

## Student Sheet

In this practical I will be:

- Predicting what happens when alcohol and oil are added to water.
- Carrying out the practical, making careful observations of what happens when the liquids are mixed.
- Evaluating my original prediction- how was what happened similar or different from what I thought would happen?

### Introduction:

You are a well-known and highly respected science-artist in ancient Egypt, and you have just been asked to create a new painting on a temple wall.

Before you start, you have decided to clear up your workshop so you have room to work. Whilst doing so, you poured liquids from several jars together, which you can then pour away...but then you notice something interesting about the mixture.

Like all good scientists, you decide to investigate further...

### Equipment:

- 2 eye droppers (or disposable plastic pipettes)
- 2 beakers (100 cm<sup>3</sup>)
- 100 cm<sup>3</sup> water
- 10 cm<sup>3</sup> ethanol - Highly flammable and harmful
- 10 cm<sup>3</sup> olive oil (or any cooking oil)
- 1 measuring cylinder (100 cm<sup>3</sup>)

### Method:

1. Put around 50 cm<sup>3</sup> of water into a beaker.
2. Use an eye dropper (or plastic pipette) to take up a small quantity (approx. 2 cm<sup>3</sup>) of the alcohol.
3. Place the open end of the eye dropper (plastic pipette) about 0.5 cm below the surface of the water in the beaker.
4. Very gently squeeze some of the alcohol into the water and watch carefully what happens.
5. Record what you see. Draw a picture, take a photograph or write down what you see.
6. Now repeat steps 1–5 but this time use oil not the alcohol.
  - Does the same thing happen?
7. Now repeat steps 1–5 but this time use water, not the alcohol.
  - Does the same thing happen as happened with the alcohol?



- Does the same thing happen as happened with the oil?
- Why do you think there is a difference and what do think is happening?

**Theory:**

The chemistry of water mixing with other liquids, like alcohol and oil, is really quite complex. A simple explanation is that water molecules and alcohol molecules attract each other. Therefore, when alcohol is added to water, the molecules are attracted to each other and a solution of alcohol in water forms.

The opposite happens with oil and water. The molecules of oil push away from the water molecules. The oil molecules pull towards each other. Because the water is pressing on the oil molecules the oil forms into beads and because they are lighter they float to the surface. On the surface the oil flattens out to form a layer.