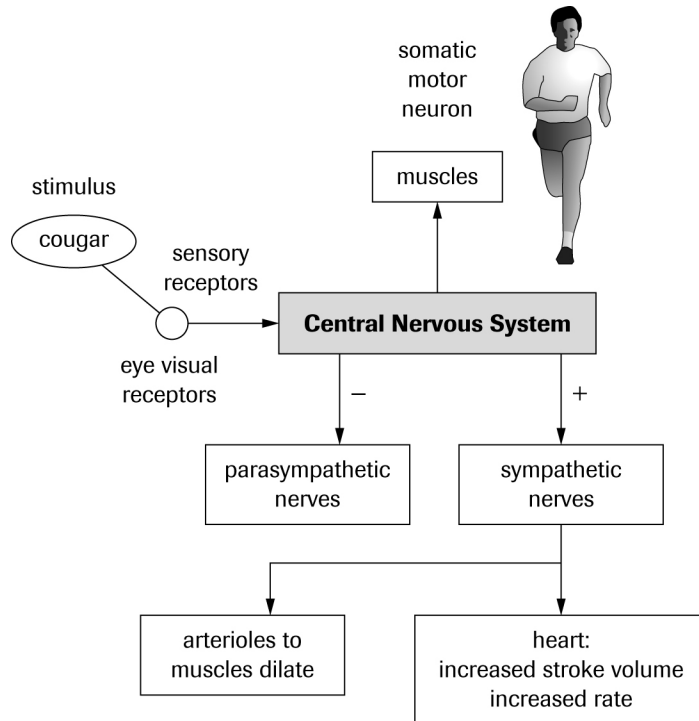


CHAPTER 14 SUMMARY

Make a Summary

(Page 465)

1.



2. Students' answers will likely be more detailed, contain appropriate vocabulary, and reflect any revisions to previous misconceptions.

CHAPTER 14 REVIEW

(Pages 466–467)

Part 1

1. D
2. A
3. B (A could also be interpreted to be correct as light also is transmitted through the cornea)
4. 4, 2, 1, 3
5. B
6. C
7. 3, 1, 2, 4
8. C
9. B
10. 2, 4, 3, 1

Part 2

11. The cold temperature receptors fire most frequently at about 26 °C.
12. The hot temperature receptors fire most frequently at about 42 °C.
13. Since the average firing frequency of the cold receptors is higher than that of the warm receptors, it is reasonable to conclude that the body is more sensitive to cold stimuli.

14. The cold temperature receptors may show an increased sensitivity at 50 °C because they cannot become adapted to the stimulus at this temperature. Sensory adaptation occurs once a receptor becomes adapted to the stimulus, and the neuron ceases to fire. This is thought to indicate that the new environmental condition is not dangerous. Since temperatures of 50 °C and above can cause harm, having the cold temperature receptors respond to this range would protect the organism.
15. The cones are high light-intensity photoreceptors that detect colour. This enables the chicken to distinguish tiny objects on the ground, such as seeds or small insects. Subtle differences in colour and texture can be detected. However, because the chicken's eyes have so many cones, they do not have many rods. This means that they have very poor night vision and are therefore susceptible to predation at night or when there is very little light.
16.
 - To test if excess reading causes myopia, you could compare the vision of avid readers, average readers, and non-readers. You would have to control factors such as the age and health of the individuals.
 - To test whether there is a link between myopia and genetics, you could compare the vision of people within and among families (or genetic groups). If there is a link between reading and myopia, then you would have to control for this in the study.
17. The lens hardens as you age as extra protein layers are added. This decreases the near-point accommodation, and people tend to become farsighted.
18. Only certain specialized hair cells along the basilar membrane of the cochlea have been destroyed. Each frequency or pitch excites a specific part of cochlea. Violent vibration may dislodge the specialized hairs.
19. Simple colour discrimination tests might be suggested. It is important to consider light intensity and distance from the object. A control should also be introduced. Students might suggest testing younger and older subjects with a variety of paintings. The paintings should be varied in their colour content—some primarily blue, some primarily green, purple, yellow, and so on. They could ask the subjects to describe which paintings were more vivid. Alternatively, students could obtain a simple colour filter (made from cellophane) from an art supply store or find a pair of yellow sunglasses. They could then show several paintings as above to their peers, asking them how vivid the colours in the paintings were. Subjects would probably have trouble distinguishing blues and purples but would find the yellows and oranges to be very intense.
20. How does age affect near-point accommodation?
21. Hypothesis: As age increases, near-point accommodation decreases.
22. 50 years
23. The lens becomes thicker and less flexible with age due to a buildup of protein over the lens. When this occurs, the lens can no longer adjust to objects that are near the eye, and reading glasses become necessary.

CHAPTER 15 Endocrine System

Starting Points

(Page 468)

See the Teacher's Resource, pages 502–503, for examples of answers that show common misconceptions.

1. Students are unlikely to know the specifics of the body's response to stress at this point. They should be aware of the fact that the brain detects a stressful situation and sends a message to the hypothalamus and that the hypothalamus responds by sending its own message to another part of the body (the spinal cord or the anterior pituitary gland). The spine or the anterior pituitary then secretes a hormone that affects the adrenal medulla or the adrenal cortex,