Chocolate Explozone Instruction Sheets for Explainers

1. Split the smartie
2. Smartie racing
3. Dancing cookie ingredients
4. Hero's fountain

Chocolate props

1. Split the smartie

Simple chromatography to look at the colours used in smartie coatings

What you need

Smarties (preferably brown, with green and blue to demonstrate the difference)
Filter or blotting paper
Cup of water
Plates

Preparation

Have all the items ready (keeping the smarties away from curious fingers)

What to do

Place a piece of paper on a plate, and a smartie on the piece of paper (use a brown smartie quite often, as they split the best). Using your finger, drop a few drops of water onto the smartie. As the water spreads out the paper will be dyed different colours. The dye for some smarties will split into different colours.

What is happening?

The colour in the sugar coating of the smartie shell dissolves in the water. The water is drawn out through the paper by capillary action and moves in a growing circle. The different inks that make up the smartie colour move at different speeds and so they are separated.

At the 'molecular level' smaller hydrophilic molecules migrate faster through the paper. Hydrophilic means a "water-loving" substance, as opposed to hydrophobic compounds which are not soluble in water. Cooking oil is an example of a hydrophobic substance. The colours that migrate the furthest from the candy have less of a mass than the ones closest to the candy.

Note that once the shell is wet, the smartie is not so crispy!

2. Smartie Racing

Smarties will move at different speeds through liquids of a different viscosity

What you need

Sealed boiling tubes filled with oils of different viscosity and three smarties each; sitting in a rack.

Preparation

Make sure the three smarties are at the bottom of each tube.

What to do

Turn the tubes over, so all the smarties fall along the length of them. Turn them back over to repeat. The smarties in the different tubes should fall at different speeds

What is happening?

The different oils in the four tubes have different thicknesses, they are of different **viscosities**. The more viscous a liquid is, the longer it takes the smartie to fall through it. Oils of different viscosities are used in different situations. Very thick oils are used as lubricants in engines, thin oils, such as vegetable oil, are used in cooking.

What are the oils?

Rapeseed oil is ordinary vegetable oil used in cooking.

10w40 and 14w40 are motor oils.

80w90 is transmission fluid, or gear oil.

3. Dancing cookie ingredients

Make raisins, chocolate covered raisins and chocolate chips dance in lemonade.

What you need

Transparent beaker full of lemonade, chocolate chips, chocolate covered raisins, raisins. A bucket for disposal.

Preparation

Have the beaker of lemonade and your chips and raisins ready

What to do

Drop the "ingredients" into the lemonade. They will sink to the bottom and then after 20-30 seconds float back up again. This will occur several times. Different "ingredients" will move at different speeds.

What is happening?

The "ingredients" float to the top because the bubbles in the lemonade stick to the sides of the raisin and make the raisin more buoyant. Some of the bubbles should be visible in the grooves of the raisins. Less grooved items should work less well as not as many of the carbon dioxide bubbles will be trapped. As the fizz of the lemonade is lost, the effect should stop, and there will be no more build up of bubbles.

N.B. The fizziness of the lemonade should last for some time, and a small swirl of the beaker will often get the raisins moving again. When they are well and truly exhausted, pour the liquid into the bucket. At the end of the day, take the bucket to the kitchen and dispose of the liquid and "ingredients".

5. Hero's Fountain

What to do

1. Turn the bottle over and watch what happens.

Why does the water go up into the second bottle?

What is happening?

Hero's fountain uses gravity and pressure to create a fountain of water.

Gravity pulls the water down from the top bottle into the bottom bottle. The amount of water in the bottom bottle goes up; this squishes the air inside that bottle and when you squish air, the air pressure increases. This higher air pressure forces some of the water coming down back up into the top bottle.