





3. Identify each of the eye muscles indicated by leader lines in Figure 8-1. Color code and color each muscle a different color. Then, in the blanks below, indicate the eye movement caused by each muscle.

- 1. Superior rectus Superior + Medial
- 2. Inferior rectus Inferior + Medial
- 3. Superior oblique Inf. + Lateral
- 4. Lateral rectus Lateral
- 5. Medial rectus Medial
- 6. Inferior oblique Sup + Lateral

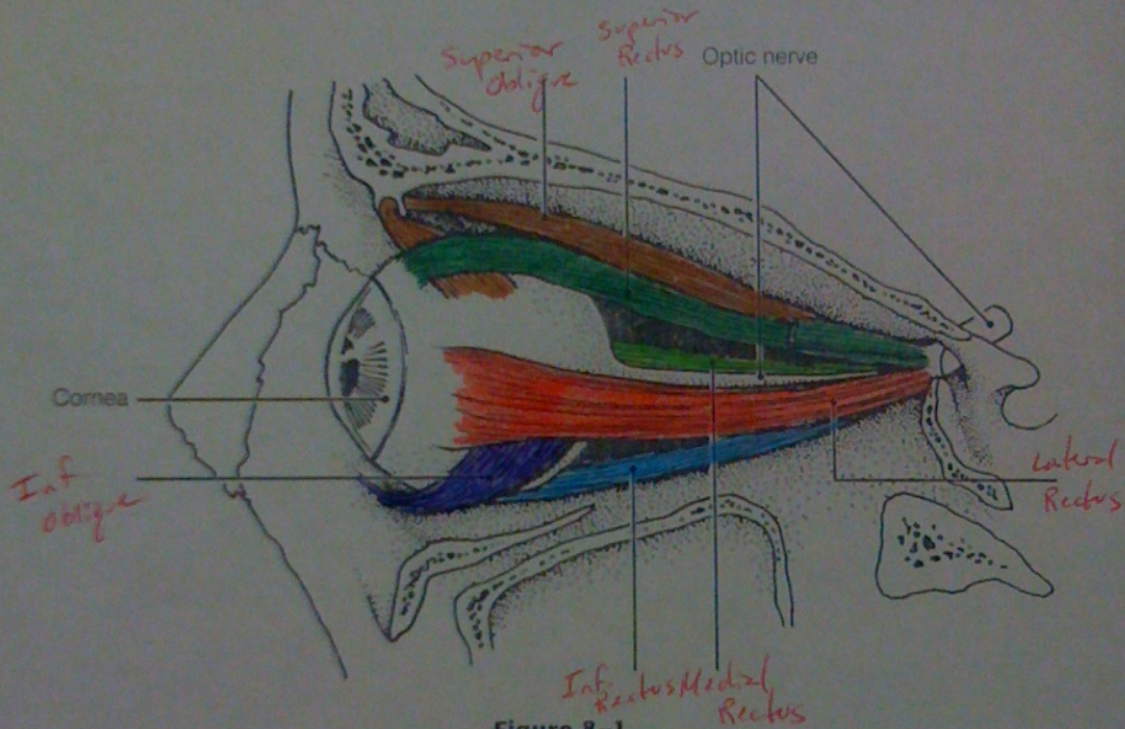


Figure 8-1

4. Three main accessory eye structures contribute to the formation of tears and/or aid in lubricating the eyeball. In the table, name each structure and then name its major secretory product. Indicate which of the secretions has antibacterial properties by circling that response.

Accessory eye structures	Secretory product
1. <u>Conjunctiva</u>	<u>Mucus</u>
2. <u>Lacrimal Glands</u>	<u>H<sub>2</sub>O + Lysozyme</u>
3. <u>Tarsal Glands</u>	<u>Oil</u>



5. Match the terms provided in Column B with the appropriate descriptions in Column A. Insert the correct letter response or corresponding term in the answer blanks.

Column A		Column B
<u>Refraction</u>	1. Light bending	A. Accommodation
<u>Accommodation</u>	2. Ability to focus for close vision (under 20 feet)	B. Accommodation pupillary reflex
<u>Emmetropia</u>	3. Normal vision	C. Astigmatism
<u>Hyperopia</u>	4. Inability to focus well on close objects; farsightedness	D. Cataract
<u>Photopupillary Reflex</u>	5. Reflex constriction of pupils when they are exposed to bright light	E. Convergence
<u>Cataract</u>	6. Clouding of the lens, resulting in loss of sight	F. Emmetropia
<u>Myopia</u>	7. Nearsightedness	G. Glaucoma
<u>Astigmatism</u>	8. Blurred vision, resulting from unequal curvatures of the lens or cornea	H. Hyperopia
<u>Glaucoma</u>	9. Condition of increasing pressure inside the eye, resulting from blocked drainage of aqueous humor	I. Myopia
<u>Convergence</u>	10. Medial movement of the eyes during focusing on close objects	J. Night blindness
<u>Accommodation Pupilary Reflex</u>	11. Reflex constriction of the pupils when viewing close objects	K. Photopupillary reflex
<u>Night Blindness</u>	12. Inability to see well in the dark; often a result of vitamin A deficiency	L. Refraction

6. The intrinsic eye muscles are under the control of which division of the nervous system? Circle the correct response.

1. Autonomic nervous system                      2. Somatic nervous system

7. Complete the following statements by inserting your responses in the answer blanks.

Convex 1. A (1) lens, like that of the eye, produces an image that is upside down and reversed from left to right. Such an image is called a (2) image. In farsightedness, the light is focused (3) the retina. The lens used to treat farsightedness is a (4) lens. In nearsightedness, the light is focused (5) the retina, it is corrected with a (6) lens.

Real 2.

Behind 3.














Convex 4.

In front 5. Concave 6.



8. Using the key choices, identify the parts of the eye described in the following statements. Insert the correct term or letter response in the answer blanks.

*Key Choices*

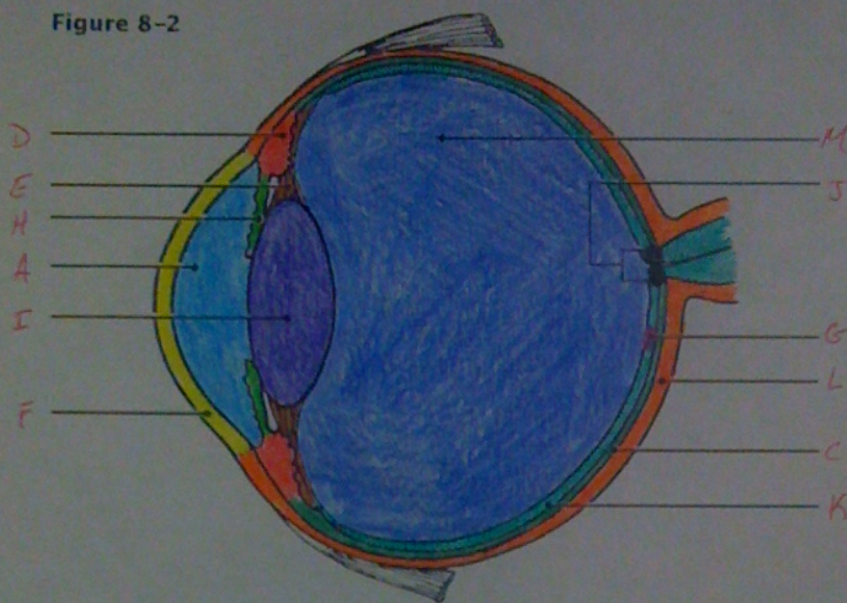
- |   |  |   |
|---|--|---|
| A.  Aqueous humor    | F.  Cornea          | K.  Retina         |
| B.  Canal of Schlemm | G.  Fovea centralis | L.  Sclera         |
| C.  Choroid          | H.  Iris            | M.  Vitreous humor |
| D.  Ciliary body     | I.  Lens            |   |
| E.  Ciliary zonule   | J.  Optic disk      |   |

- Ciliary Zonule 1. Attaches the lens to the ciliary body
- Aqueous Humor 2. Fluid in the anterior segment that provides nutrients to the lens and cornea
- Sclera 3. The "white" of the eye
- Optic Disk 4. Area of retina that lacks photoreceptors
- Ciliary Body 5. Contains muscle that controls the shape of the lens
- Choroid 6. Nutritive (vascular) layer of the eye
- Canal of Schlemm 7. Drains the aqueous humor of the eye
- Retina 8. Layer containing the rods and cones
- Vitreous Humor 9. Gel-like substance that helps to reinforce the eyeball
- Choroid 10. Heavily pigmented layer that prevents light scattering within the eye
- Ciliary Body 11. Iris 12. Smooth muscle structures (intrinsic eye muscles)
- Fovea Centralis 13. Area of acute or discriminatory vision
- Cornea 14. Aqueous Humor 15. Refractory media of the eye (#14-17)
- Lens 16. Vitreous Humor 17.
- Cornea 18. Most anterior part of the sclera—your "window on the world"
- Iris 19. Pigmented "diaphragm" of the eye

9. Using the key choice terms given in Exercise 8, identify the structures indicated by leader lines on the diagram of the eye in Figure 8-2. Select different colors for all structures provided with a color-coding circle in Exercise 8, and then use them to color the coding circles and corresponding structures in the figure.



Figure 8-2



10. In the following table, circle the correct word under the vertical headings that describes events occurring within the eye during close and distant vision.

Vision	Ciliary muscle		Lens convexity		Degree of light refraction	
1. Distant	Relaxed	Contracted	Increased	Decreased	Increased	Decreased
2. Close	Relaxed	Contracted	Increased	Decreased	Increased	Decreased

11. Name in sequence the neural elements of the visual pathway, beginning with the retina and ending with the optic cortex.

Retina → Optic Nerve → Optic Chiasm → Optic Tract  
 Synapse in thalamus → Optic Radiation → Optic cortex

12. Complete the following statements by inserting your responses in the answer blanks.

- There are Three varieties of cones. One type responds most vigorously to Blue light, another to Green light, and still another to Red light. The ability to see intermediate colors such as purple results from the fact that more than one cone type is being stimulated Simultaneously. Lack of all color receptors results in Total color blindness.
- Because this condition is sex linked, it occurs more commonly in Males. Black and white, or dim light, vision is a function of the Rods.



13. Circle the term that does not belong in each of the following groupings

- 1. Choroid      Sclera      Vitreous humor      Retina
- 2. Ciliary body      Iris      Superior rectus      Choroid
- 3. Pupil constriction      Far vision      Accommodation      Bright light
- 4. Proprioceptor      Rods      Cones      Photoreceptors
- 5. Ciliary body      Iris      Suspensory ligaments      Lens
- 6. Inferior oblique      Iris      Superior rectus      Inferior rectus
- 7. Retina      Pigmented layer      Photoreceptors      Neural layer

14. Complete the statements concerning rod photopigment and physiology by writing your responses in the answer blanks.

- Opsin 1. The bent or kinked form of retinal is combined with a protein called (1) to form the visual pigment called (2). When light strikes the visual pigment, it straightens out and breaks down into its two components. This event is called (3) because the purple color of the visual pigment changes to (4) and finally becomes (5) as retinal is converted all the way back to vitamin (6).
- Rhodopsin 2.
- Photobleaching 3.
- Yellow 4.
- Colorless 5. A 6.

### THE EAR: HEARING AND BALANCE

15. Using the key choices, select the terms that apply to the following descriptions. Place the correct letter in the answer blanks.

*Key Choices*

- A. Anvil (incus)      F. External acoustic meatus      I. Pinna      M. Tympanic membrane
- B. Pharyngotympanic tube      G. Hammer (malleus)      J. Round window      N. Vestibule
- C. Cochlea      H. Oval window      K. Semicircular canals
- D. Endolymph      L. Stirrup (stapes)

- E 1. I 2. M 3. Structures composing the outer ear
- C 4. K 5. N 6. Structures composing the bony or osseous labyrinth
- A 7. F 8. L 9. Collectively called the ossicles
- B 10. N 11. Ear structures not involved with hearing