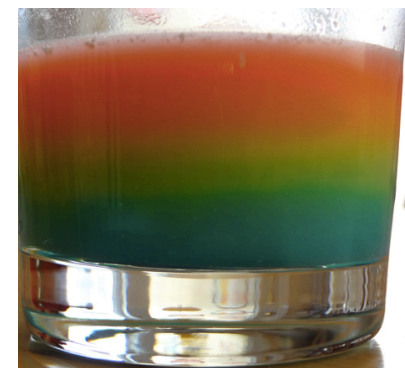


Topic	Density and the particle model	Level	For students aged 11-16
Outcomes	To calculate the density of solutions To apply the particle model to density To explain floating and sinking in terms of density		

Instructions for teachers – this demonstration can be a great introduction to the concept of density. Students should already have been introduced to the particle model. Practice the demonstration first and it is probably best to dissolve the skittles in a previous lesson as this takes time.



Instructions for the demonstration

Idea adapted from [Candy Experiments](#) by Lorelee Leavitt,

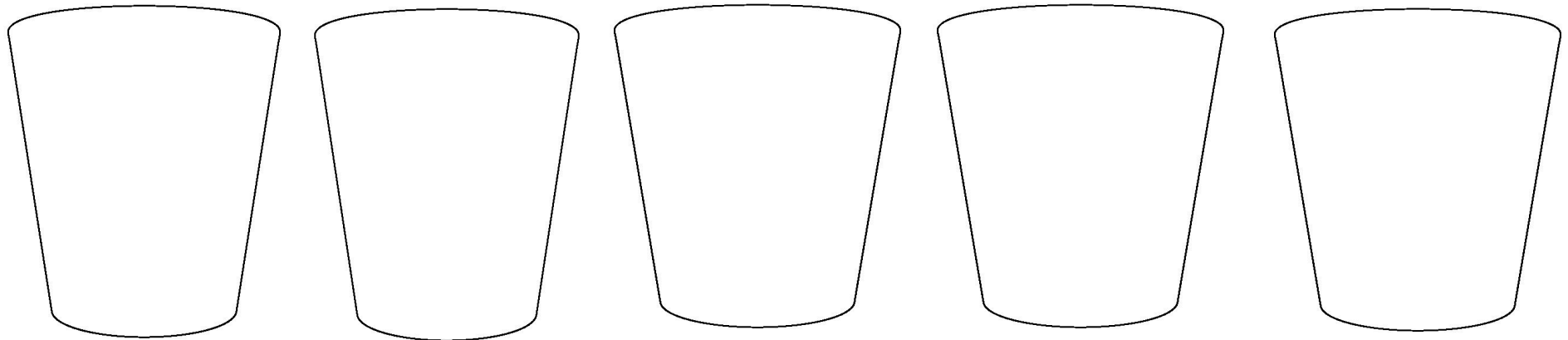
Apparatus you will need:

5 small cups, 1 cup of hot water, a tablespoon, a plastic pipette. You'll also need one pack of skittles: 2 red, 4 orange, 6 yellow, 8 green and 10 purple ones.

Method:

1. Pour 20 cm³ of warm water into each glass using a measuring cylinder
2. Record the mass of one skittle (*we will assume all skittles have the same mass*)
3. Pick the required number of skittles and put them into the glasses
4. Stir to dissolve and **leave for 60 minutes**.
5. Let the liquid cool down to room temperature
6. Using a pipette, pour the colored liquid into a small glass jar, starting with the most dense color (purple) and ending with the least dense color (red)
7. Drip the coloured liquid in **carefully**, otherwise all the layers will get mixed up.
8. It's better to make the liquids flow down the side of the jar slowly
9. You should get a rainbow of skittle colours

Colour	Red	Orange	Yellow	Green	Purple
Skittles	2	4	6	8	10
Volume of water (cm ³)	20	20	20	20	20
Mass of skittles + water (g)					
Density (g/cm ³)					



1. Draw particle pictures to represent the number of water and solute particles in each of the glasses
2. Complete the table above and calculate the density of each layer
3. Using your knowledge of density and the table to help you, explain why the yellow layer is on top of the purple layer but underneath the red layer
4. Use the idea of density to explain why a penny sinks but a ferry floats

