# Elephant's Toothpaste

## Sections

Joey Scouts
Cub Scouts
Scouts
Venturer Scouts
Rover Scouts

Scouts VICTORIA

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## Challenge Areas

COMMUNITY
CREATIVE
OUTDOOR
PERSONAL GROWTH

## Scout Method Elements

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

## SPICES Growth Areas

CHARACTER EMOTIONAL INTELLECTUAL PHYSICAL SOCIAL SPIRITUAL

# The Adventure

Humans need to brush their teeth to keep them healthy. So do elephants. Whilst this challenge card won't create something that you can actually brush an elephant's teeth with, it will create what something like this might look like.

# Plan

1. Investigate different methods for elephant's toothpaste. Do they differ? If so, how? Which one do you think would work best? Some you might like to look at are https://www.scientificamerican.com/article/make-elephant-toothpaste/ and https://www.questacon.edu.au/outreach/programs/science-circus/videos/elephants-toothpaste
2. Investigate some common uses and sources of the key ingredients, including what their chemical formulas: hydrogen peroxide, yeast, dishwashing liquid, and water. Investigate and hypothesis what role the water temperature might play in the reaction.
3. Investigate what reaction is occurring when the ingredients are mixed together and why.
4. 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.
5. Choose an appropriate location to complete this experiment as it may get messy.
6. Gather the equipment and ingredients needed to make your elephant's toothpaste. You will need the following: a satchet of yeast, warm water, a plastic bottle, a funnel, dishwashing liquid, food colouring, measuring spoons, measuring cup, hydrogen peroxide (at least 6%), and a catchment container.

# Do

1. Make sure everyone knows the safety requirements and are wearing correct protective equipment. Make sure that you also have a tray to catch the reaction in.
2. With your patrol, create elephant's toothpaste using a method that you have found, or the method outlined below:
   a. In a small cup, mix 4 tablespoons of warm water with a sachet (~7g) of dry yeast, stirring for about 30 seconds.
   b. Transfer the yeast mixture to a plastic bottle. You may need a funnel to assist you with this.
   c. Add approximately one tablespoon of dishwashing liquid to the plastic bottle.
   d. Add about 5 drops of food colouring, if desired, to the plastic bottle.
   e. Measure 40 mL of 6% hydrogen peroxide using a measuring cup, and pour hydrogen peroxide into the bottle.
3. Once the reaction has finished, while wearing gloves, carefully touch the side of the plastic bottle. What do you notice about it?
4. Record your results and any variations to the instructions.
5. The methods presented in the links in the 'Plan' section vary in the concentration of hydrogen peroxide used. Try the experiment again using 3% hydrogen peroxide. What happens? How does it differ? What about 12% hydrogen peroxide?

# Review

1. Did your experiment go as expected? Why or why not?
2. What did you enjoy the most from this experiment? What did you learn?
3. If you were to do this activity again, what would you do the same? What would you do differently?

# Safety

- Hydrogen peroxide is a dangerous chemical. The concentrations used in this experiment can be purchased from chemists, however, this does not make it not dangerous. Personal protective equipment – gloves, safety glasses, and lab coats – should be warn when handling chemicals. Make sure to have a read of the safety data sheet for hydrogen peroxide.
- This reaction is exothermic and produces heat. Be careful when handling containers after use.
- This activity can get quite messy so it is best to be done outdoors and to limit chemical risk, in a well ventilated area.
- Some people might have allergies or sensitivities to different chemicals. Check before you start whether anyone has known allergies you need to be aware of. Make sure there is an adult prepared to provide First Aid if anyone does have an unexpected reaction.
- A scout cares for the environment. Make sure to dispose of chemicals safely and appropriately.

# Variations

- Whilst this activity is designed for Scout sections (with supervision) and upwards, it can be done as a demonstration by adults for Joeys and Cubs.
- If you are wanting single colour foam, try mixing the food colouring into the hydrogen peroxide and dishwashing liquid mixture whereas, if you are wanting classic toothpaste stripes, drip the food colouring down the sides of the bottle and do NOT mix in.
- Elephant's toothpaste can also be done with higher concentrations of hydrogen peroxide and potassium iodide or manganese oxide instead of yeast, all of which are specialist items which can be purchased from chemical suppliers.

These chemicals are more dangerous and may be hard to obtain but produce a much more impressive result.