

ACTIVITY

13

CHEMISTRY AT HOME

SUPER SCENTS



● ○ ○ EASY



6-11



30 MINS

*per activity plus
a week to infuse
the essential oil*



1

Learn about
how essential
oils and
perfumes
are made

2

Make your own
essential oils

3

Investigate how
scents spread

ENCOURAGING TOMORROW'S CHEMISTS TODAY

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SUPER SCENTS

Chemists can extract essential oils as fragrances to use in medicines, soaps, perfumes and cosmetics. Have you ever wondered how essential oils and perfumes are made?

Oil and water do not mix; they will separate into different layers. Most scents from plants are in the form of natural oils, which do not dissolve in water but will dissolve in other oils. Chemists can make essential oils by steam distillation. This is where hot steam is passed through the plant material, which drives out the natural oils. The mixture is then cooled and collected. As the essential oils will float on top of the water because they do not mix, they can be poured off separately.

Another way to extract an essential oil is to soak the plant material in jars of oil where the scents slowly dissolve into the oil. Perfumes are mixtures of essential oils in alcohol.

You will need

- 400ml olive oil or vegetable oil
- An orange
- Large handful of fresh mint (or any fresh herb)
- 2 small jam jars with lids
- Grater
- Teaspoon and tablespoon
- 2 clean empty yoghurt pots
- Orange and green food colouring
- PVA liquid glue
- Paintbrush
- Felt pens (preferably orange and green)
- White card (e.g. recycled cereal box)

Instructions

Activity 1

Making your own essential oils

1. Grate the whole peel of an orange and transfer the grated peel into a jam jar.
2. Rip the mint leaves into small pieces and put these into the other jam jar.
3. Fill the jam jars with olive oil until the jars are completely full and there is no air gap at the top.
4. Secure the jam jar lids. Leave in a cool, dark place for a week (carefully shake the jar each day to mix the oil and orange / mint mixture each day)
5. After a week, open the jar. Do the oils smell of the orange / mint?



Did you know?

The first recorded chemists were women. Tapputi and Ninu were perfume makers in Babylonia in 1200BC (over 3,200 years ago!). They used flowers and plants with the first recorded steam distillation equipment to make perfumes for religious offerings and the royal household.



Safety

Take care using graters.

Keep food colourings away from fabrics and furniture as they may stain.

This activity should be supervised at all times.



Instructions

Activity 2

Make a scratch and sniff picture

1. Using the pens, draw the outline of an orange and a mint leaf.
2. In a yoghurt pot, mix 2 tablespoons of PVA glue with 5 drops of orange food colouring and a teaspoonful of your orange essential oil from [Activity 1](#).
3. In the other yoghurt pot repeat with PVA, green food colouring and the mint essential oil.
4. Paint within your outline and leave to dry. Gently scratch your picture to release the wonderful scents.

Challenge 1

Investigate scent diffusion

Frances loves the smell of roses in her local park. She notices that the scent seems stronger on hot, sunny days. She wants to find out more about how scents can travel away from their sources.

Using your home-made essential oils from [Activity 1](#) design an experiment to investigate how scents travel. You could try adding a teaspoonful of oil to a tissue and:

1. Measure how far away from the tissue you can first detect the scent. Does the scent get stronger as you get closer to the tissue?
2. Test whether the heat from a hot water bottle / radiator makes essential oils scents travel faster or further than an unheated essential oil, by placing the tissue with the oil on it on top of the water bottle / radiator. For safety, remember to remove the tissue from the top of the radiator at the end of the experiment.



What's happening?

Make a scratch and sniff picture

The essential oils in the orange and mint slowly dissolve into the oil, which is why the oil takes on a lovely scent. When mixed with PVA glue, the essential oils become trapped. Disturbing the glue by scratching releases the scent.

What's happening?

Investigate scent diffusion

Have you ever watched what happens when you add blackcurrant diluting juice to a glass of water? The concentrated juice in the bottle is very dark purple, but as drops fall into the glass it quickly spreads out and mixes with the water until the whole glass is light purple.

As essential oils evaporate, they release scent molecules which are light enough to float in air. Scent molecules move out in all directions from the source of the smell. This happens quicker when it is hotter. The strongest smell is closest to the source; further away, the molecules might be so spread out in air that you may not smell the scent. This is the process of diffusion.



Did you know?

A single 30ml bottle of Chanel No 5 perfume contains the oils from 1,000 jasmine flowers and 12 whole roses.¹

¹<https://www.newyorker.com/magazine/2018/03/19/fragrant-harvest>