

Soap, Water, and Pepper experiment (10 mins)

**Curriculum Links (KS1 and KS2):**

**Science:** Working scientifically; Living things and their habitats

**English:** Reading and Comprehension

**PSHE:** Core Theme 1 - Health and Wellbeing

**Design and technology:** Cooking and nutrition

**Art and design:** Painting; recording observations

**Learning Objectives for KS2:**

**All students will:**

- understand that infection can be spread through unclean hands.
- understand that handwashing can prevent the spread of infection.

**Most students will:**

- understand when and how to wash hands.

**Some students will:**

- understand why we should use soap to wash our hands

**Risk Assessment:**

*In the event of an outbreak of infection you may need to modify this activity to ensure social distancing or other criteria according to your school's policy. Please email the e-Bug team at [e-Bug@phe.gov.uk](mailto:e-Bug@phe.gov.uk) if you wish to discuss ideas or modifications to this activity that are needed to follow guidelines in your setting.*

This activity is suitable for KS1, KS2 and community groups, and involves the use of a hand soap dispenser, pepper, and water to demonstrate why we need to use soap to wash our hands and why water alone is not as effective. It is outlined in the "[Horrid Hands](#)" section of the KS1 lesson pack and the [Beat the Bugs](#) pack.

**Before you begin you will need:**

- Small bowls with water
- Fine ground black pepper
- Hand soap dispenser or a bowl of hand soap
- Cocktail sticks (optional) or your finger
- A towel
- A pen
- A notebook
- A camera (optional)



**Use the following steps as a guide to implement this activity:**

- Set up the activity by filling a bowl with water and sprinkling pepper on the surface. The pepper should float to the top.
- The surface of the water in the bowls represents your hands.
- The pepper represents dirt and harmful microbes that need to be washed away.
- Dip the end of a cocktail stick (or your finger) into a plain bowl of water and then into the pepper water. Explain to the group that this shows that when we use water alone to wash our hands, this only moves the microbes around, it doesn't remove them. You can take a photo to record what has happened.
- Dip the cocktail stick (if using one) into a bowl of hand soap and then into the pepper water. Alternatively, squirt some hand soap into the pepper water directly from the dispenser. You can take a photo to record what has happened.
- The pepper "microbes" will move towards the edges of the bowl as the soap hits the surface of the water.
- Discuss with the participants what happened with and without the soap, use the photos, if taken, to explain what happened.
- When you dip your dry finger into the water nothing really happens, you just move the dirt (pepper) around your hands (the bowl).
- Explain that when the soap was on your finger, or on the cocktail stick dipped into the pepper water, the dirt (pepper) should have moved towards the edges of the bowl. This is because the soap removes the oils on your hands and the oil pushes the pepper towards the edge of the bowl.
- Microbes like to stick to the oils on your hands, which is why we wash our hands with soap. Without soap, the oils are not removed, and microbes find it easier to stick!

**Use the discussion questions to check participant's understanding after the activity is completed. Then complete action plan (Beat the Bugs).**