

Notes for Atmospheric Interactions

Radiant Energy

- Energy from the Sun travels to Earth as radiant energy in the form of electromagnetic waves
- Visible light waves is the only part of electromagnetic spectrum we can see
- White light – all colors combined – ROYGBIV
- Different wavelengths – red is the longest and violet is the shortest

Wave Behavior

- Reflected light waves bounce back off object
- Transmitted light waves travel through object
 - Transparent – all light travels through
 - Translucent – only some light travels through
- Absorbed light waves do not pass through or bounce off
 - Opaque – no light travels through

- **Pigments – chemicals in substances that absorb some colors of light and reflect others. (We see reflected light).**

Light Refraction

- **The bending of light as it changes speed when traveling from one medium to another (example - from air to water)**
- **As light changes mediums, the different wavelengths of colored light bend at different rates. Red bends the least and violet bends the most.**
- **When light enters a prism, the different wavelengths of light refract or bend and separate into the colors of the rainbow.**
- **Rainbows occur when light passes through water droplets in the air and the different wavelengths of light are refracted and separated.**

Scattering of Light

- **Occurs when light waves strike atoms in the atmosphere and are scattered in all different directions.**

Scattering of Light

- **Clouds – large water droplets scatter all colors of light equally so they appear white**
- **Air molecules, nitrogen and oxygen, are so small that they scatter the smaller light waves more, so the sky appears blue.**
 - **Violet light waves are absorbed in the upper atmosphere**
- **Red, yellow, and orange light remain together, so when we look at the Sun, it appears yellowish white.**
- **Sunrises and sunsets – when the sunlight shines through the lower atmosphere, it passes through larger water molecules and dust particles, so the red, orange, and yellow light waves are scattered more.**