From the first moment the earliest scribe saw the rainbow in the sky while he was drying off the storm, people have been fascinated with prismatic effects.

But it wasn't until the middle 1600's (more than 300 years ago) that mankind began to understand rainbows and where they come from. In fact, it was probably Sir Isaac Newton who actually made the first prism discovery while he was a college student trying to solve the problem of early telescope lens making. Newton discovered that certain-shaped lenses (prisms) would produce a rainbow on the wall. He wondered if the prism changed white sunlight into a rainbow or if the rainbow was in the white light along.

Newton tried an experiment you can try. He covered the window in his room to darken it. He then cut a slit in the window cover to allow only a ray of light in. He held his prism in the light near the window and noticed the rainbow on the opposite wall. He concluded that white light is a mixture of all the colors and the prism separated them into red, orange, yellow, green, blue, indigo, and violet.

HOW? As the white light travels from the air to the prism, the light slows down as it enters the prism. If it enters the prism at an angle this slowing makes it change direction as well as speed. This bending (called refraction) is determined by the wavelength and the angle the light hits the surface of the prism. Each color has a slightly different wavelength so the colors are dispersed (bent) at different angles according to their wave lengths. The longer wavelength red rays are bent less than the shorter wavelength blue. It is possible to put another prism in the path of the colored rays in such a way that they will emerge from the second prism as a beam of white light and the light beam will have returned to its faster speed in air.

A rainbow happens in much the same way. You see a rainbow after a rain storm because the raindrops off in the distance act like your prism. Each raindrop reflects the sunlight into a rainbow which then reflects the colors back out of the drop to your eye.

Your Prism has another ability besides refraction. Although the Prism is perfectly clear because of the angles of light inside the Prism, it looks like the inside is lined with mirrors (this is called reflection).

Try this experiment: Hold the flat bottom of your Prism up to your eye and look through it like a telescope. You can see through the other end, but notice that the sides reflect mirror images of whatever is around you. Now turn the Prism around while still looking through it. See the images rotate and reflect in weird patterns like a kaleidoscope.

Because of the Prism's reflection ability, they are used today in telescopes, single lens reflex cameras, military sighting elements, and the like.

For more information on prisms, check the books in your local library. Look in the card catalog under 'Prisms', 'Light', or 'Lenses'.

TEDCO
Hagerstown, IN PIRA 6A44.67