Science 8

Optics 7

Name:
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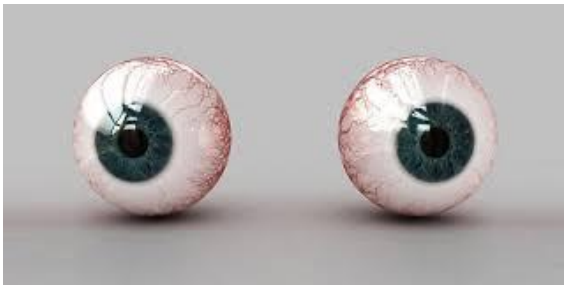
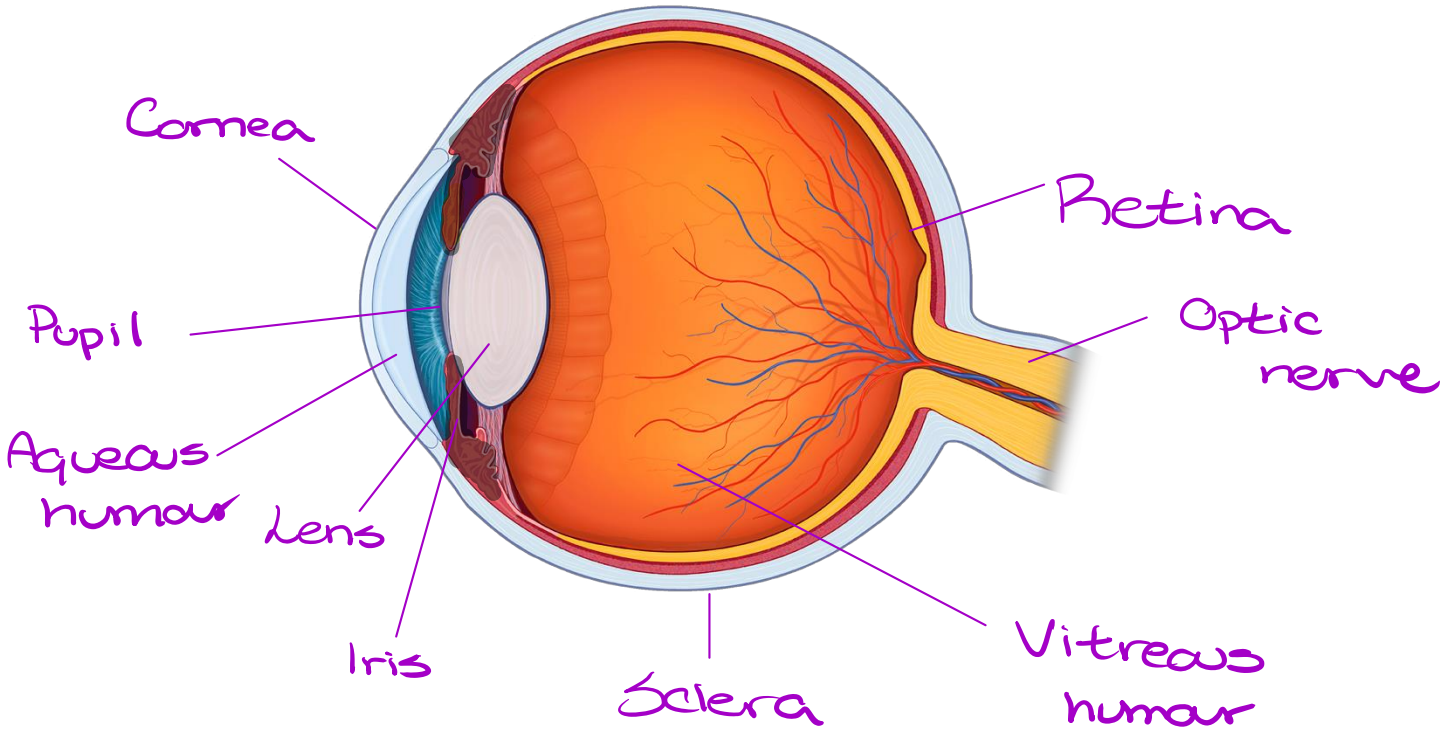
1. Human Eye

Human Eye



- Your eyes focus on 50 different objects every second.
- Eyes are able to process 36,000 pieces of information in a single hour
- The only organ more complex than the eye is the brain.
- Your eyes can distinguish approximately 10 million different colours.
- It is impossible to sneeze with your eyes open.
- Ommatophobia is a fear of the eyes.
- 80 percent of all learning comes through the eyes.
- Heterochromia is the medical term for having two different coloured eyes.
- The average person blinks 12 times a minute!

Let's Label!



Focusing System

1. **Cornea**

- Transparent material that covers the iris and pupil and holds they eye together

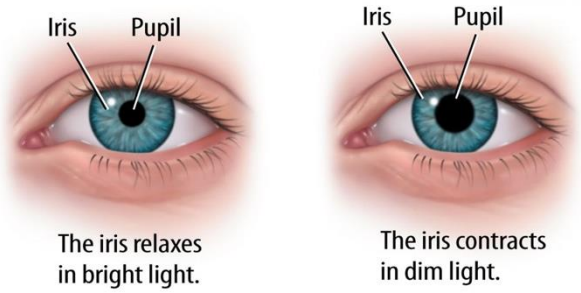
2. **Lens**

- A flexible convex structure behind the iris and pupil that focuses light towards the retina

Lighting

3. **Iris**

- Muscle that surrounds the eye
- Color of the eye
- Change its size
  - In dim light, iris contracts
  - In bright light, iris dilates



The iris relaxes in bright light.

The iris contracts in dim light.

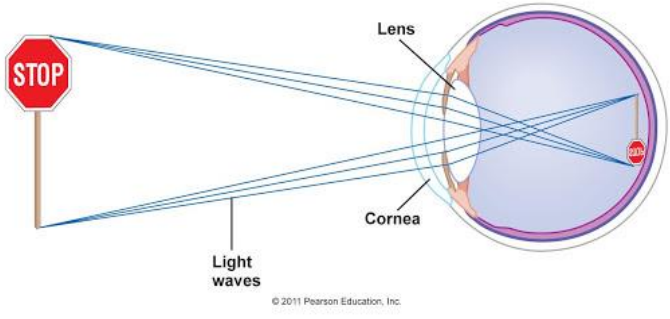
4. **Pupil**

- An opening where light. enters the eye
  - In dim light, the pupil dilate to let in more light
  - In bright light, the pupil constrict to let in less light

Communicating with the brain

5. **Retina**

- A screen at the back of the eye where the image is formed
- Image forms upside down!
- Contains specialized cells called rods and cones



6. **Optic Nerve**

- Communicates with the brain
- Carries visual signals

Structure

7. **Sclera**

- The __white__ region around the __eye__
- Helps to __protect__ the eye

8. **Aqueous Humour**

- The __watery__ fluid between the __cornea__ and __iris__
- Helps to maintains the __pressure__ of the eye

9. **Vitreous Humour**

- The __jelly-like__ fluid that gives __shape__ to the eye
- __Protects__ the eye and keeps the __retina__ in place

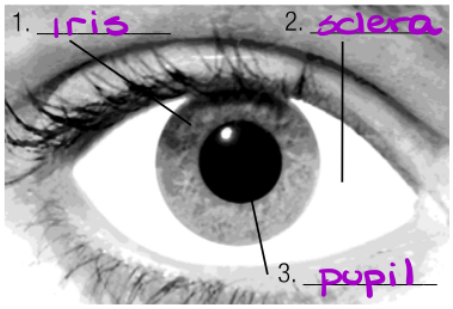
Video: The evolution of the Human Eye

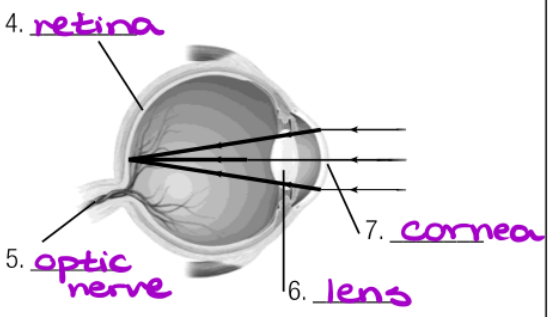
Parts of the eye

Use the vocabulary words in the box below to label the parts of the eye. Place the correct letter on the line next to each part of the eye.

Vocabulary

a. iris
b. lens
c. pupil
d. sclera
e. retina
f. cornea
g. optic nerve





Use the same vocabulary words in the box above to fill in the blanks below. Each word can be used only once.

8. Light rays are first refracted by the _____cornea_____.

9. Surrounding the cornea is an opaque white tissue called the _____sclera_____.

10. Light enters the eye through an opening in the centre called the _____pupil_____.

11. The _____iris_____ is the coloured circle of muscle surrounding the pupil. It controls the amount of light entering the eye.

12. Light then passes through the flexible, convex _____lens_____ which can change its shape.

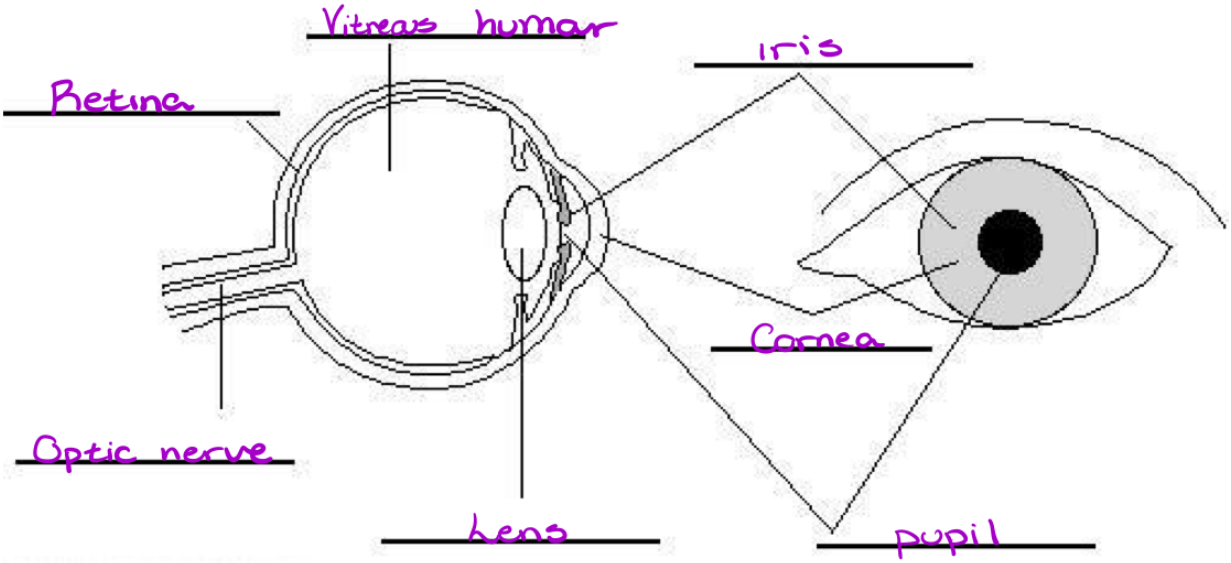
13. Once light is refracted by the lens, it is focussed on the _____retina_____ at the back of the eye, where an image is formed.

14. Light-sensitive cells detect the image and an electric message is sent to the brain through the _____optic nerve_____.

Practice:

Label the following diagram:

- Cornea
- Lens
- Iris
- ~~Optic Nerve~~ Vitreous humour
- Pupil
- Retina
- ~~Aqueous~~ Humour
  Vitreous.



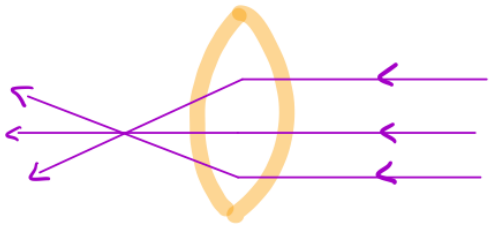
1. Why does the pupil appear dark?
   The pupil is where light enters the eye. The light rays entering the eye are absorbed by the tissues in the eye.
2. What part of the eye is referred to as grey, brown, blue or hazel?
   Iris
3. The iris can dilate or contract, changing the size of the pupil. In a dark room, will the iris dilate or contract? Why?
   Iris will contract in order to allow more light to enter into the pupil.

4. A covering called a cornea holds the iris and pupil together. How does light behave when passing through the cornea?

When light enters and passes through the cornea, the light gets bent and focused

↳ It refracts and focuses more of the light

5. The lens behind the pupil is convex. Draw what happens to the light rays as they pass through the pupil and hit the lens.



Converges

6. After the light rays pass through the lens, it hits the retina at the back of the eye. What material is in between the lens and the retina? What is the function of this material?

Vitreous humour

↳ transparent, colourless, gelatinous mass

↳ holds the shape of the eye

7. The retina is considered a "screen". Explain why this analogy is made.

Retina is a thin layer of tissue at the back of the eye

↳ Receives light that the lens has focused and converts it into signals

↳ This is where the image is formed

8. The light rays pass through the lens and reach the retina at the _focal_ _point_.

9. How does the retina communicate with the brain?

Through the optic nerve.