

## Support Materials for Fireworks 360

**Objective:** The learner will describe how fireworks work.

### **Background Reading:**

Fireworks light up the night sky with dazzling displays of color, sound, and explosive effects. Everyone enjoys watching a fireworks show. But how do they work?

Fireworks are the result of chemical reactions. The main part of the firework is the shell, which contains black powder, a type of gunpowder. The black powder is surrounded by small pellets called stars, most often containing metal salts of different kinds. When the black powder is ignited, the lift charge launches the shell into the air. Then, when the firework reaches a certain height in the air, the burst charge is activated. The stars within the firework explode blast outward, resulting in an exciting display of light, color, and sound.

Fireworks are different colors because of the different kinds of metal salts they use. Copper, for example, burns a bluish-green color. Strontium burns red, calcium chloride burns orange, and sodium salts burn a deep yellow color. Other chemical compounds cause special light effects such as strobing or sparkling. Still other chemical compounds can cause sound effects such as whistling or popping.

Fireworks have been around for a long time. Historians believe that fireworks were invented before true gunpowder was. So, the first “firearms” actually hurled flaming materials. The Chinese have set off fireworks for centuries, and by the 1600s fireworks were widely used in England and France. Besides being used for entertainment, fireworks, flares, and rockets are also used for safety, communication, and warfare.

Learn more at <https://www.ontariosciencecentre.ca/science-at-home/diy-science-fun/the-science-of-fireworks>

### **Discussion Questions:**

- How do the fireworks in the video operate?
- Why is there a time gap between when the fireworks are launched and when you see the explosion?
- What creates the different colors and formations of the fireworks you see in the video?