**Soap-propelled boats**

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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**: 5+

**Complexity**: this experiment requires an adult to cut a cardboard 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)
* Shallow bowl (intended water layer 1 inch thick)
* Soap or washing liquid
* Pepper or glitter
* Thick cardboard
* Cotton swab

**Outline:**

Experiment 1:

1. Fill a shallow bowl with a roughly 1-inch layer of water.
2. Sprinkle some pepper or glitter on the surface of the water
3. Dip a finger in soap or washing up liquid, and then in the water. The pepper/glitter with “run away” from the finger.

Experiment 2:

1. Fill a shallow bowl with a roughly 1-inch layer of water.
2. Cut a piece of cardboard in the shape of a chevron (or an even better shape, shown here: <https://www.youtube.com/watch?time_continue=148&v=qz9hkWhZfRM&feature=emb_logo>
3. Add the cardboard in the water so it floats
4. Dip the cotton swab in soap, and then behind the boat (“inside the chevron”)

**Learning outcomes:**

- explore an important property of water: high surface tension. Explore how soap and water differ.

**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 (cotton swab) | 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!**