**Water and surface tension**

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**Aim**: explore water and the concept of surface tension i.e. things (e.g. some insects) can float on the surface of the water even if their density is higher than that of water (e.g. paperclips are denser than water).

**Age**: 6+

**Complexity**: moderate to high. This experiment requires careful placing of a paperclip on water and washing-up liquid so parental/carer supervision is probably required.

**Cost**: £5

**Location**: suitable to be done at home.

**Materials & Equipment**

* Tap water
* Small jar of washing-up liquid (or baby shampoo to decrease risk)
* Paperclips (2)
* Blunt tweezers
* Shallow bowl (intended water layer 1 inch thick)
* Measuring jug (to pour the water)
* Optional: food colouring (three colours)

**Outline:**

1. Fill a shallow bowl with a roughly 1-inch layer of water.
2. Use tweezers to gently lower a paperclip into the water vertically: it should sink – so clearly the density of the paperclip is larger than that of water.
3. Use tweezers to gently lower a similar paperclip into the water horizontally (see video): it should float.
4. With the paperclip floating, gently add some washing-up liquid to the water: this can be done by dipping a cotton swab in some washing-up liquid and then gently touching the water surface with it: the paperclip should sink.
5. Optional: use milk instead of water and add three drops of different food colourings to the water, close to each other, and then touch the cotton swab with the washing-up liquid in the middle of those three drops – see these links for the intended effect:
   1. https://www.acs.org/content/acs/en/education/whatischemistry/adventures-in-chemistry/experiments/colors-move.html
   2. https://www.science-sparks.com/surface-tension-of-water/

**Learning outcomes:**

- Explore an important property of water: relatively high surface tension.

- Link surface tension to the behaviour of some insects.

- Explore how soap-like molecules affect surface tension.

**RISK ASSESSMENT (PTO)**

**Adult supervision is required for any experiment!**

Overall, this is a fairly safe experiment, but ingestion of washing-up liquid should be prevented!

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| HAZARD | Likelihood and Seriousness of Injury | Control Measures | Remaining Risk |
| Ingestion of washing-up liquid | Medium | Appropriate age group and/or parental supervision | Low |
| Ingestion of small object (paperclip) | Medium | Appropriate age group and/or parental supervision | Low |

**First Aid: this experiment uses household products; in the case of ingestion, follow package instructions.**

**Remember - never do experiments alone!**