***Rainbow***

The light is first [refracted](http://en.wikipedia.org/wiki/Refraction) entering the surface of the raindrop, [reflected](http://en.wikipedia.org/wiki/Reflection_%28physics%29) off the back of the drop, and again refracted as it leaves the drop. The overall effect is that the incoming light is reflected back over a wide range of [angles](http://en.wikipedia.org/wiki/Angle), with the most intense light at an angle of 40–42°. The angle is independent of the size of the drop, but does depend on its [refractive index](http://en.wikipedia.org/wiki/Refractive_index). Seawater has a higher refractive index than rain water, so the radius of a "rainbow" in sea spray is smaller than a true rainbow. This is visible to the naked eye by a misalignment of these bows.[[5]](http://en.wikipedia.org/wiki/Rainbow#cite_note-4)

The amount by which light is refracted depends upon its [wavelength](http://en.wikipedia.org/wiki/Wavelength), and hence its color. This effect is called [dispersion](http://en.wikipedia.org/wiki/Dispersion_%28optics%29). Blue light (shorter wavelength) is refracted at a greater angle than red light, but due to the reflection of light rays from the back of the droplet, the blue light emerges from the droplet at a smaller angle to the original incident white light ray than the red light. Due to this angle, blue is seen on the inside of the arc of the primary rainbow, and red on the outside.

The light at the back of the raindrop does not undergo [total internal reflection](http://en.wikipedia.org/wiki/Total_internal_reflection), and some light does emerge from the back. However, light coming out the back of the raindrop does not create a rainbow between the observer and the Sun because spectra emitted from the back of the raindrop do not have a maximum of intensity, as the other visible rainbows do, and thus the colors blend together rather than forming a rainbow.[[6]](http://en.wikipedia.org/wiki/Rainbow#cite_note-Zero_order_glow-5)

A rainbow does not actually exist at a particular location in the sky. Its apparent position depends on the observer's location and the position of the Sun. All raindrops refract and reflect the sunlight in the same way, but only the light from some raindrops reaches the observer's eye. This light is what constitutes the rainbow for that observer. The bow is centred on the shadow of the observer's head, or more exactly at the [antisolar point](http://en.wikipedia.org/wiki/Antisolar_point) (which is below the [horizon](http://en.wikipedia.org/wiki/Horizon) during the daytime), and forms a circle at an angle of 40–42° to the line between the observer's head and its shadow. As a result, if the Sun is higher than 42°, then the rainbow is below the horizon and usually cannot be seen as there are not usually sufficient raindrops between the horizon (that is: eye height) and the ground, to contribute. Exceptions occur when the observer is high above the ground, for example in an aeroplane (see above), on top of a mountain, or above a waterfall.