



## **The Science of Scent** KS3-4 duration: 1 hour

Students look at molecular structure and the ancient mixture of science, art and psychology that is perfumery, to consider how we detect scents, what makes things smell and if perfume can really make us more attractive!

### **Key Words**

Atoms. Biology. Chemistry. Investigation. Perfume. Physics. Prediction. Psychology. Scent. States of matter. Teamwork.

### **Learning objectives**

Recognise the importance of sense of smell as a biological function - and the extravagant claims made the perfume industry

Understand that molecules are made of atoms that can only bond in particular ways to make a variety of chemical structures

Recognise how we smell molecules and the pathway by which these messages are interpreted by our brain

Identify that even very small differences in molecular structure can result in distinctly different smells

Recognise that perfumes are usually a complex mixture of many different odorants (smelly molecules)

Understand that body heat causes liquid scents to evaporate, that the rate of evaporation varies with molecular mass and that as a result the smell of a perfume changes over time – from top note to mid note to base note

### **Content**

Describe how sense of smell can be useful to living organisms

Use Molymod to build molecules, recognising which structures are possible and impossible based on bonding

Describe molecules as being in constant motion, allowing them to evaporate and diffuse

Build complex molecules and relate differences in odour to visible differences in 3D structure

See how smaller molecules evaporate faster than larger molecules, leading to changes in the smell of a perfume over time

Smell a range of perfume ingredients of and identify a combination of these smells in commercial products

Use the Fragrance Wheel to identify bespoke terminology to describe scents found in two popular perfumes

### **Curriculum Links**

#### **Biology**

The role of diffusion in the movement of materials in and between cells

#### **Chemistry**

The properties of the different states of matter in terms of the particle model

Differences between atoms, elements and compounds

Chemical symbols and formulae for elements and compounds

The varying physical and chemical properties of different elements

### **Potential Hazards and accessibility**

Students will smell sample scents and perfumes, some of which are concentrated essential oils. Scents will not be applied directly to the skin.