**Science SOL 5.3 Notes**

Use notes from Science SOL 5.3 PowerPoint to complete

**Light**

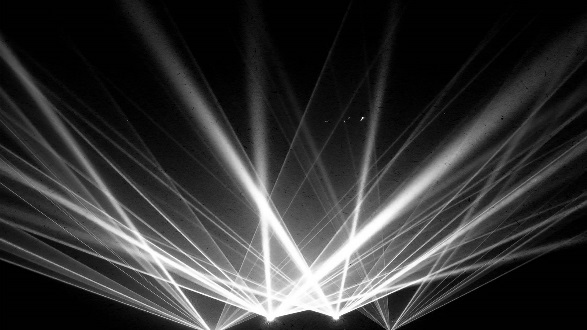
**What is Light?**

* Light is a form of **­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Light travels in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** waves
* It has both **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** fields and is referred to as electromagnetic radiation



**How Does Light Travel?**

* Light travels in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** paths called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and do not need a medium (solid, liquid, or gas) through which to move
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-** the straight line that represents the path of light
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-** a group of parallel rays



**Parts of a Light Wave**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-** the distance between two consecutive waves, usually measured crest-to-crest or trough-to-trough
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-** the highest point on a wave
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-** a valley between two waves or the lowest point of a wave
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-** the number of waves passing a given point in one second

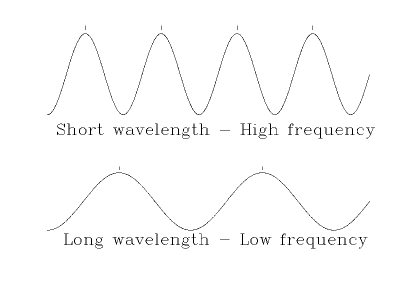
\*\*\*the greater the frequency, the greater the amount of energy

**Draw a Light Wave**

**Light is a Form of Energy**

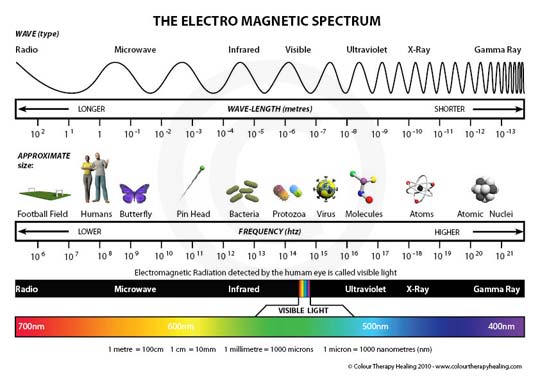
* Light waves are waves of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* The amount of light in a wave is related to its **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* **\_\_\_\_\_\_\_\_\_\_\_**frequency light has **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** energy
* **\_\_\_\_\_\_\_\_\_\_\_** frequency light has **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** energy
* The more **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in a light wave in a given period of time, the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the energy level

**Frequency of a Light Wave**

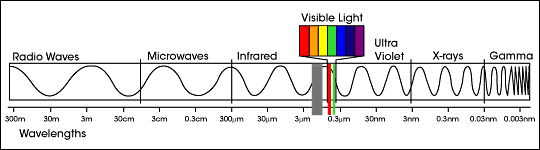
**Electromagnetic Spectrum**

* The entire range of electromagnetic radiation (light) is called the electromagnetic spectrum



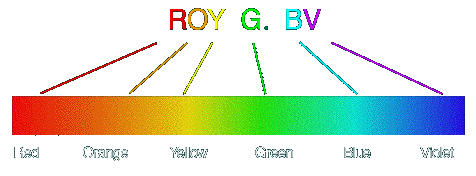
**Visible/White Light**

* Within the electromagnetic spectrum, the area that we see as light is known as “**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**” or “**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**”
* Of the visible light, **\_\_\_\_\_\_\_\_\_\_\_\_\_** would have the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** wavelength and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (purple) has the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



**Visible/White Light**

* The white light/visible light that we see is really a combination of several different **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of light traveling together
* These wavelengths are represented by the colors: **\_\_\_\_\_\_\_\_\_\_\_**, orange, **\_\_\_\_\_\_\_\_\_\_\_\_\_**, green, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, and violet
* Acronym to remember order of visible light: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

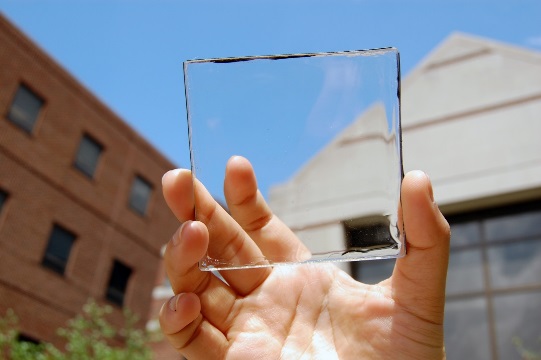


**How Light Passes Through Objects**

* Light passes through some materials **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and does not pass through other materials at all
* The terms **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, translucent, and opaque indicate the amount of light that **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** through an object

**Transparent**

* Allows **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** light to pass though
* Examples: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, clear plastic wrap, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, air



**Translucent**

* Allows **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** light to pass through
* Examples: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, frosted glass, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, some plastics, and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



**Opaque**

* Does **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** light to pass through
* Examples: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, wood, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, aluminum foil, and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

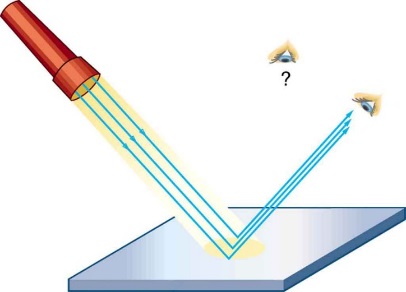
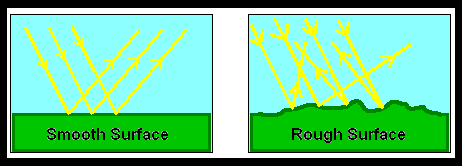


**When Light Hits an Object**

* Light travels in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** until it hits an object
* It can bounce off an object or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* It can be bent or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* It can pass through an object or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Or it can be absorbed as **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

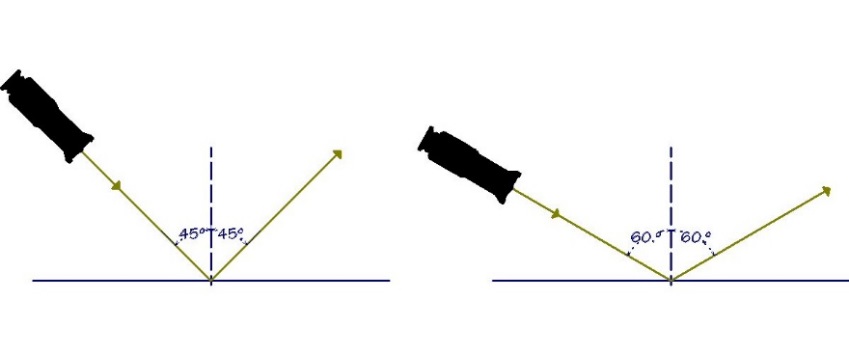
**Reflection**

* Light **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** an object
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** objects are better at reflecting light than other objects (ex. mirrors)
* When light bounces off a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** surface, it is scattered in many directions

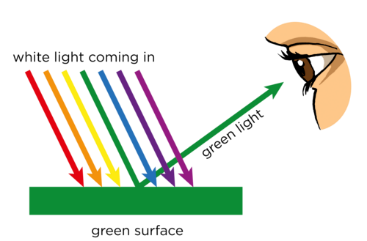
**Law of Reflection**

* The Law of Reflection states that when light hits a surface, the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** at which it is reflected (bounces off) is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** as the angle at which it strikes



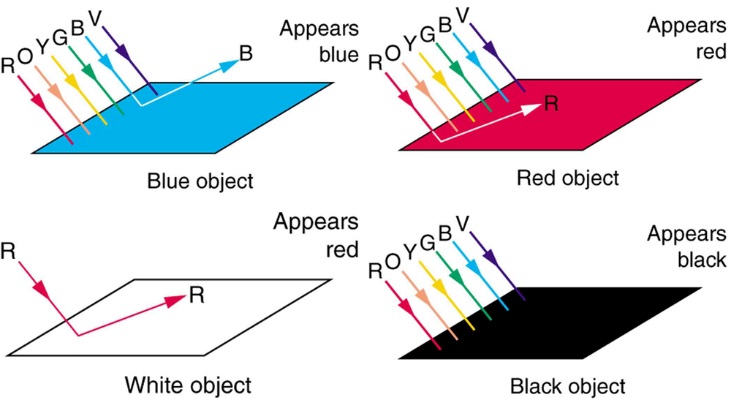
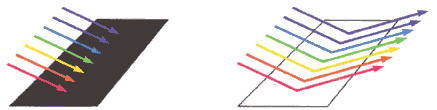
**Reflecting Colors**

* The**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of an object is the color of the light it reflects
* Grass looks green because it is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** green light and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** all the other colors



**Black and White**

* Black and white are **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** on the spectrum
* Black is when a material **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** all of the visible light and no light is reflected back
* White is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of all visible light together

**Refraction**

* Light travels in straight lines, but when it passes at an angle from one transparent medium to another, it can be **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* The speed of light **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** as it passes from one transparent object to another.
* The speed of the light wave changes, but its frequency **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

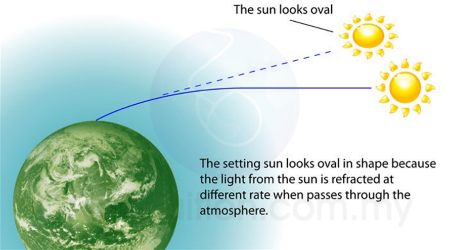
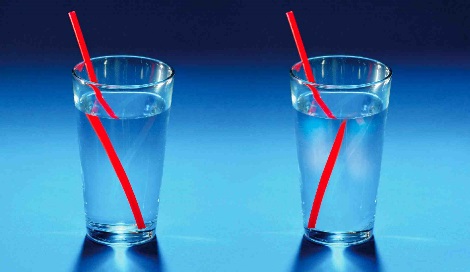
**Refraction**

* The amount of bending of the light wave depends on:

1. The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the material it is entering
2. The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the light wave
3. The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** at which the original light wave enters the new medium

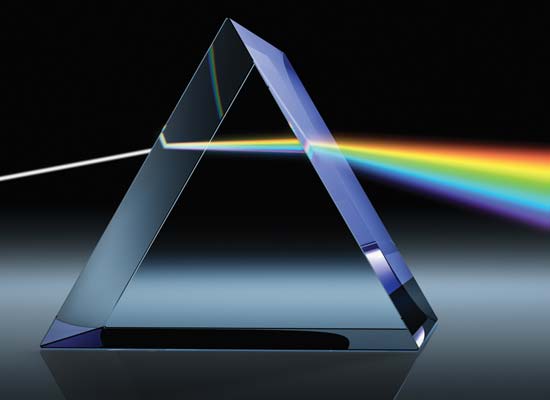
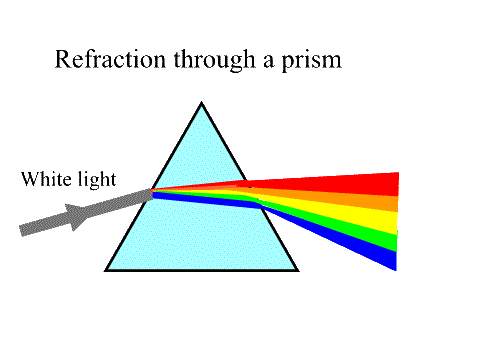
**Examples of Refraction**

* A setting sun looks **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** instead of round
* A straw appears to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** when it is placed in a glass of water
* Objects appear **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in water than they actually are

**Prisms**

* A prism can be used to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** white/visible light
* When the different wavelengths of light in white light pass through a prism, they are **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** at different **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**(refracted)
* The colors of light we see are red, orange, yellow, green, blue, and violet



**Rainbows**

* A rainbow is an example of both **refraction** and **reflection**
* Sunlight is first **refracted** when it enters the surface of a spherical raindrop
* It is then **reflected** off the back of the raindrop, and once again **refracted** as it leaves the raindrop

