Convection currents – transcript

Convection is the way heat is transferred in fluids. Heated fluid becomes less dense and moves upwards, away from the source of the heat, carrying the energy with it.

In this experiment a coloured solution, and some gentle heat will be used to observe a convection current.

Add water to a beaker and place onto a tripod.

A grain of potassium permanganate is placed at one side of the beaker.

A Bunsen burner on a low heat is placed under the side of the beaker beneath the grain of potassium permanganate.

The water, coloured by the potassium permanganate, is rising.

As the water gains thermal energy, its particles vibrate more vigorously and the warm water becomes less dense and rises taking the colour of the dissolving crystal with it.

As the water continues to be heated, the purple water slowly across the top of the beaker.

Now the water is away from the heat source it begins to cool. The particles vibrate less energetically and the water becomes denser and falls to the bottom of the beaker.

Now the water is back at the base of the beaker, it is nearer the heat source. As it is heated again, the cycle repeats itself.

This theory can be used to explain onshore and off-shore breezes, why our bare feet feel cold when we open the fridge and why under-floor heating is more efficient than ceiling heating.