

## Smell tests

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### You will need:

- Nine different smell balls
- A *Dr. Einstein's Smell Test* worksheet to record your answers
- A pencil

In this activity you will be a smell detective and try to identify nine different smells. It doesn't matter if you do the numbers in order!

### What to do:

- 1 Using the first smell ball, try to identify what smell is inside.
- 2 Write your answer on your worksheet next to the number that matches the number on the ball.
- 3 Check your answers with another group or a workshop leader. You should be able to read a two word phrase down the boxes on the worksheet.

Remember: you can only use your nose! Do not open the smell balls or touch the material inside.

### Helpful hint

If you have a few guesses for the smell, check your worksheet and see how many letters are in the answer. This might help you work it out!

#### Did you know...

Humans use their noses to work out what something is made of. Machines can use spectroscopy as a way of identifying what makes up a gas. Scientists are developing a machine that can look at what is inside someone's breath. If it finds evidence of damaged cells this could be a way of helping doctors diagnose disease.

# Cryptography

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In this activity you will use cryptography to decode a secret message.

## **You will need:**

- A cipher: this is the secret message that you will decode
- The key: this is the information that tells you what rules to use to decode the message
- Extra paper and a pencil

## **What to do:**

- 1 Using the key, decode each of the letters that comprise the secret message.
- 2 When you are finished, share the message with the rest of your group. Does it make sense? Did you follow the code correctly?

## **Helpful hint**

You might decode all the copies of one letter you can find, or you might decode each letter in order. It's up to you!

### **Did you know...**

Scientists are working on codes that are almost impossible to break. Instead of using letters or numbers, they are using keys made of light. When light is observed it is disrupted and changed – which means it's easy to tell if someone has been trying to read your secret message

## Chemical carriers

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### You will need:

- A skeleton board
- A kit with scraps, two plastic spools, blu-tack and a marble
- A stopwatch

In this activity you will create a marble maze to model a chemical carrier.

### What to do:

- 1 Put the two plastic spools underneath the board closest to the skeleton's head. This should put your board at a slant with the skeleton's head raised from the table and the feet touching the table.
- 2 Choose one of the following challenges for your maze:
  - Move the marble from the skeleton's head to feet in exactly 10 seconds
  - Create a maze where the marble moves as slow as possible from the skeleton's head to feet
  - Move the marble between two different skeleton parts of your choice.
- 3 Use blu-tack to stick scraps onto the board and create a maze.

### Helpful hint

Use your stopwatch to time the marble every time you add a few pieces. Experiment and test while you attempt your challenge.

#### Did you know...

Scientists are creating chemical carriers that can move throughout the body, and they are so small they cannot be seen with the human eye. The carriers are tiny capsules with medicine inside that move around the body by running into molecules and getting instructions on where to go next. This is called chemical signalling.