Basic Science Understanding Experiments

Building a Density Tower

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It's easy to stack boxes or books, but it takes a steady hand, and a bit of chemistry knowledge to stack liquids. Well, that's what we're going to do today. We're going to make a density tower out of common household liquids.

Now density is basically the amount of stuff that's squashed into a particular space, or volume. And if something has a large weight, which we also call its mass, it means that there's a lot of stuff squashed into a small space or volume.

Now to do this experiment, you're going to need to pick a range of household liquids that you think have got different densities. You can be as creative as you like, just don't pick anything dangerous, like bleach. So I've got things like runny honey. I've got ordinary tap water. I've got some milk, and a few others which I'm not going to reveal.

Now in order to create a successful tower, I need to work out what the densities of my liquids are so I can stack them in the right order. I poured out roughly the same amount of liquid into a series of identical glasses. Now it's important that the glasses are identical so that the weight of the glass has no bearing on the final weight measurement of the liquid.

So I'm just going to add 3 centimetres of my tap water. and I'm going to add some red food colouring to this, just so the final layers will stand out a bit better. And in this one I'm going to put about 3 centimetres of milk. So now I need to weigh the individual liquids and note down the weight. So this is my runny honey, and that is 530 grams. This is maple syrup, and that weighs 508 grams. So I need to carry on, and weigh all my other liquids. Now theoretically, the heaviest liquids should be the densest. So I'm going to put them at the bottom of my tower, and then pour the lighter liquids on top. So once I've weighted them all, I'm going to rank them in order of heaviest to lightest.

[MUSIC PLAYING]

So they're ranked from heaviest to lightest. The next thing you need to do is to print off the density

tower diagram from the download section. And you're going to use this to record which liquid you've put in which layer. Now the next thing-- you can just use an ordinary glass-- is to pour the liquids, very slowly and carefully, into the centre of the glass, making sure you don't get any liquid on the sides of the glass. So I'm going to start off with my runny honey. And on top of that I'm going to add my next heaviest liquid, which is the maple syrup.

So this is my tower. It probably still needs a little bit longer to settle out, but I think I've managed about seven layers. So I've got honey, maple syrup, then the milk, and then strangely, the Fairy liquid, which seems to have split the milk. Then I've got oil, and then just sitting, floating on the top of the oil, I've got the lightest liquid of all, which is my alcohol.