



STEM clubs

BIOLOGY



Put simply, Biology is the study of all living things. These living things are called organisms and can include plants, fungi, animals, bacteria or protists (unicellular organisms)



BUT WHAT DOES THAT MEAN?

'Biology' literally means 'life study'. However, due to the complexity of living organisms it is almost impossible to study one organism without understanding several different fields of Biology.

There are considered to be 9 major fields of Biology: **Biochemistry, Botany, Cellular Biology, Ecology, Evolutionary Biology, Genetics, Molecular Biology, Physiology** and **Zoology**.

These different fields study a whole range of living things, from whole organisms right down to single-celled bacteria. Biologists must be able to look at the whole picture, even if they are only studying the cells that make up part of the whole organism. For example, if a zoologist wanted to understand how an animal as large as a giant panda survives despite only eating bamboo, they may have to study animal Ecology and Physiology as well as plant Botany and Biochemistry.

BECOME A BIOLOGIST

ACTIVITY 1



Do some quick internet research to find out what each of the **9 major fields of Biology** (listed in the paragraph above) focus on and see how they fit together.



ACTIVITY 2

We often think of scientists being dressed in white lab coats, goggles and protective gloves. However, if you're an ecologist, you are more likely to be working outdoors in a field than inside. Ecologists usually look at whole organisms but try to work out how different organisms interact with each other.

- Take a walk around your school grounds, especially any wildlife areas, and try to find some insects, plants and other living creatures
- Make a list of what you found and where you found them
- If you find a plant or creature, but you don't know what it is, take several photos of it and see if you can identify it by researching on the internet
- Are there any plants or creatures that are only found in certain areas? What do you think this could tell us about that species?

ACTIVITY 3

(The club leader may need to have a 'Here's one I made earlier' example of this activity ready to show to the students as the results of their experiment will take 24hrs)

To truly understand a species, we need to study its individual ecology (autecology). We are going to try and understand how the celery plant (and many others) gets water to its top leaves, without using any moving parts.

EQUIPMENT:

- Celery plant with leaves still attached
- Water
- Small container
- Food colouring

INSTRUCTIONS

- 1 Take one celery stalk with leaves still intact and cut the bottom 2cm off the stalk
- 2 Place the cut end into a beaker with some water
- 3 Add 3 or 4 drops of food colouring to the water and leave for 24 hours
- 4 The following day remove the stalk from the water and cut into sections
- 5 Examine the cut ends to see if you can identify where the water has travelled up the plant
- 6 Run the experiment again with a fresh piece of celery, but this time cut the leaves off and see if the same result occurs
- 7 What does this tell us about how water travels up the plant?
- 8 Does transpiration (the loss of water through plant leaves) explain anything?

SO WHAT?

We have looked at plants and creatures in this session. However, biology looks to explain how all life works and interacts together. Understanding how the natural world works is important. It helps us to understand how we can better interact with the world for the benefit of the natural world and the people in it.

FIND OUT MORE

There are lots of options to study Biology in Higher Education. If you are passionate about working with animals then Zoology, Veterinary Science or Marine Biology might be perfect for you. If you'd rather work with people, there are a huge range of healthcare careers to choose from, or if you're interested in how the body works, Biomedical Science, Biochemistry or Biotechnology could be the degree for you! You can read more about biology-focused degree courses, degree apprenticeships and related careers here: www.ucas.com/explore/subjects/biological-sciences

Not all science careers involve sitting in a laboratory wearing a white coat! Studying biology could take you to some unexpected places. Have a look at these experiential learning trips (also called field work) which Biological Science students at the University of Chester have been on recently: www1.chester.ac.uk/biological-sciences/study/undergraduate-study/student-experience/costa-rica-experiential-learning and <https://www1.chester.ac.uk/biological-sciences/study/undergraduate-study/student-experience/grenada-experiential-learning-trip>

Want to know more? See what biology courses you could be studying at the University of Chester: www1.chester.ac.uk/biological-sciences/undergraduate-study

NEED HELP?

Why not chat live to the team at Shaping Futures to find out more about what is on offer, or to get further advice and guidance www.shaping-futures.org.uk/activities