

Soliquid

Demonstrating two fascinating phenomena namely shear-thinning and shear-thickening by using daily life matters for the younger generation to explore the fun part of materials science and engineering

Lab (1) - Newtonian fluids

- Pour 50g water and oil into two plastic bowls using the same bottle and record the time needed.



Items:

- During activity

- Water
- Honey
- Oil
- Cornstarch
- Ketchup
- Bowls
- Spoon
- Steel balls
- Weighing scale

Lab (2) - Shear-thinning fluids

- Pour 50g of ketchup and honey into two plastic bowls and record the time. Then squeeze a container with a nozzle to add another 50g of ketchup and honey, then record the time needed.



- Post activity

- Honey
- Ketchup
- Toasts
- Pancakes



Lab (3) - Shear-thickening fluids

- Weigh out 20g of water and around 30g of cornstarch in a plastic bowl then mix them well (make more if needed). The ratio between the water and the cornstarch could be adjusted accordingly. Pupils could play with the ratio as well to test the performance of shear-thickening fluids at different ratios. Then pour the prepared suspension into another plastic bowl and record the time. Try to keep the pouring rate consistent as previously.

- Once the suspension is prepared, drop the steel ball into the water and cornstarch suspension, and observe the behaviour of the ball in Newtonian fluids and Non-Newtonian fluids.



- Then use a spoon to quickly hit the water and the cornstarch suspension, and observe the behaviour of the spoon in Newtonian fluids and Non-Newtonian fluids.



Pack up

Clean up all the bowls, steel balls, and spoons, eat pancakes and toast with leftover ketchup, honey and water as a reward. (Don't waste them!) And pour the leftover oil.

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MATERIALS



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