

The logo features the word "DIY" in a large, bold, white, distressed font. Below it, the words "LAKE SCIENCE" are written in a smaller, white, sans-serif font inside a white rectangular box.

**DIY**

**LAKE SCIENCE**

The background of the entire page is a teal-tinted photograph. It shows a person's hand holding a pair of tweezers over a shallow dish of water. Several water bugs are visible on the water's surface, with one being held by the tweezers. The scene is dimly lit, focusing on the experiment.

# **WATER BUGS**

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**HOW DO POLLUTANTS AFFECT AQUATIC BUGS?**

## ACTIVITY DESCRIPTION

You may have seen bugs walk on the surface of a lake, stream, river, pond or ocean. Why don't these bugs sink under the water's surface? In this activity, you'll learn about surface tension of water and how different substances affect it.

Age: 9 and up

Preparation: 5 minutes

Activity: 10 minutes

Cleanup: 5 minutes

## ACTIVITY MATERIALS

- 4-6 small metal paper clips, 2.5-3.5 cm long
- 3 bowls or wide-mouthed containers
- Water
- 1 handful of dirt, sand, or coffee grounds
- Spoon
- Liquid dishwashing detergent or liquid hand soap



## MATERIALS NOTE

Do not use large or “jumbo” paper clips, or paper clips with ridges. Smooth, metal paper clips, 2.5-3.5 cm long work best. Bowls or containers can be anywhere from 250 mL (1 c) to a few liters, and must be very clean.

## SAFETY

If you extend the activity to test any substance that is not safe to eat, be sure you do NOT use bowls or containers that will later be used for eating or holding food. Get an adult's help to choose additional substances to test.

## STEP 1

Wash or wipe your bowls or containers so they are very clean, and fill them with water almost to the brim. These represent lakes or other bodies of pristine, clean water.



## STEP 2

Bend all your paper clips into a triangle with a handle pointing upwards, as shown in the picture. These paper clips represent bugs that can float on top of water in lakes, streams, rivers, ponds and oceans.



## STEP 3

Holding the paper clip's bent end as a handle, slowly lower each paper clip onto the water's surface. The paper clips should float on the surface, just like a water bug!



## STEP 4

Do you think water bugs can float on water that has dirt or sand in it? To test this, first remove the paper clips from the water. Add a spoonful of dirt to one bowl of water and mix gently. Try to float 2-3 paper clips on the water's surface. Do your paper clip bugs float?

*Tip: Don't have sand or dirt? You can use coffee grounds instead.*



## STEP 5

Do you think water bugs can float on water that has other substances in it? To test this, float 2-3 clean paper clips on the surface of water in a different bowl. Add a small amount of liquid detergent or soap to your fingertip and place that fingertip into the water. Do the paper clips still float?



## WHAT'S GOING ON?

Aquatic bugs can float because of a property of liquids called surface tension. In some liquids like water, the upper layer's liquid particles or molecules form a tight connection. Small, light objects (like paper clips and bugs) can rest on this top layer of water molecules without sinking below the surface. This is different than a bird or boat floating in water, partly submerged.

Some substances like soap or detergent can weaken water's surface tension, causing the paper clips to sink. Other substances like dirt and sand do not affect surface tension. A paper clip or bug can float on murky water just as well as on clean water.



Bugs can float on the surface of water due to a property of liquids called surface tension.

## WATER SURFACE HABITAT

Some aquatic bugs like water striders depend on the water's surface for their habitat. They often eat other insects that fall onto the water's surface from the air or nearby plants. If pollution decreases the water's surface tension, water striders cannot live or feed there. Animals like birds and fish that eat water striders will also have a harder time



finding food. Instead of pollution making animals sick, pollution changes a property of water in this case—surface tension—that some organisms rely on.

## LEARN MORE |

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## CREDITS |

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This activity from the DIY Lake Science app allows families to investigate and learn about lakes and bodies of water at home or on the go! The app features twelve hands-on investigations, as well as videos and a lake simulation.

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