RAINBOW SKITTLES

EXPLORE DIFFUSION IN THIS WONDERFULLY COLOURFUL EXPERIMENT!

SAFETY:

- If you spill water, make sure to clean it up straight away!
- While the water should be contained, don't do this experiment in a place where spilled water could be dangerous e.g. near electrical cords.

WHAT YOU NEED

- A white bowl or plate
- ½ a cup water
- 3-5 Skittles of different colours
- A space where it's okay to get a little messy
- Cloth to wipe up any spills
- OPTIONAL: white caster sugar or sugar cube

WHAT TO DO

1) Place three Skittles into the bowl, making sure that each skittle is a different colour and has some space around it. You can experiment with placement, having them closer to the edge or the centre of the bowl, or making different patterns, like triangles, lines, or circles.
2) Gently pour a small amount of water into the bowl, until the skittles are mostly covered.
3) Watch as the colour from the skittles spreads out into the water around it. Be careful not to bump the plate! What happens when the colours meet?
4) OPTIONAL EXTENSION: Once the colours have spread to fill the whole plate, put a sugar cube or teaspoon of caster sugar at the centre of the bowl. What happens to the colours from the skittles after you've added this sugar?

WHAT'S HAPPENING?

The Skittle rainbow is a great visual representation of **diffusion.** Diffusion is when a substance spreads through another surrounding substance, such as water or air, moving

from an area of high concentration (an area with lots of that substance) to low concentration (an area with less of that substance). In this case, the Skittles are coated in a layer of sugar and dye. When this comes into contact with water, it starts to dissolve and then spread out. The amount of sugar in the water, or the concentration, is highest right next to the Skittle. In contrast, the plain water with no colour in it has almost no sugar (a low concentration of sugar). The sugar and the colours continue to spread out until they cover the whole plate, moving from the high concentration of sugar and dye into areas of low concentration in the plain water. Once the whole plate is covered with colour, the sugar is evenly spread across the whole plate.

Why don't the colours mix when they meet? The sugar and dye from the Skittles are moving from where there is a lot of sugar, to where there is no sugar. When two colours meet, they don't mix because they both have roughly the same amount of sugar. Instead, they continue to spread colour into the plain water.

When you add a sugar cube in the middle, you might have noticed the water around the sugar 'loses' its colour or pushes the Skittles' colours outwards. By putting a sugar cube in the middle of the bowl, we've increased the amount of sugar in the middle of the bowl. As the sugar dissolves, it diffuses away from the middle to where there is less sugar. Because the caster sugar or sugar cube has no colour, it appears to 'push out' the colour from the skittles.