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NEWS PHYSICS

Physicists have found a way to foil a classic oobleck science trick

The cornstarch and water mixture solidifies under impact. A new technique makes it stay liquid

Runners can cross a liquid mixture of cornstarch and water, which solidifies when hit by footfalls. But now scientists have discovered a way to sink such runners.

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By Emily Conover

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It takes guts to attempt running across the surface of a liquid. Even more so if a sneaky physicist is nearby.

A mixture of cornstarch and water known as oobleck solidifies when hit with a forceful impact. That effect makes for a classic science party trick, in which participants run across the liquid's surface (*SN: 7/16/12*). But a new technique could sink those runners, researchers report May 8 in *Science Advances.*

The next step, she says, is to try the technique on a larger scale, in hopes of foiling would-be runners.

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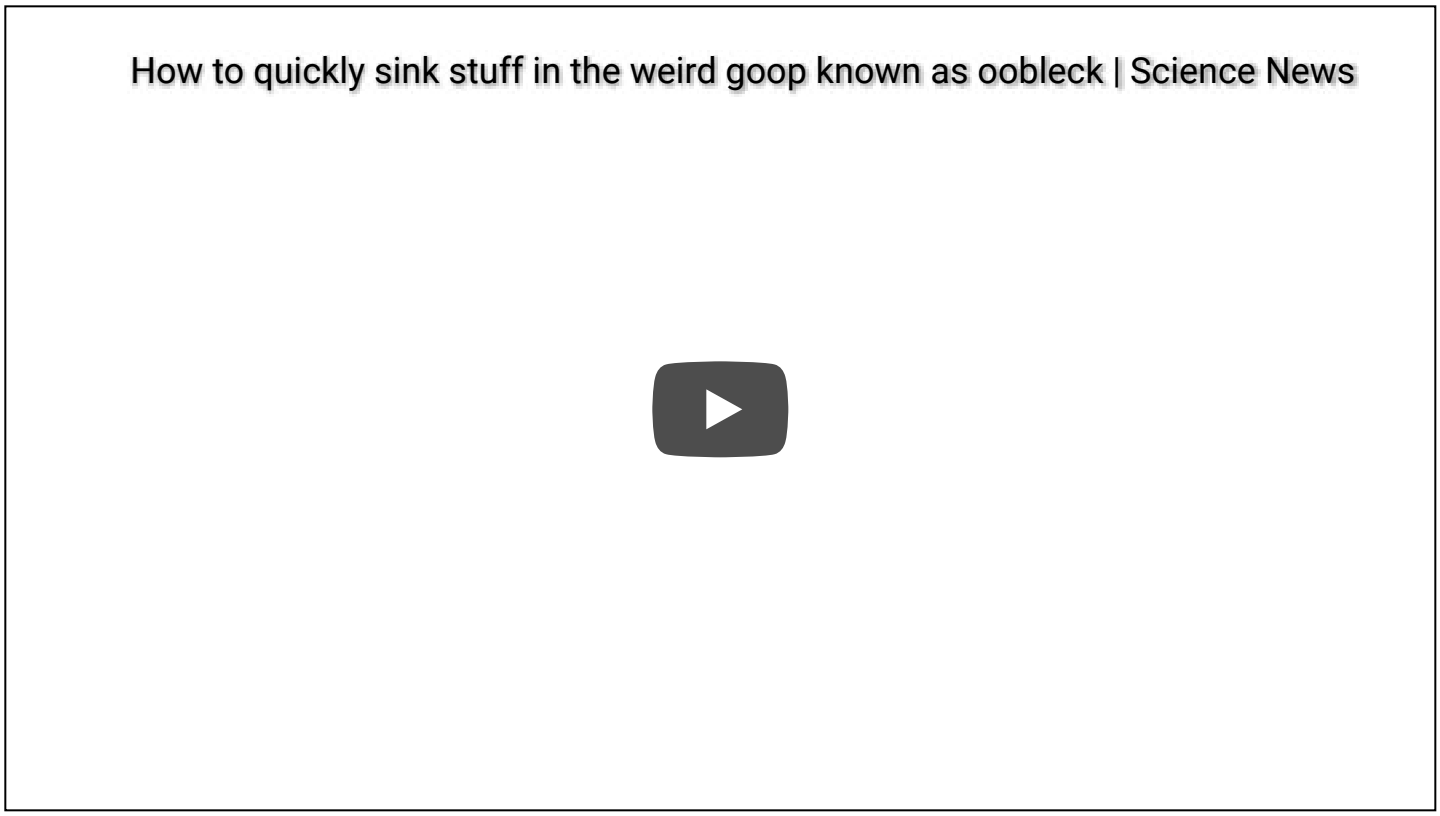
CITATIONS

R. Niu et al. Tunable solidification of cornstarch under impact: How to make someone walking on cornstarch sink. *Science Advances*. Published online May 8, 2020. doi: 10.1126/sciadv.aay6661

Oobleck is a non-Newtonian fluid, meaning that its viscosity changes depending upon the forces exerted on it. Other non-Newtonian fluids include ketchup and frog saliva (*SN: 1/31/17*), both of which get thinner with applied force, in contrast to oobleck.

In laboratory experiments, a cylinder dropped onto the surface of oobleck sank more quickly when researchers rapidly rotated the mixture's container clockwise and counterclockwise. Normally, the impact of the cylinder would cause particles of cornstarch to come into contact with one another, jamming up into a solid. But by oscillating the container, "you basically move the particles so they are no longer in contact, and this makes it liquid again," says physicist Meera Ramaswamy of Cornell University.



In response to an impact, a mixture of cornstarch and water thickens into a solid. So a cylinder hitting the surface of that mixture sinks slowly. But when the container is rotated back and forth, it essentially reliquifies the mixture and the cylinder sinks more quickly. The same technique could be used to foil a classic physics demo: people running across the surface of the liquid.

The same effect, Ramaswamy and colleagues say, would sink a foot impacting the surface of oobleck in a rotating tub. It could also be useful in industrial processes involving similar fluids, for example, preventing clogs in tubes that carry cement.