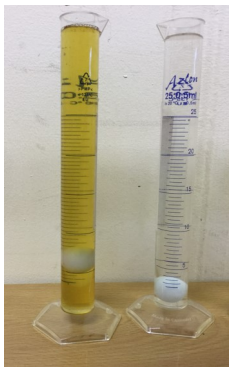
SCIENCE

11.1.19

What is the slowest liquid?

Viscosity is used to describe how runny (or not) a liquid is.
In assembly we dropped marbles into cylinders containing water, cooking oil, washing up liquid and honey. The most viscous was the honey. In this photo taken an hour after the experiment , the marble still hadn't reached the bottom.



So what?

How does learning about this help in real life? Well, have you ever struggled to get the last bit of ketchup out of the bottle? With a rough estimate, there is around 6g of ketchup that gets stuck to the side of the bottle and left in as it's thrown away because it's too viscous to flow out easily. Most ketchup bottles are now plastic. There are around 650 million bottles sold worldwide each year. A standard sized bottle contains 665g of ketchup. Using these numbers we can calculate a rough estimate as to how many bottles worth of ketchup are wasted each year:

6g x 650,000,000 bottles = 3,900,000,000g

3,900,000,000g ÷ 665g = ***5,864,661 bottles worth of ketchup wasted each year!***

In the assembly some children started to come up with ideas for how to prevent this waste and reduce the amount of plastic bottles we get through. Shania suggested putting ketchup in some sort of bag so all the ketchup could be squeezed out. Benny and Isabelle thought a return to the glass bottles would reduce the amount of plastic waste. Lucas thought about collecting all the left over ketchup from different bottles to make new whole bottles. Imogen suggested the shape of the bottle could change how easily the viscous liquid could flow out. If you want to draw and/or write your own engineering ideas for this problem, please send them in to school.

Here you can see one solution scientists and engineers have come up with, which involves spraying a coating to the inside of bottles of shampoo or detergent. This stops the viscous liquid from sticking. Could this work for ketchup? Alex was concerned we'd have the opposite problem and the ketchup would flow too easily. Jamie and Will pointed out you'd have to check the coating was safe for humans.

Very viscous

Something called the pitch drop experiment was begun in 1927. Hot pitch was poured in and allowed to cool. Then the bottom of the container was removed so it could flow out. The material is so viscous, that it is still pouring (VERY slowly) today. Each drop takes about 12 years to fall!