

Is there life out there?



UK Space Agency Resources | Scouts |

This activity counts towards requirement 4 of the badge, by encouraging Scouts to discuss whether there is life beyond Earth

Did you know?

What is needed for life to survive?

MRS NERG

M – Movement
R – Reproduction
S – Sensitivity

N – Nutrition
E – Excretion
R – Respiration
G – Growth

Time needed: 45 minutes

Equipment (for one group):

3 empty jam jars
soil
adhesive labels
pens/pencils
15ml instant dry yeast (5ml per jar)
granulated sugar
3 alka-seltzer tablets (crushed, 1 tablet per jar)
500ml hot (but not boiling) tap water
magnifying glass
right size corks with holes (same number as plastic bottles)
bicycle pump with needle adaptor

Did you know?

The UK Space Agency is funding a mission to Mars. The mission – called ExoMars – will explore whether there is life or has been life on the red planet. To achieve this, a specialised robot – called a rover – will land on the surface of Mars and collect samples of the ground to test.

As basic requirements life forms require water and food to stay alive. It is therefore possible to look for signs of life by supplying food and water and seeing what is produced. When humans eat we produce energy and we also produce carbon dioxide in our breath. The same can be true for other life forms.

Instructions

1

Prior to the session, gather your jam jars (you'll need three per group). Using your pen and adhesive labels, label these A, B and C and prepare them as follows:

- Add soil to each jar until they are $\frac{1}{4}$ full.
- In jar A, add a small amount of sugar.
- In jar B, add instant dry yeast and sugar to $\frac{1}{3}$ of the jar.
- In jar C, add the powdered Alka-seltzer and sugar.

2

When you're ready to begin, give each group a magnifying glass and each of the three jars. Ask Scouts to imagine that the contents of these jars are soil samples from other planets. Together, they will be hunting for any signs of life within each sample. Ask them to think about what is needed for life to survive. You can refer back to Mrs NERG, which outlines each element that is required for life.

3

Explain that Scouts can smell and touch the samples to look for clues, but not taste them. You can ask them to take a small sample from each jar to look at under the magnifying glass. What do they see?

4

Next, give each group some hot (but not boiling) water. Ask the Scouts to pour the water onto each sample and observe what happens. They should notice that there is a reaction in jars B & C. After 10 minutes, ask the Scouts to look at the samples again. Have there been any changes? They should notice that jar B shows more activity over a longer period of time than the other jars. Why might this be?

5

Explain to the Scouts that jar B contains yeast, which is a living organism. This means that the reaction creates a life process. Meanwhile, jar C contains the Alka- Seltzer tablet, which creates a chemical reaction, rather than a life process reaction. By adding the water to jar A, they will observe a simple physical change when the sugar dissolves, rather than any kind of chemical or life reaction.

6

Ask Scouts to think about the type of experiments scientists might carry out to look at whether there is life on another planet. Which tools might they use to do so? What sorts of activity might they look for?

7

Gather as a whole group, or divide the Scouts into smaller groups. Ask the Scouts to discuss the possibility that life exists elsewhere in the universe. You could use the questions below to encourage discussion and debate.

- What might life look like on another planet? Could we find other species similar to humans living on other planets or would we be more likely to find single cell organisms?
- What would our reaction to finding life elsewhere be like? How would we feel about it?
- How would humans survive on another planet such as Mars? What would the challenges be? Examples could include the difficulty of getting hold of supplies like food, access to safe drinking water, and the challenges of building shelter on a planet so far away.