

Solutions

2.1 Cerebellum; medulla.

2.2 Contract; loosen/slacken; thicker.

2.3 Myopia/short sight; concave spectacle/contact lens (or laser surgery to reshape the cornea, replacement lens).

3.1 In dim light the radial muscles of the iris contract, so the pupil dilates/widens; more light enters the eye and reaches the retina's receptors; the response is automatic and rapid, not involving the conscious brain.

3.2 For near focus the ciliary muscles contract and the suspensory ligaments loosen; the lens becomes thicker and refracts light rays more strongly; this focuses the book's image exactly on the retina. In hyperopia, near objects focus behind the retina because the lens cannot refract enough/eyeball too short; a convex lens adds refraction so the image focuses on the retina.

3.3 Any two, effect + mechanism: vasoconstriction – skin blood vessels narrow so less blood flows near the surface, reducing energy transfer to the environment; shivering – rapid involuntary muscle contractions, and respiration in the muscles transfers energy as heat, warming the blood. Also accept: sweating stops, so no energy is lost by evaporation.