eye exams and prescribe glasses/contacts. They can also perform surgeries and procedures on the eyes.

Resources

- [The Visual System: How Your Eyes Work \(Video\)](#) – National Eye Institute, NIH
- [Eyes](#) – Cleveland Clinic
- [Eye Colors](#) – Cleveland Clinic
- [Parts of the Eye](#) – Mayo Clinic
- [Tears](#) – Cleveland Clinic
- [Optician, Optometrist, Ophthalmologist? Do you know the Difference?](#) – College of Opticians of Ontario
- [Difference Between an Ophthalmologist, Optometrist and Optician](#) – American Association for Pediatric Ophthalmology and Strabismus
- [Perfect Vision? 20 Tips to Keep It That Way](#) – American Academy of Ophthalmology
- ❖ [Image of eye anatomy by macrovector](#) – Freepik
- ❖ [Emojis from emojiopedia.org](#)