How Soap Really Works

Science Film Festival
Knowledge Through Entertainment

FILM

House of Little Scientists: How Germs Spread

KEY OBJECTIVES

1. **To understand how soap works to get rid of germs**

INTRODUCTION

Parents and teachers know the struggle of trying to get children to clean their hands. It's just not that easy to explain to them what germs are and how they work. This simple and fun activity is a unique way to get the point across and to help children learn about the best way to prevent the spread of germs and viruses.

GUIDING QUESTIONS

- What happens to the pepper when we drop soap in the bowl?
- What happens if we use more/less pepper?
- What happens to the pepper if we put more/less soap?
- Why do you think the pepper moves when we put soap in the bowl?
- What happens to the pepper if we use different kinds of soap (bubble bath, bar soap, hand soap etc.)?

MATERIALS/PREPARATION

- 2 Shallow Bowls
- Water
- Pepper
- Dish soap

TOPICS
Hygiene | biology | health

KEYWORDS
Germs | surface tension | molecules | hydrophobic | dissolve

LEVEL
Early learner

RESOURCE TYPE
Experiment

INTENDED AUDIENCE SIZE
Small Group

MODE OF DELIVERY
Live Online

TIME FOR ACTIVITY
20 min.

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TASKS/PROCEDURE

1. Fill one of the bowls with a thin layer of soap. In the second bowl, fill it with water and sprinkle pepper across the surface of the water of one of the bowls in a thin layer. As you do this, explain that in the bowl the pepper represents the germs.

2. Ask the children to dip a finger in the bowl. Ask all children if they noticed if the germs moved. The black pepper will stick to their finger tip. Ask the children to look at their fingers. Ask them if there are germs on their finger.

3. Ask the children 'what should we do when there are germs on our fingers?', and get them to dip their finger in the bowl with the soap.

4. Ask them to dip their finger back into the bowl with the pepper. The pepper will magically move away from the soapy finger. Ask them if they noticed the germs move. Ask the children if there is pepper (or 'germs') on their finger.

FOSTERING DISCUSSIONS

The behavior of the pepper is directly related to the surface tension of the medium you are putting the pepper into. Pepper is hydrophobic or doesn't dissolve or mix into water. Since water molecules are strongly attracted to each other, or have a high surface tension, it keeps the pepper afloat. Adding soap breaks down the surface tension and as the water molecules spread out away from the soap, they bring the pepper with them. The less pepper you use, the farther the pepper is able to spread. This is the same way that microscopic particles would behave in water when you are washing your hands with soap vs. just washing with just water.

SAFETY INSTRUCTIONS

Remind the children to be careful not to inhale or get the pepper into their eyes

AUTHORS AND SOURCES

Submitted by Discovery Centre Kenya

- www.himama.com/daycare-activities/pepper-hand-washing
- wcyb.com/weather/weather-why/popular-popular-science-experiment-explained-why-does-soap-repel-pepper-in-water