Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hr. \_\_\_\_\_

**Properties of Light**

* Every time you \_\_\_\_\_ something, \_\_\_\_\_\_\_\_\_\_ is involved.
* \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ in the room reflect off the page and into your eyes.
* The \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ carries information that allows your brain to form an \_\_\_\_\_\_ of the page.
* Light travels \_\_\_\_\_\_ and over long distances.
* Light can carry \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Light travels in \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_.
* Light can be bent by \_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_ by mirrors, heat and warmth.
* Light has \_\_\_\_\_\_\_\_\_\_.
* Light can be \_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_.

**The electromagnetic spectrum**

* \_\_\_\_\_\_\_\_\_\_, like sound and heat, is a form of \_\_\_\_\_\_\_\_\_\_.
* The \_\_\_\_\_\_\_\_\_ *\_\_\_\_\_\_\_\_\_\_* we see is part of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *\_\_\_\_\_\_\_\_\_\_\_.*
* Most \_\_\_\_\_\_\_\_\_\_ is produced by atoms.

**Light comes from atoms**

* In order to get \_\_\_\_\_\_\_\_\_*out* of an atom, you must put some \_\_\_\_\_\_\_\_\_\_ *into* the atom first.
* Making light with \_\_\_\_\_\_\_\_\_ is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Atoms in the filament convert \_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy to \_\_\_\_\_\_\_\_\_ and then to \_\_\_\_\_\_\_\_\_.
* To make light, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ bulbs use high-voltage electricity to energize atoms of \_\_\_\_ in the bulb.
* These atoms release the \_\_\_\_\_\_\_\_\_\_\_ energy \_\_\_\_\_\_\_\_\_\_\_ as light (not \_\_\_\_\_), in a process called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Color and energy**

* We call the combination of all colors \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_.
* Not all light has the same \_\_\_\_\_\_\_\_\_\_.
* **\_\_\_\_\_\_\_\_\_\_\_** is how we perceive the \_\_\_\_\_\_\_\_\_\_\_ of light.
* Just as \_\_\_\_\_\_\_\_\_\_ is made of atoms, light energy comes in tiny wave bundles called \_\_\_\_\_\_\_\_\_\_\_\_\_.
* Each \_\_\_\_\_\_\_\_\_\_\_\_has its own color (\_\_\_\_\_\_\_\_\_\_).

 

* All of the colors in the rainbow are \_\_\_\_\_\_\_\_ of different \_\_\_\_\_\_\_\_\_\_\_\_.
* Red light has the \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ we can see, and violet light the \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_.
* As we move through the rainbow from red to yellow to blue to violet, the \_\_\_\_\_\_\_\_\_ of the light \_\_\_\_\_\_\_\_\_\_\_\_\_.

**The speed of light**

* The speed at which light travels through \_\_\_\_\_\_ is about \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ meters per second.
* The speed of light is so fast that when lightning strikes a few miles away, we hear the thunder \_\_\_\_\_\_\_\_\_\_ we see the lightning.

**Wavelength of light**

* Because the wavelength of light is so small, scientists measure it in **nanometers**.
* One nanometer (nm) is one billionth of a meter (0.000000001 m).

**Wavelength and Frequency of Visible Light**



**What kind of wave is light?**

* Light is an **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.**
	+ **Electromagnetic waves DO NOT need a \_\_\_\_\_\_\_\_\_\_.**
* Red light is a traveling \_\_\_\_\_\_\_\_\_\_\_\_ (wave) with a frequency of about 450 THz.
* If you could shake the magnet up and down 450 *trillion* times per second, you would make waves of red light.

**The electromagnetic spectrum**

* The entire range of electromagnetic waves, including all possible frequencies, is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.**
* This spectrum includes \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_:
	+ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ light
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_



**PRACTICE**

Match the words to their definitions.

|  |  |
| --- | --- |
| 1. Fluorescence \_\_\_\_\_\_\_ | a. electromagnetic waves with more energy than visible  light & cause sunburn |
| 2. Electromagnetic Spectrum \_\_\_\_\_\_ | b. Heating something up so hot that it gives off light |
| 3. Incandescence \_\_\_\_\_\_ | c. the range of waves that included radio waves, light,  and x-rays |
| 4. Radio waves \_\_\_\_\_\_ | d. Electromagnetic waves that we feel as heat |
| 5. Infrared waves \_\_\_\_\_ | e. electromagnetic waves that have very low energy & wavelengths of many meters |
|  6. x-rays \_\_\_\_\_ | f. electromagnetic waves that have very high energy & come from nuclear reactions |
| 7. gamma rays \_\_\_\_\_ | g. stimulating atoms to give off light using electricity to simulate atoms of gas |
| 8. Ultraviolet rays \_\_\_\_\_ | h. Electromagnetic waves that can pass through skin and make images of the body |

9. Arrange the following in order from LOWEST energy to HIGHEST energy: gamma rays, visible

 light, x-rays, microwaves, radio waves, infrared light, ultraviolet light.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_