SUNLIGHT, SCATTERING, & POLARISATION

Have you ever wondered why the sky is blue? Well, it has to do with a phenomenon that allows Aweigh to function. When light leaves the sun, it is white light that travels through space relatively uninterrupted until it hits the Earth's atmosphere. Once sunlight hits the atmosphere, the light is scattered by molecules of air. This is scattering isn't just random, but can be described by something called Rayleigh Scattering.

Rayleigh Scattering is the elastic scattering of light (or could be other radiation) by molecules that are much smaller than the wavelength of the radiation. With regards to Aweigh, the radiation is sunlight and the molecules are the molecules of air. The intensity of scattering is inversely proportional to the fourth power of the wavelength. Mathematically described

$$I \propto \frac{1}{\lambda^4}$$

This relationship is important because it explains the question asked at the beginning. Sunlight, being white light, contains all colors of light, but different colors of light have different wavelengths. As blue light has one of the smallest wavelengths, it is scattered the most when sunlight hits the atmosphere. Hence why the sky is blue. Now, looking at all the different wavelengths of colored light, violet light actually has a shorter wavelength than blue, so why isn't the sky violet? White light isn't all the same, and the white light coming from the sun emits weaker violet light than blue. Additionally, human eyes are more sensitive to blue light.

This colouring of the sky due to Rayleigh Scattering also causes the polarisation patterns that allows Aweigh to find the user's position. Read more about these patterns and how Aweigh calculates longitude and latitude in our book provided.