Name Date Class

Note-taking Worksheet

Light

Section 1 The Behavior of Light

A. Light and matter—objects must _____ light to be seen.

1. _____ materials do not allow light to pass through them; they only absorb and reflect light.
2. Some light passes through _____ materials.
3. _____ materials allow almost all light to pass through them; only a little light is absorbed and reflected.

B. Reflection of light—a light wave strikes an object and _____

1. _____—the angle at which light strikes a surface is the same as the angle at which it is reflected
2. _____ reflection—reflection of light waves from a smooth surface
3. _____ reflection—reflection of light waves from a rough surface

C. _____—change in the speed of a light wave when it passes from one material to another

1. _____—indicates how much a material reduces the speed of light; the more light is slowed, the _____ the index of refraction
2. _____—separate white light into visible spectrum based on light wavelengths
3. _____—caused by water droplets refracting wavelengths of sunlight
4. Refraction of light through air layers of different densities can result in a(n) _____.

Section 2 Light and Color

A. _____—determined by wavelength of light an object reflects

1. Objects appear to be _____ because they reflect all colors of visible light.
2. Objects appear to be _____ because they absorb, rather than reflect, all colors of visible light.
3. Filter—transparent material that _____ all colors except the color or colors it transmits
4. _____ can make objects appear to be different colors.

Meeting Individual Needs

Note-taking Worksheet (continued)

B. Seeing color—light enters the eye and is focused on the _____.

1. Retina—made up of two types of _____ that absorb light

a. _____—distinguish colors and detailed shapes; most effective in daytime vision

b. _____—sensitive to dim light; most effective in nighttime vision

2. _____ results when one or more sets of cones do not function properly.

C. Mixing colors

1. _____—colored material that absorbs some colors and reflects others

2. Primary colors of light—red, green, and _____

3. Primary colors of _____—magenta, cyan, and _____

4. Primary colors of light are _____ colors—combine to form white

5. Primary colors of pigments are _____ colors—combine to form black, the absence of reflected light

Section 3 Producing Light

A. _____ **lights**—hot tungsten wire glows; gives off light and heat

B. _____ **lights**—electrons collide with gas atoms, releasing ultraviolet radiation absorbed by phosphors lining the bulb; gives off light

1. Use _____ energy than incandescent bulbs

2. Last _____ than incandescent bulbs

C. _____ lights—tubes filled with gas (usually neon) produce light from electron collisions; different colors can be made by adding different gases

D. _____ lights—heated neon gas glows and warmth turns sodium into a vapor, producing a yellow-orange glow; used for _____ lighting

E. _____ lights—have a filament and gas enclosed in a glass bulb to produce intensely bright light

F. _____—light beam produced when identical atoms send off identical light waves; can be made from gases, liquids, or solids

1. Lasers produce _____—waves of same wavelength are aligned, and travel same direction

Note-taking Worksheet (continued)

2. _____—waves of multiple wavelengths are not aligned, travel in many directions
3. Lasers are used in many areas such as industry, science, communication, _____, and _____.

Section 4 Using Light

A. _____—light waves vibrate in only one direction after passing through a polarizing filter.

B. _____—process used to create a three-dimensional photographic image of an object

1. Illuminating objects with laser light produces _____.
2. Holographic images are _____ to copy.

C. When laser light must travel long distances or to hard-to-reach places, _____ are used.

1. _____—light strikes a surface between two materials and is completely reflected back to the first material
2. Uses of optical fibers
   - **a.** _____—send enormous numbers of messages in coded light beams
   - **b.** _____—internally explore the body

D. _____—read intensities of reflected light and convert the information to digital signals

1. Used in stores to read price on pattern called _____
2. Used in U.S. Postal Service to _____ and keep track of deliveries
3. Used in office machines such as _____ machines and fax machines