Can soap move pepper?

Ages 5–7 with a grown-up · 5–10 minutes · Compare two touches

https://kiddos.ai/explorations/learning-with-gina-and-ollie/can-soap-move-pepper

Wonder together

Stay or scatter? The pepper rests on water. What will a touch of soap do?

Materials

A clean shallow plastic bowl, water about 1 cm deep, a small pinch of ground pepper, ordinary dish soap and two cotton swabs.

Adult setup — read before trying

An adult handles pepper and soap and follows the soap label. Sprinkle close to water away from faces; do not blow/sniff. Skip if pepper irritates anyone. Keep materials out of eyes/mouths, no tasting. Protect surface; wash hands, clean equipment and empty water afterward.

Try together

1. Adult adds room-temperature water about 1 cm deep to the clean shallow bowl. Let it settle, then lightly scatter a small pinch of pepper close to the surface and away from faces.

2. Touch the middle gently with a clean, water-wet swab. Do not stir. What happens?

3. Use a fresh swab with a tiny dab of dish soap. Touch the middle gently.

4. Rinse well. Start again with fresh water, pepper and fresh swabs.

Keep the comparison clear

Keep fixed: Bowl, settled water and a similar gentle touch without stirring.

What changes: A water-wet swab is followed by a fresh swab with a tiny soap dab.

Look for: Watch pepper move outward and a clearer central patch appear.

Explain with care

Soap locally lowers surface tension. The surrounding surface pulls more strongly, causing flow that the pepper helps make visible.

Pepper is not fleeing, becoming germs or disappearing. Some plain-water movement is possible. Soap residue weakens a repeat: rinse and use a fresh setup.

Talk about it

Stay or scatter? The pepper rests on water. What will a touch of soap do?

Answer cue: Welcome a guess before reading the result. No correct prediction is required.

Where did pepper move after the soap touch?

Answer cue: Much of it can move away from the soapy area; some specks may remain.

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Is this a demonstration of germs running away from soap?

Answer cue: No. It shows a physical effect at the water surface, not a model of handwashing.

A parent move: Ask what moved before offering an explanation for why.

Start simply: Adult performs both touches while the child watches or describes the clearing.

Explore further: Rinse thoroughly and repeat with fresh water, pepper and swabs.

Return to it: Ask whether the pepper vanished or simply changed position.

In the classroom

Flexible 20-minute small-group session; pause or shorten as needed.

3 min · Wonder

Read pages 1–2. Invite a prediction with words, pointing or a sketch; keep the result hidden.

4 min · Notice the story

Read pages 3–5. Where did pepper move after the soap touch? Separate the observation from the explanation.

9 min · Try together

Use the materials and adult setup on this guide, then follow the activity steps in this guide. Watch pepper move outward and a clearer central patch appear.

4 min · Make meaning

Is this a demonstration of germs running away from soap? Invite a drawing, a description or an adult-written note. Ask what moved before offering an explanation for why.

Understanding check

Is this a demonstration of germs running away from soap?

Answer guidance: No. It shows a physical effect at the water surface, not a model of handwashing.

Participation choices: Adult performs both touches while the child watches or describes the clearing. Accept pointing, words, a drawing or adult-directed action. Use the story alone if the activity is unsuitable.

Words to explore

surface — The top of the water.

surface tension — A pull along a liquid's surface caused by attraction between its molecules.

Full adult notes and honest limits

Prepare together. Use a clean shallow plastic bowl, room-temperature water about 1 cm deep, a small pinch of ground black pepper, ordinary liquid dish soap and two cotton swabs. An adult handles pepper and soap, follows the soap label, and stays beside the activity. Sprinkle gently close to the water, away from faces; do not blow or sniff the pepper. Skip pepper if it irritates anyone or is unsuitable for them. Keep swabs, soap and pepper away from eyes and mouths. Do not taste. Protect the surface, wipe spills, wash hands and clean the bowl afterward. No glass, sharp sticks or heat is needed.

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Test one change. Let the water settle, then add a light scattering of pepper. Ask for a guess before soap is added. First, wet a clean swab with plain water and gently touch the center without stirring. A few specks may shift or stick to the swab. Keep the bowl, water and gentle touch the same. An adult puts a tiny dab of dish soap on a fresh swab; touch the center again and watch right away. A clearer central patch can appear as pepper moves outward. Exact speed, shape and remaining specks vary. Do not describe the plain-water test as perfectly motionless or promise a flawless empty circle.

Understand the change. Water molecules attract one another, producing surface tension. Soap reduces that tension locally. The surrounding surface has a stronger pull, driving surface flow away from the soapy area; floating pepper makes that flow visible. Pepper does not run away by itself, dissolve instantly or disappear. The water remains in the bowl. This is a physical surface effect, not a model showing germs escaping soap or proof of how handwashing removes germs.

Try again thoughtfully. Soap residue can weaken the next result. Rinse the bowl thoroughly, use fresh water and pepper, and use fresh swabs. Start again if the water was already soapy, the pepper layer was too thick or the swab stirred the water. Keep the first and second touches gentle and similar; change only the soap. Do not keep adding more soap to a used bowl expecting the same sudden movement. A child can predict, point, draw before and after, describe the cleared area, or direct the adult; touching the materials is optional.

Share or read on. For a small group, use one supervised fresh setup per turn. Invite each child to describe what changed before naming surface tension. No exact pepper count, color naming, timed performance or winning guess is needed. Where Did My Water Go? follows Gina and Ollie through a separate water-cycle story; it does not contain this soap experiment. These illustrations and diagrams are editorial examples. No live family trial or measured learning improvement is claimed.

Related reading

Where Did My Water Go? explores the water cycle; this surface-tension activity is separate.

Scientific sources

fleet-pepper-and-soap — https://www.fleetscience.org/activities-resources/pepper-and-soap

acs-ed400316a — https://pubs.acs.org/doi/10.1021/ed400316a

csu-magic-pepper — https://garfield.extension.colostate.edu/wp-content/uploads/sites/43/2025/12/Surface-Tension-Magic-Pepper-Experiment.pdf

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