

Spark Art

The Action

Students will see a blank piece of paper become a work of art using sparks.

Grade Level

Grade 10 - Physical Science and Chemical Change

Materials

- Potassium or sodium nitrate
- Small beaker and a glass stirring rod
- Thin paint brush
- Paper
- Matches
- Wooden splint

Instructions

- Make a saturated solution of sodium or potassium nitrate and water (excess crystals in the bottom of the beaker). There only needs to be 20 mL, or so, of water because the solution goes a long way.
- Apply the solution to the paper using the paintbrush. Try to have a medium size line so that the spark can move quickly around the picture. Draw an animal or words such as "Science", but be careful how you draw the letters.
- When the paper is nearly dry, mark lightly, with a pencil, where the drawing has begun.
- Show the students the paper, and then tell them you can draw magically with fire. Light a match and then light a wood splint. Blow out the flame and allow the red ember to remain. Touch the ember to the pencil mark and watch your spark art take off.

Safety

- Care must be taken when handling the chemicals and when striking the match. When starting the spark on the paper, make sure the flame on the splint is out and only a red ember remains.
- There is a rather strong smoke present so it may be wise to complete this experiment in a well-ventilated area.

Hints

Use paper that will easily soak up water; clear newsprint works well.

Science Principle

The water in the supersaturated solution evaporates off the paper, leaving the nitrate behind on the paper. Potassium and sodium nitrate are strong oxidants. The glowing tip of the splint supplies the initial energy needed to activate the release of oxygen from the nitrate. The oxygen, as it is released throughout the reaction produces the burning glow that you see. This is an exothermic reaction, which means it releases heat energy. This heat energy keeps the reaction going, by releasing more and more oxygen from the nitrate (or potassium). The reaction follows the path of the nitrate (or potassium) along the paper and by doing so, it creates the image that you originally painted.