

## Blue Skies

One of the most beautiful things about our world is a blue sky on a clear, sunny day. Maybe you have seen pictures of the Earth that the Apollo astronauts took from the moon? Even in bright sun the sky above them was black as night. What makes the difference? **Why is Earth's sky blue?**

Unlike the moon, the earth is surrounded by an **atmosphere**. The atmosphere is a mixture of gasses, mostly Nitrogen and Oxygen. The way the atmosphere interacts with the sun's light is what determines the color of the sky.



**Light** is made up of several different colors, like you see in a **rainbow**. Each of these colors travels in a wave, but the **wavelength** (distance between the peaks of a wave) varies.

- **Red light** has a long wavelength,
- **Blue light** has a much shorter wavelength.

When light from the sun enters our atmosphere, the waves collide with the gas molecules. The longer wavelengths, like **red** and **yellow**, pass straight through and appear to us as "regular" sunlight. Shorter wavelengths, like **blue**, are scattered in different directions by the gas molecules. The **blue light** is scattered by the gas molecules, **so our sky looks blue**.



## Explore, Play, & Discover at Home!

1. Make **Blue Skies** with Water, Milk, & a Flashlight
2. Skittles **Rainbow**



# Blue Skies

You can see some light scattering by mixing half a teaspoon of **milk** with a jar of **water**. Shine a **flashlight** through the jar and look at the water. It should have a **bluish** tint, because the milk particles are scattering the **blue light** from the flashlight just like the gas molecules in our atmosphere do.



**Blue** sky isn't the only beautiful thing produced by the atmosphere and light. Colorful **sunsets** happen because of light scattering, too! When the sun is on the horizon, its light has to travel through a lot more atmosphere to reach you.

The **blue light** is scattered so much in the extra atmosphere that it doesn't reach your eye, leaving you to see the beautiful **reds** and **oranges** instead. Sometimes clouds or air pollution can make a sunset even more **red** because the particles in the cloud help scatter away the shorter wavelengths.



 Add a little more milk to your jar – do the extra milk particles allow you to see an **orange** tint? Try looking in the side of the jar directly opposite where the flashlight is.

This is like looking at the sun on the horizon.

## Make a Rainbow

Place your **Skittles** in a circle around your **dish**. Once you have completed the circle add in **medium temperature water** in the middle. Make sure you add enough to go right to the edge of the candy on both sides. Wait thirty seconds to see the colors begin to come out. The color will start dissolving away from the shell once you add in the warm water... and make a beautiful, full-circle rainbow!

