HUNTING ALIEN LIFEFORMS

When Space Rangers explore space and other planets they sometimes find alien life forms. So far in real-life we have yet to find any – but scientists are looking for evidence of life on other planets. We think that the most common life forms might be unicellular bacteria (eg bacteria that only has one cell). In this activity you can conduct your own search for microscopic life!

Unicellular life

On Earth, some of these unicellular creatures can survive in incredibly extreme conditions. Experiments have found that species of bacteria can survive:

- When exposed to gravity 403, 627 times heavier than Earth's gravity.
- In simulated Martian conditions
- In zero gravity
- In the vacuum of outer space

There is however an example of complex life, a multicellular creature that can survive in the vacuum of space and that is the Tardigrade.

These multicellular creatures are found throughout the earth's biosphere from the tops of mountains to the bottom of deep-sea trenches. Their amazing ability to survive is due to their ability to slow down their metabolism to only 0.01% of their normal and drop their water content to only 1% of normal. This allows them to survive up to 30 years in extreme conditions and still be able to rehydrate themselves, forage and reproduce. This ability has allowed them to survive the vacuum of space and the associated radiation, heat and cold to reproduce and survive the experience.

Tardigrades are found all over the world and using a microscope and a bit of foraging we can find and inspect our own tardigrades.

Your mission

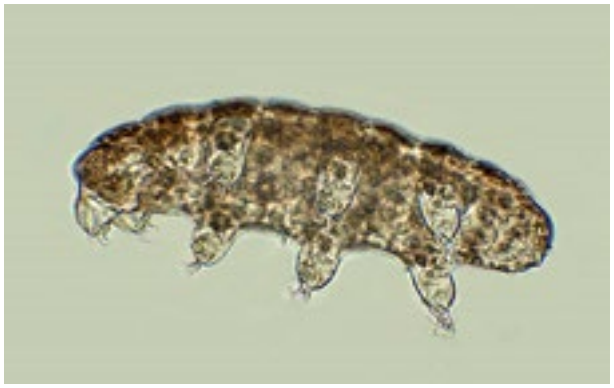
Tardigrades are found all over the world and using a microscope and a bit of foraging we can find and inspect our own tardigrades.

What you need

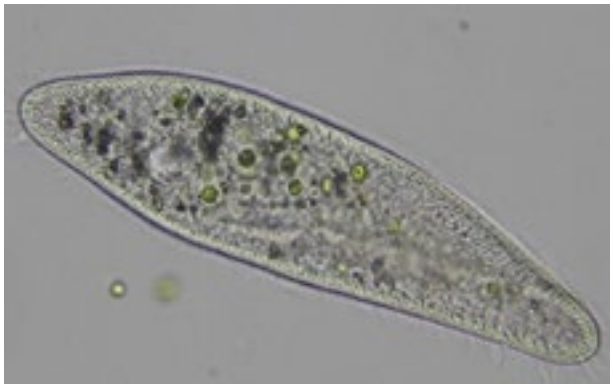
- A Microscope – That reaches between 20x and 50x magnification. (We use a set of Brunel SP27D because they can be connected to a laptop)
- Distilled/De-ionised water
- Some petri dishes
- Some plastic bags e.g. sandwich bags

What to do

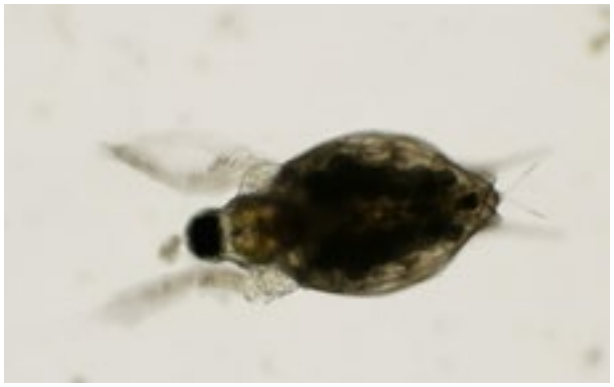
1. Head to a nearby pond, river, stream or mill race and using a plastic sandwich bag collect some moss. Tardigrades need water so moss from areas near water is more likely to have tardigrades. It's best to collect multiple samples from different areas to increase the likelihood of catching Tardigrades.
2. Place a small sample of moss onto a petri dish and cover in distilled or de-ionised water.
3. Leave this for 2 days to allow any Tardigrades to leave stasis and begin moving. They are easier to see when they are moving.
4. After 2 days place the petri dish under the microscope and start looking. There's lots of life to be found but can take a while to spot some of it. Compare what you can see to these images.



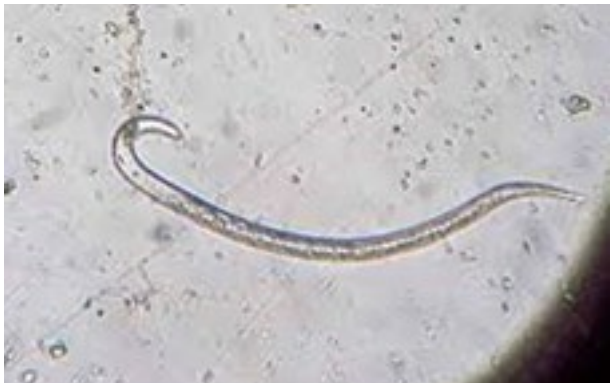
Tardigrade



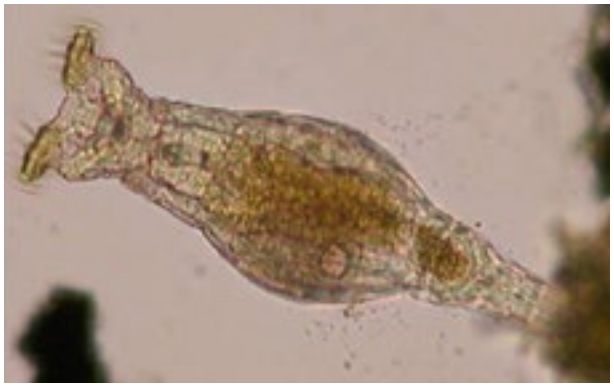
Paramecium



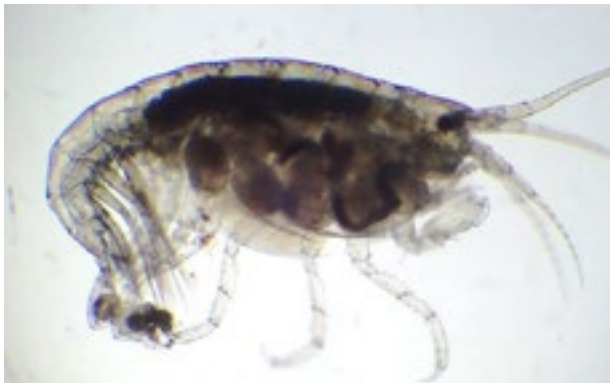
Water flea



Nematode



Rotifer



Amphipod

This resource was created by Xplore! with support from ASDC as part of Project Lightyear: Disney and Pixar have teamed up with ASDC to engage people with exciting science topics inspired by the film *Lightyear*.

Association for Science and Discovery Centres