Champion
the Researchers

BIOFOULING

Maria is a biologist and a marine engineering researcher. She works on remedies to biofouling; the adhesion of marine life such as algae and mussels to surfaces in the water. This can be a serious problem in the fishing and shipping industries. When nets get covered in marine life, fewer fish get caught in them. When boats get covered in marine life, they can't move as fast through the water. Ships affected by biofouling get through more petrol, which increases pollution levels in rivers and seas.

PUPILS DESIGN AND CARRY OUT EXPERIMENTS AROUND BIOFOULING

Equipment

Four clean glass jars per group; aluminium foil; plastic sheet (such as acetate); greaseproof paper; balsa wood sheets; access to pond water; multi-purpose fertiliser (or plant food)

Method

Collect about one litre of pond water; try to get some with a bit of algae already growing. Add some of the pond water to each jar – try to put the same amount of water in each one. Add about a teaspoon of fertiliser to each one and gently shake to mix.

Cut out same-sized strips of the different materials – foil, plastic, paper and wood – and place one in each jar. Put the jars (without lids) in a light place (for example, on a windowsill) for between 10 days and two weeks, or until you can see algae in at least some of the jars.

Take out the materials and see which material accumulated the most algae, and which material accumulated the least algae.

Extensions

Repeat the experiment but coat the materials in, for example, oil, Vaseline or paint. What effect does this have on the amount of algae that accumulates on the materials?

The same experimental set-up could also be used to determine the optimum amount of fertliser to use to grow algae (for use as a biofuel), or to investigate the effects of sunlight on algae growth.

The research link

The algae represents a whole host of micro-organisms that can adhere to the side of boats. The different materials represent boat bottoms made from different materials and, in the extension, the oil/Vaseline/paint represent coatings used to reduce adhesion to boat surfaces. Sharks use a mucous coating to minimise biofouling on their skin, which is an example of biomimetics.

Additional guidance notes

Make sure pupils are supervised and follow school guidance when collecting pond water. Always do a risk assessment before carrying out practical work.

Here is a **video** illustrating biofouling.

Information on using microbes in the classroom can be found **here** and **here**.

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Champion the researchers is a 4science project funded by The Royal Academy of Engineering
