Make Your Own CO2 Fire Extinguisher

Special Interest Areas

ADVENTURE & SPORT
ARTS & LITERATURE
CREATING A BETTER WORLD
ENVIRONMENT
GROWTH & DEVELOPMENT
STEM & INNOVATION

Sections

Joey Scouts
Cub Scouts
Scouts
Venturer Scouts
Rover Scouts

SPICES Growth Areas

SOCIAL
PHYSICAL
INTELLECTUAL
CHARACTER
EMOTIONAL
SPIRITUAL

Challenge Areas

COMMUNITY
PERSONAL GROWTH
OUTDOOR
CREATIVE

Scout Method Elements

COMMUNITY INVOLVEMENT
LEARNING BY DOING
NATURE AND THE OUTDOORS
PATROL SYSTEM
PERSONAL PROGRESSION
PROMISE AND LAW
SYMBOLIC FRAMEWORK
YOUTH LEADING, ADULTS SUPPORTING

Scouts VICTORIA

The Adventure

With your patrol or unit, learn about fire and ways to put out fire by creating your own carbon dioxide fire extinguisher.

Plan

1. Investigate fire and what it needs to burn. What effect does removing one of these elements have?
2. Investigate common types of fire extinguishers including how they work, why there are different types of fire extinguishers, and what types of fire would you use them for.
3. Investigate carbon dioxide (CO_2) including what it is, some of its properties and hazards, and how it interacts with oxygen. How does carbon dioxide effect our environment?
4. Investigate the chemical that primarily makes up vinegar and bicarbonate of soda and how they might react.
5. Read the safety information and discuss with your leaders or another appropriate adult what safety equipment, precautions, and supervision may be required. Ensure that you have these safety measures in place before starting the ‘Do’ section. A risk assessment should also be completed.

Do

1. Make sure everyone knows the safety requirements and are wearing correct protective equipment.
2. Into a small jar or container, add approximately 5 mL of vinegar.
3. Add a quarter of a teaspoon of bicarbonate of soda to the jar and immediately place a lid over the jar.
4. Briefly, observe the reaction that occurs and then light a tea candle with matches.
5. Remove the lid from the container and gently pour the GAS onto the flame. Be careful to make sure that you do not pour the liquid on the candle.
6. Observe what happens to the flame.

Review

1. Did the reaction occur as you expected it to? Why or why not?
2. Did the gas react with the flame as you expected it to? Why or why not?
3. What did you enjoy most about this activity? What did you learn?
4. What do you think would happen if we used more or less of either ingredient?
5. When pouring the jar, it is important to only pour the gas. Why do you think this is?

Safety

- Fire hazard: This activity uses flames and therefore there is a burn risk. Adult supervision is required.
- Be careful that the amount of vinegar is somewhat relevant to the size of the jar. You need enough room for carbon dioxide to be produced without creating too much pressure.
- Carbon dioxide is colourless and odorless. This means that you won’t be able to see it coming out of the container or be able to smell it. Carbon dioxide is also hazardous to human health.
- Consider section appropriateness when deciding if this should be done as a demonstration or a participation activity.

Variations

- This challenge card can be paired well with other fire-based challenge cards – such as ‘Candle Chemistry’ - and ‘Hydrogen gas production’ to create a longer program.