

MINISTRY OF EDUCATION
SECONDARY ENGAGEMENT PROGRAMME
GRADE 8
INTEGRATED SCIENCE

Week 9

Lesson 2

Topic: Sense Organs

Sub-topic: The Eye

Objectives: After observing pictures, students will:

- describe how the eye works to view near and distant objects correctly.
- explain correctly how the eye works to control the amount of light entering.
- List at least three (3) ways of caring for their eyes.

Content

Forming real images with convex lenses/ Accommodation

The lenses in our eyes help in the formation of images by focusing light.

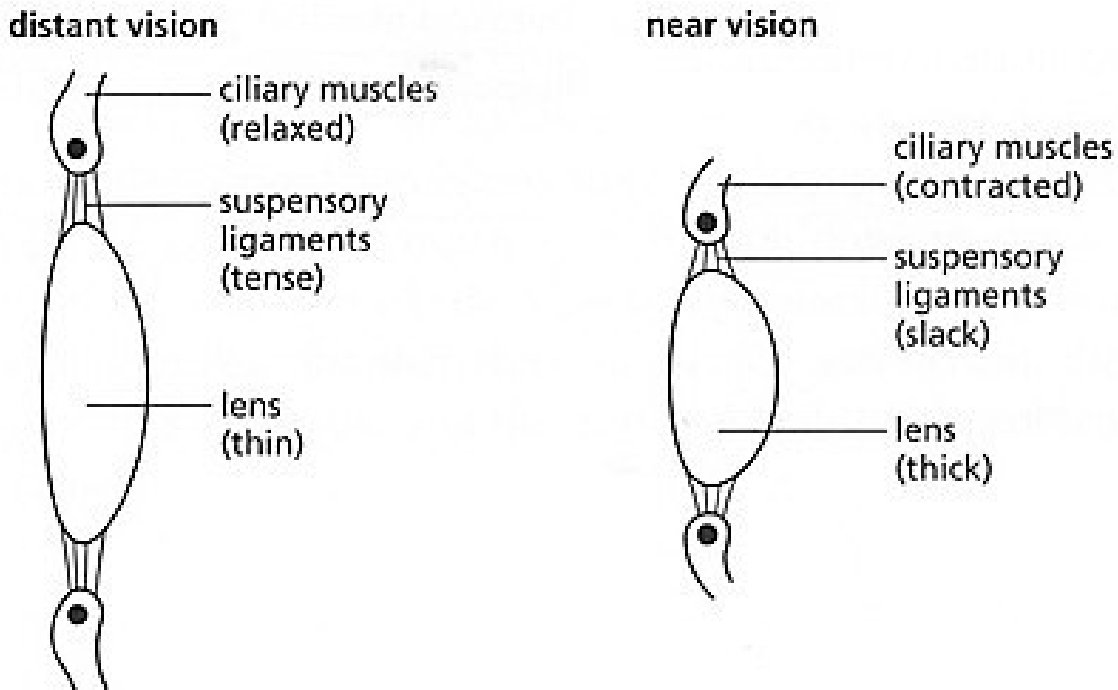
The type of lens in the eye is a convex lens which will bring a parallel beam of light to a focus. So the image formed on the retina of the eye is also inverted and smaller. The brain does a very wonderful thing in interpreting the image the right way up. The eye has to focus objects at different distances on to the retina. The distance between the lens and the retina in the eye cannot be altered, so the only way in which the eye can focus things at different distances is by changing the shape (thickness) of the lens. It does this by making the lens thicker or thinner. There are muscles at the sides of the lens which do this. This changing of the shape of the lens is called **Accommodation**.

Viewing Near objects

When you are looking at a near object, the lens needs to become more rounded at the central surface to focus the light rays. The crystalline lens changes shape to accommodate near or far targets.

Viewing Distant object

The eye can focus objects at different distances because the ciliary muscles push and pull to make the lens change shape. When you look at an object that is far away, the ciliary muscles relax and the lens have a flattened shape. Instead, our lenses just change shape to adjust for the distance of an object.

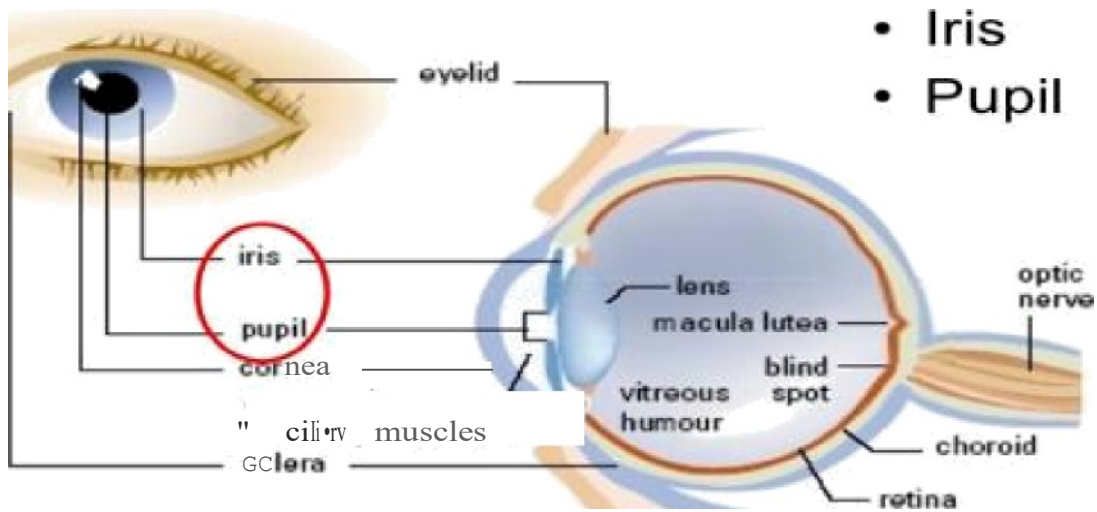


Controlling the brightness- changing the size of the pupil

The iris opens and closes to control the amount of light entering the eye through the pupil. The pupil is the opening in the center of the iris where light enters the eye. In the dim light, the opening in the center of the iris expands to allow more light to enter the pupil. The coloured part of the eye helps regulate the amount of light entering the eye. When there is a bright light, the iris closes the pupil to let in less light.

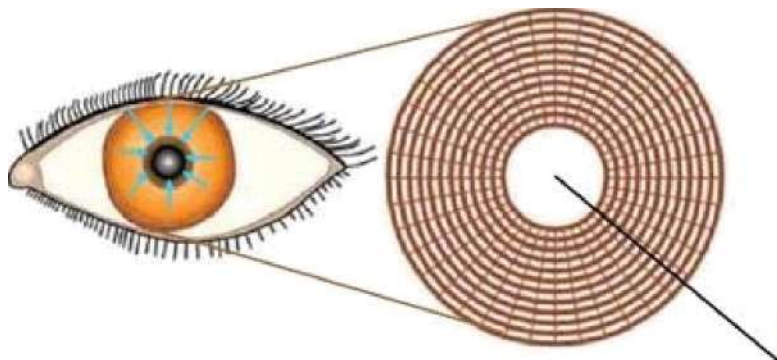
The correct amount of light must enter the eye. If too much light is let into the eye retinal damage could occur. However, if too little light passes into the eye then sight becomes difficult. This causes the pupil to constrict and less light enters the eye.

Regulating Amount of Light



Action of Iris in Bright Light

Circular muscles of the iris contract



Radial muscles of the iris relax

Pupil constricts and this reduces the amount of light entering the eye

Caring the Eyes

Since our eyes are very important to us we must take good care of them. The following are some ways how we can care for our eyes: -

- 1. Avoid rubbing your eyes-** The hands are exposed to a lot of dirt, dust, and bacteria, and all of these can be easily transferred to your peepers each time you touch or rub them. So avoid putting your hands to your eyes to prevent infection and irritation. If the habit is so ingrained on you, make an effort to get rid of it as soon as possible.
- 2. Practice frequent hand washing-** Wash your hands regularly to keep bacteria at bay and prevent them from getting in contact with your eyes, eyeglasses, and contact lenses.
- 3. Protect your eyes from the sun-** Exposure to sunlight and UV rays increases your risk for age-related macular degeneration and may cause cornea sunburn. So aside from making a fashion statement and adding oomph to your overall look, put on those sunglasses to protect your eyes. If wearing them is not what you like, then you should consider wearing UV-protected eyeglasses or contact lens. Putting on caps, visors, and hats are also advisable.
- 4. Stay hydrated-** Sufficient fluid intake is essential to your body's overall wellbeing, including the eyes. If you're hydrated enough, you prevent your eyes from getting dry and irritated.
- 5. Keep proper monitor distance and room lighting-** Computer monitors should be positioned about an arm's length away from the eyes and 20 degrees below eye level. This keeps your eyes from getting strained. Likewise, make sure that you have sufficient but diffused lighting in your room. Focused and too bright lights may result in glare, and this can put too much stress on the eyes.

- 6. Observe the 20-20-20 rule-** If you want to keep your eyes in great shape, you should adhere to the 20-20-20 rule, which states that:
- Every 20 minutes, look away from your computer monitor and fix your gaze on an object that's 20 feet away from you.
 - Blink 20 successive times to prevent eye dryness.
 - Every 20 minutes, get out of your seat and take 20 steps. This is not just good for your vision, but also promotes proper posture and blood circulation throughout the body. Yes, it keeps you from being sedentary too.
- 7. Get enough sleep-** Just like the rest of your body, your eyes need to recharge too, and this happens while you sleep. So make sure that you get sufficient shut-eye each day to keep your eyes revitalized and healthy.
- 8. Wear the appropriate eye safety gear for different activities-** No matter what you do, make sure that your eyes are protected. If you're going swimming, wear goggles to avoid exposing your eyes to chlorine. Meanwhile, if you're gardening or attending to a DIY project at home, put on safety glasses to protect your eyes from dust particles, bacteria, and injuries.

Home Work

1. List some other ways how you can care for your eye
2. Describe how the eye makes adjustments to view near and distant objects.
3. Explain how the eye works to control the amount of light entering the eye.

References

1. <https://www.arizonaretinalspecialists.com/blog/12-ways-to-take-care-of-your-eyes-everyday/>
2. Blackman, S., Bernard, M., Dalgety, F., & Sadoo, d.s (2000) Science in Daily Life Bk.2. Georgetown, Guyana. Ministry of Education, Guyana