Name _____ Date _____ Class _____

Guided Reading Activity 8-2

The Senses

For use with textbook pages 214–222

Directions: Recalling the Facts Use the information in your textbook to answer the questions.

1. How do sensory receptors make it possible for you to perceive external stimuli?
external stimulus is converted into a chemical-electrical message that is relayed to brain

2. What are the differences between rods and cones?
Rods - (black + white vision) - require less light, night vision
Cones - (color vision) - require more light, daytime vision

Found in retina!
75-150 million
6-7 million

3. Why does a pea look green?
- reflects green light and absorbs all other colors

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4. Why do some people see the world in only blacks, whites, and shades of gray?
possess non-functional cones

X-linked recessive

retinal disparity

5. Why would you perceive one object as closer than another?
larger retinal disparity for the closer object than object farther away

differences between the images stimulating each eye

6. How would you describe the sound of a bass guitar at a rock concert in terms of sound waves?
Rock concert = loud = high waves (amplitude)
Bass = low rates of vibration

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Deafness:
Conduction - outer or middle ear damage - use hearing aids
Sensorineural - damage to cochlea - cochlear implants

7. How can your ears tell you from which direction a sound is coming?
sound reaches slowest ear first and will be slightly louder in that ear

8. If you experience dizziness while riding a roller coaster, what is likely occurring?
overstimulation of vestibular sense

semicircular canals

9. Why does food often taste bland when you have a cold?
stuffy nose = reduced smell = diminished taste

10. How does feeling pain benefit you?
alerts body of injury to body tissues / indicates to stop harmful activity

11. What process makes it possible to bounce a basketball without looking at it?
receptors in muscles, tendons, and joints (kinesthetic sensations)
- cooperation of vestibular/visual senses

The Senses

I. Sight

1. Sclera
   - outermost layer of the eye
   - protects the eye

   Cornea - front of the sclera (transparent)

2. Choroid
   - middle layer of the eye
   - possesses many blood vessels

   Iris - muscles that respond to incoming light (colored part)

   Lens - focusing structure (biconvex)

3. Retina
   - innermost layer of the eye
   - images (upside-down) transferred to neurons

   Optic Nerve - transmits image impulses to the brain

   Rod Cells - sense black & white images

   Cone Cells - sense colored images

Absolute Threshold = seeing a candle flame 30 miles away on a clear night

II. Hearing

1. Outer Ear
   Pinnae / Auditory Canal - collects and funnels sound

   Eardrum - transmits sound

2. Middle Ear
   Hammer, Anvil, & Stirrup - bones that vibrate due to eardrum
   - relays sound to the inner ear

   Eustachian Tube - equalizes air pressure

3. Inner Ear
   Cochlea - detects sound and relays impulses to brain (via auditory nerve)

   Semicircular Canals - balance organ; detects head movements

Absolute Threshold = hearing a watch ticking 20 feet away

III. Touch

- sensory receptors respond to heat, cold, pressure, & pain (beneficial)

Skin - largest sensory organ

Absolute Threshold = feeling a bee's wing falling a distance of 1 cm onto your cheek

IV. Taste

- detects substances that are sweet, salty, sour, & bitter
- sensory interactions with smell

Taste Buds - chemoreceptors located on tongue, roof of mouth, lips, & throat

Absolute Threshold = tasting 1 tsp. of sugar dissolved in 2 gallons of water

V. Smell

-chemoreceptors located in the upper part of the nasal cavity

Olfactory Nerve - transmits sensations of smell to the brain

Absolute Threshold = smelling 1 drop of perfume in a 3-room house

VI. Vestibular

- sense of balance

Semicircular Canals - fluid-filled with sensitive hairs
- located in the inner ear

Vestibular-Cochlear Nerve - transmits sensation of balance to the brain

Cerebellum - part of the brain that responds to balance sensory stimuli

VII. Kinesthetic

- sense of movement and body position
- receptors located in and near muscles, tendons, & joints