

NAME _____

LAB TIME/DATE _____

Special Senses: Vision

Anatomy of the Eye

1. Name five accessory eye structures that contribute to the formation of tears and/or aid in lubrication of the eyeball, and then name the major secretory product of each. Indicate which has antibacterial properties by circling the correct secretory product.

Accessory structures	Product

2. The eyeball is wrapped in adipose tissue within the orbit. What is the function of the adipose tissue?

3. Why does one often have to blow one's nose after crying?

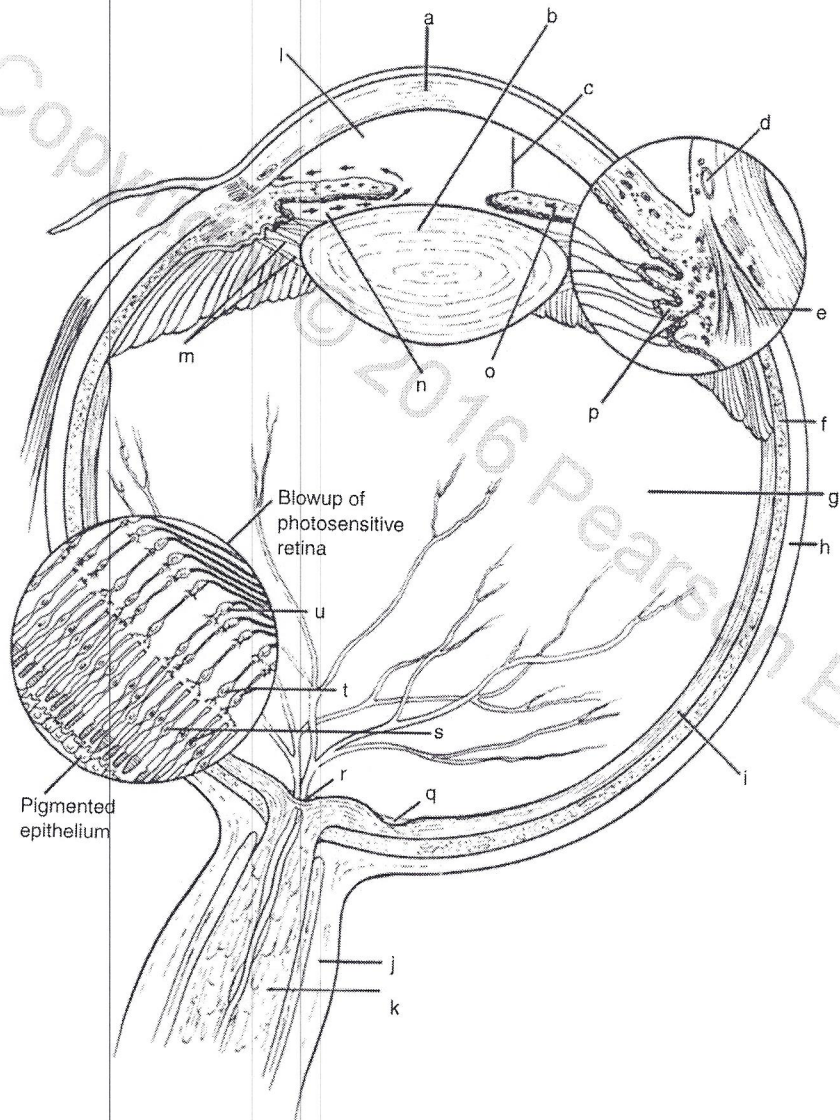
4. Identify the extrinsic eye muscle predominantly responsible for each action described below.

- _____ 1. turns the eye laterally
- _____ 2. turns the eye medially
- _____ 3. turns the eye up and laterally
- _____ 4. turns the eye inferiorly and medially
- _____ 5. turns the eye superiorly and medially
- _____ 6. turns the eye down and laterally

5. What is a sty?

Conjunctivitis?

6. Correctly identify each lettered structure in the diagram by writing the letter next to its name in the numbered list.



- _____ 1. anterior chamber
- _____ 2. anterior segment
- _____ 3. bipolar neurons
- _____ 4. choroid
- _____ 5. ciliary body and processes
- _____ 6. ciliary muscle
- _____ 7. cornea
- _____ 8. dura mater
- _____ 9. fovea centralis
- _____ 10. ganglion cells
- _____ 11. iris
- _____ 12. lens
- _____ 13. optic disc
- _____ 14. optic nerve
- _____ 15. photoreceptors
- _____ 16. posterior chamber
- _____ 17. retina
- _____ 18. sclera
- _____ 19. scleral venous sinus
- _____ 20. suspensory ligaments (ciliary zonule)
- _____ 21. posterior segment

Notice the arrows drawn close to the left side of the iris in the diagram above. What do they indicate?

7. The iris is composed primarily of two smooth muscle layers, one arranged radially and the other circularly.

Which of these dilates the pupil? _____

8. You would expect the pupil to be dilated in which of the following circumstances? Circle the correct response(s).

- a. in bright light b. in dim light c. focusing for near vision d. observing distant objects

9. The intrinsic eye muscles are controlled by (circle the correct response):

autonomic nervous system somatic nervous system

10. Match the key responses with the descriptive statements that follow.

- | | | |
|--|--------------------|-------------------------|
| Key: a. aqueous humor | e. cornea | j. retina |
| b. choroid | f. fovea centralis | k. sclera |
| c. ciliary body | g. iris | l. scleral venous sinus |
| d. ciliary processes of the ciliary body | h. lens | m. vitreous humor |
| | i. optic disc | |

- _____ 1. fluid filling the anterior segment of the eye
- _____ 2. the "white" of the eye
- _____ 3. part of the retina that lacks photoreceptors
- _____ 4. modification of the choroid that controls the shape of the crystalline lens and contains the ciliary muscle
- _____ 5. drains the aqueous humor from the eye
- _____ 6. layer containing the rods and cones
- _____ 7. substance occupying the posterior segment of the eyeball
- _____ 8. forms the bulk of the heavily pigmented vascular layer
- _____ 9. smooth muscle structures (2)
- _____ 10. area of critical focusing and discriminatory vision
- _____ 11. form (by filtration) the aqueous humor
- _____ 12. light-bending media of the eye (4)
- _____ 13. anterior continuation of the sclera—your "window on the world"
- _____ 14. composed of tough, white, opaque, fibrous connective tissue

Microscopic Anatomy of the Retina

11. The two major layers of the retina are the epithelial and neural layers. In the neural layer, the neuron populations are arranged as follows from the pigmented epithelial layer to the vitreous humor. (Circle the proper response.)

bipolar cells, ganglion cells, photoreceptors

photoreceptors, ganglion cells, bipolar cells

ganglion cells, bipolar cells, photoreceptors

photoreceptors, bipolar cells, ganglion cells

12. The axons of the _____ cells form the optic nerve, which exits from the eyeball.

13. Complete the following statements by writing either *rods* or *cones* on each blank.

The dim light receptors are the _____. Only _____ are found in the fovea centralis, whereas

mostly _____ are found in the periphery of the retina. _____ are the photoreceptors that operate best

in bright light and allow for color vision.

Dissection of the Cow (Sheep) Eye

14. What modification of the choroid that is not present in humans is found in the cow eye? _____

What is its function? _____

15. What does the retina look like? _____

At what point is it attached to the posterior aspect of the eyeball? _____

Visual Pathways to the Brain

16. The visual pathway to the occipital lobe of the brain consists most simply of a chain of five cells. Beginning with the photoreceptor cell of the retina, name them and note their location in the pathway.

1. _____ 4. _____

2. _____ 5. _____

3. _____

17. Visual field tests are done to reveal destruction along the visual pathway from the retina to the optic region of the brain. Note where the lesion is likely to be in the following cases.

Normal vision in left eye visual field; absence of vision in right eye visual field: _____

Normal vision in both eyes for right half of the visual field; absence of vision in both eyes for left half of the visual field: _____

18. How is the right optic *tract* anatomically different from the right optic *nerve*? _____

Visual Tests and Experiments

19. Match the terms in column B with the descriptions in column A.

Column A

- _____ 1. light bending
- _____ 2. ability to focus for close (less than 20 feet) vision
- _____ 3. normal vision
- _____ 4. inability to focus well on close objects (farsightedness)
- _____ 5. nearsightedness
- _____ 6. blurred vision due to unequal curvatures of the lens or cornea
- _____ 7. medial movement of the eyes during focusing on close objects

Column B

- a. accommodation
- b. astigmatism
- c. convergence
- d. emmetropia
- e. hyperopia
- f. myopia
- g. refraction