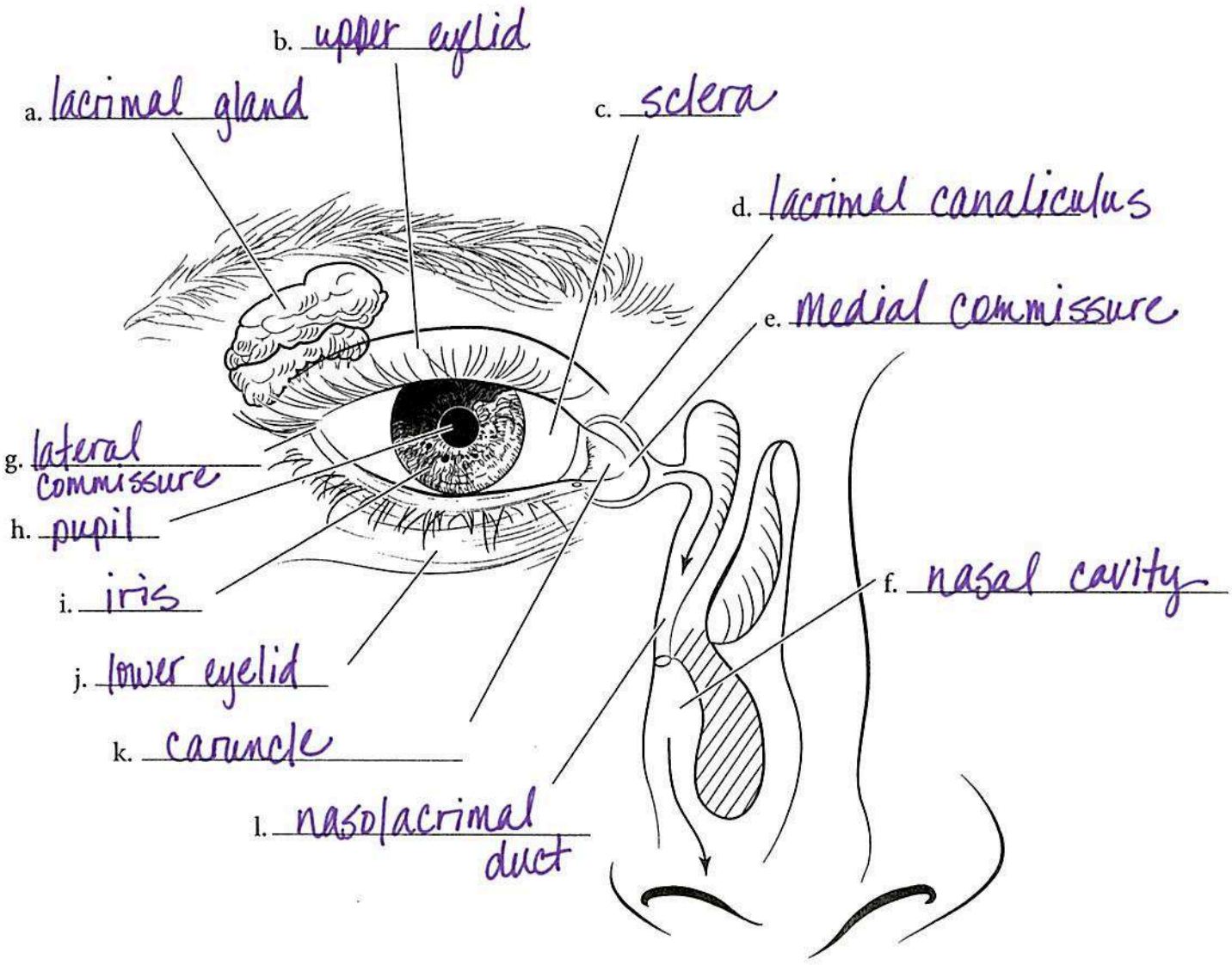
ANTERIOR SURFACE OF THE EYE AND LACRIMAL APPARATUS

The eye is located in the orbit of the skull and has several external features. Above the eye is the **eyebrow.** The corners of the eye have either a **lateral commissure** or a **medial commissure.** Next to the medial commissure is the **caruncle,** a small thickened tissue in the medial corner of the eye. The outer surface of the eye is protected by the **upper** and **lower eyelids.** The blink reflex rapidly closes the eyelids to keep dust from hitting the outer surface of the eye. Label and color the **sclera** (the white of the eye), **iris** (the colored part of the eye), **pupil** (the opening that lets light into the back of the eye), and the eyelids. There is a transparent extension of the sclera called the **cornea,** and it covers the iris and pupil.

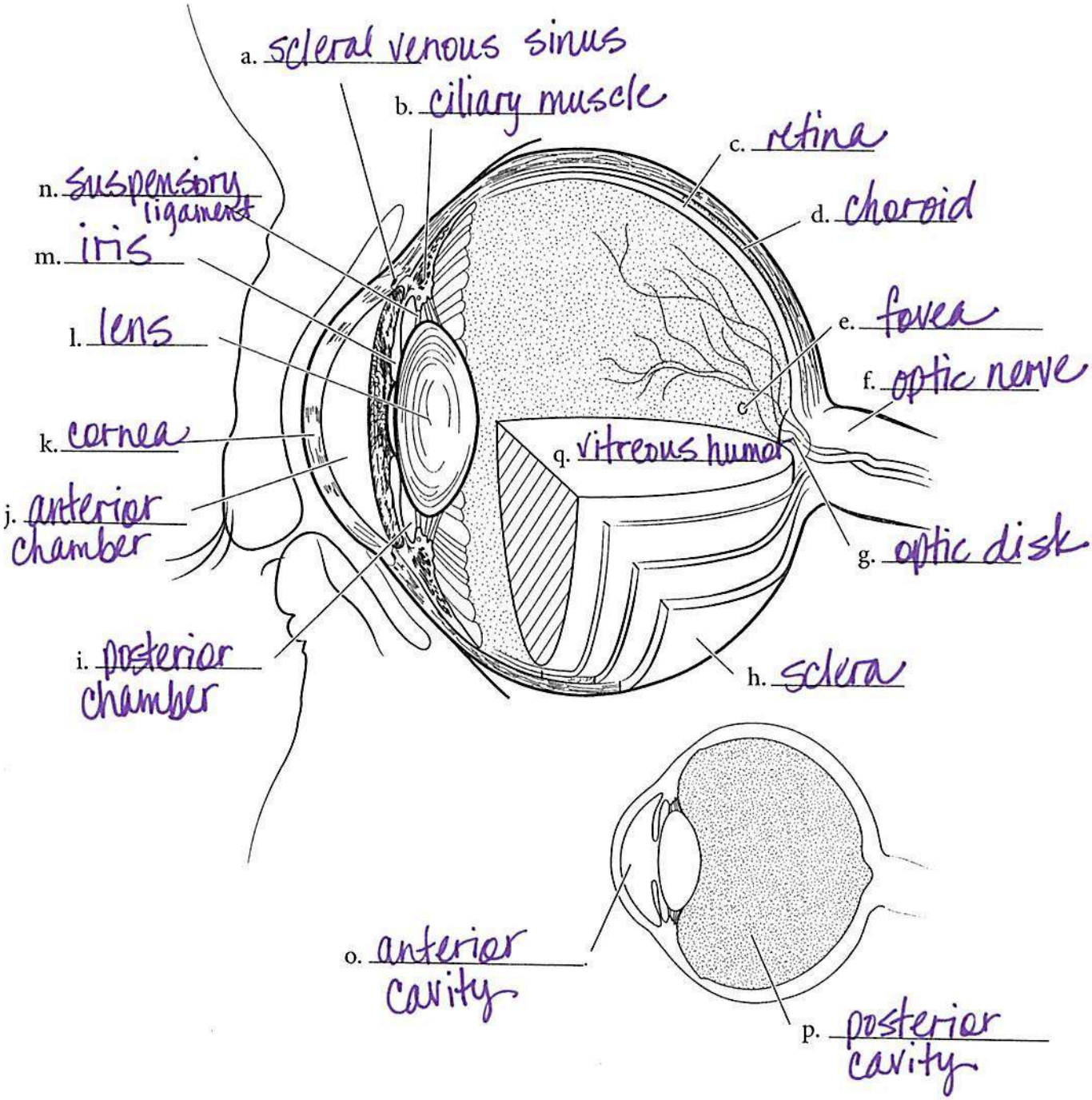
The eyes are kept moist and are subject to potential bacterial infection. Tears have antimicrobial properties and are formed by the **lacrimal gland.** They contain digestive enzymes and wash microbes from the surface of the eye. Tears drain from the eye into the **lacrimal canaliculi.** These canaliculi lead into the **nasolacrimal duct** and then into the **nasal cavity.**



MEDIAN SECTION OF THE EYE

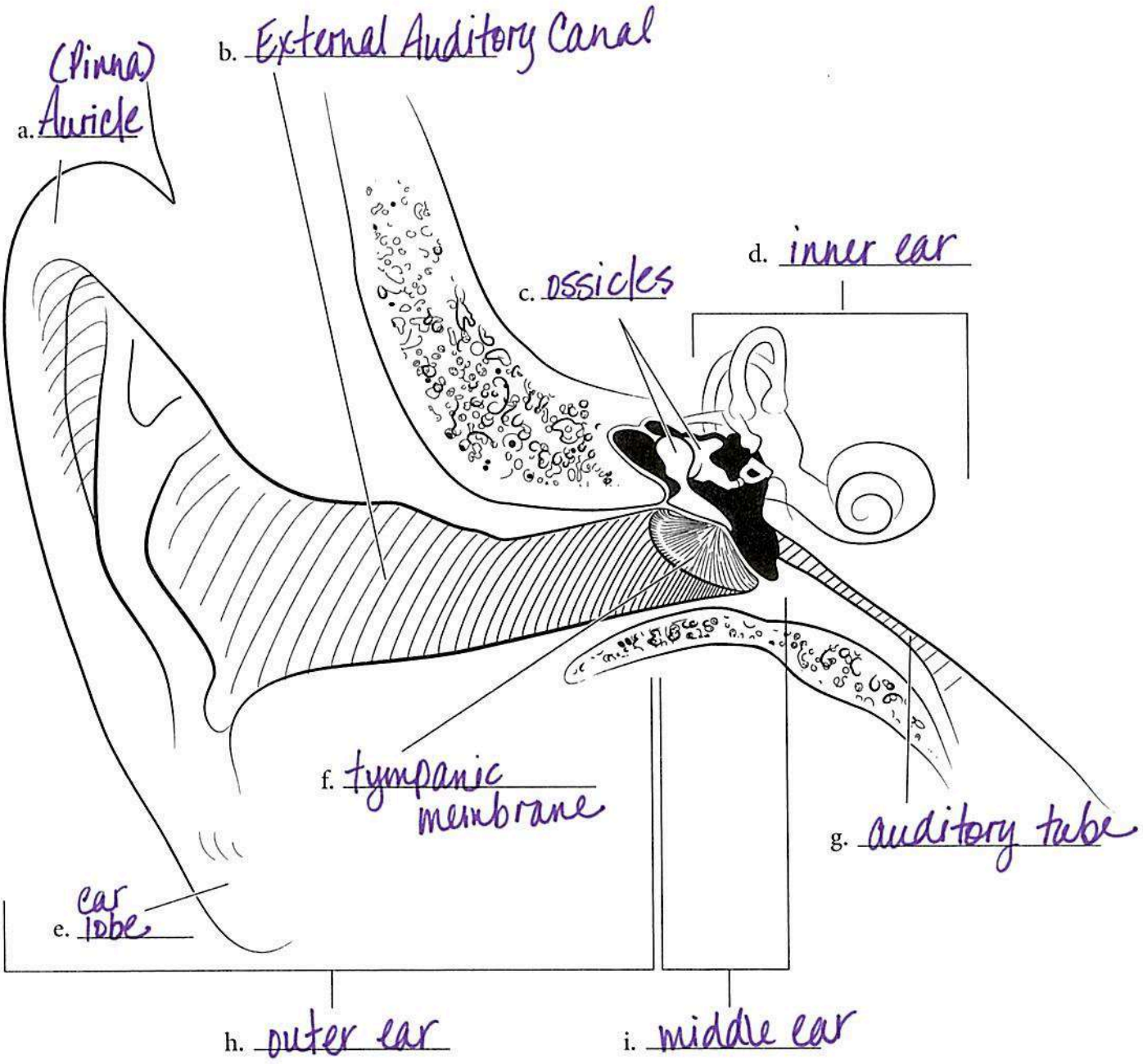
The **cornea** is the outermost part of the eye, and it is responsible for most of the light refraction in the eye (the bending of light rays). On the periphery of the cornea is the **sclera**, which helps maintain eye shape. The space behind the cornea is the **anterior cavity**, which is found in front of the **lens**. It is composed of two smaller chambers, the **anterior chamber** and the **posterior chamber**. The anterior chamber is between the cornea and the **iris**, the part that determines eye color. The posterior chamber is between the iris and the **lens**. The lens is made of protein and is held to the wall of the eye by the **suspensory ligaments**. These ligaments are pulled by the **ciliary muscle** on the wall of the eye. When the ligaments tighten, the lens flattens and the eye focuses on distant objects. The fluid in the anterior cavity is known as **aqueous humor** and it is released by the ciliary body and reabsorbed in the **scleral venous sinus**.

Behind the lens is the **posterior cavity**. This cavity is filled with a jellylike material called **vitreous humor**. Light travels through this medium to the back of the eye where it strikes the **retina**. The retina is the region of the eye where light waves are converted to nerve impulses. The **fovea** is a small area of the retina where there is a high concentration of cones (cells that determine color and visual acuity). Behind the retina is the **choroid**, a darkened layer that absorbs light, making vision sharp during the daytime. Behind this layer is the sclera, the white of the eye, where muscles attach. At the posterior of the eye, you can see the **optic disk**. This is where the **optic nerve** takes visual impulses from the eye to the brain. Color the median section of the eye after you have filled in the appropriate labels.



OVERVIEW OF THE EAR

The ear consists of three major regions, the **outer ear**, the **middle ear**, and the **inner ear.** The outer ear consists mainly of two parts, the **auricle** (**pinna**), including the **ear lobe** and the **external auditory canal.** The middle ear begins at the **tympanic membrane** (eardrum). Inside the tympanic membrane is the tympanic cavity, another part of the middle ear. Here you should label the ear **ossicles** and the **auditory tube** (Eustachian tube). The inner ear consists of three major regions, the **cochlea**, the **vestibule**, and the **semicircular ducts.** Use a different color for each major region of the ear.



MIDDLE EAR

The middle ear consists of the **tympanic cavity** and structures in that cavity. It is connected to the nasopharynx by the **auditory tube**. This tube allows for equalization of pressure from the middle ear and the external environment. The three ear ossicles transfer sound from the tympanic membrane to the **oval window** of the inner ear. Label the three ear ossicles, the **malleus**, **incus**, and **stapes**, and color each one a different color. Color the oval window where the stapes connects and use lighter colors for the auditory tube and the tympanic cavity.

INNER EAR

The inner ear consists of the **cochlea**, the **vestibule**, and the **semicircular ducts**. In Latin, the name *cochlea* means "snail shell" and it spirals like a snail. Its function is to translate the mechanical vibrations of sound into nerve impulses. The cochlea has an **oval window** that attaches to the stapes and a **round window** that allows for changes in pressure to occur in the inner ear. Label the cochlea and color it in. The vestibule has two parts, the **utricle** and the **saccule**. These are involved in equilibrium. They determine static equilibrium whereby a person can determine the position of the body at rest. They also register acceleration. Color each of these parts of the vestibule a different color. The semicircular ducts respond to angular acceleration. There are three semicircular ducts, the **posterior**, the **anterior**, and the **lateral semicircular ducts**. Color each of the semicircular ducts a different color.