

14. Biodiversity is the basis of all life systems: What do we need for survival?

Discussion topics and information

Following from activity 13, this activity further investigates how biodiversity maintains our basic life systems.

Why is biodiversity important?

Biodiversity provides the life systems from which we obtain the essentials to our survival: food, clean water and oxygen.

Where does food come from?

The food plants we eat are grown in healthy soil. The animals that we eat survive by eating the plants which grow in healthy soils.

What is soil made of?

Decomposed matter (humus), rocks, catastrophic events, billions of micro-organisms. Micro-organisms as well as earthworms, slater beetles and chafer beetles work hard to turn waste into soil.

Where does clean water come from?

The water cycle: Evaporation > transpiration > condensation > precipitation

The water that we use comes from rainfall, creeks, rivers and reservoirs. The most effective ways of keeping water clean are natural: Wetland plants filter through removal of excess nutrients, macroinvertebrates tiny animals which can eat the potentially harmful algae, keeping it safe for human consumption, wetlands which slow the water down and let sediments sink to the bottom.

Where does clean air come from?

The earth's atmosphere is naturally made up of gases such as nitrogen, oxygen and carbon dioxide. We need oxygen to survive. The waste product of our breathing is carbon dioxide, so where does the oxygen come from? Almost all oxygen on earth comes from plant respiration. Trees and other plants take in carbon dioxide and breathe out oxygen. This is the opposite of the way animals and humans respire. Trees breathe through their leaves and use the sun to turn carbon dioxide into oxygen in a process called 'photosynthesis'. They keep some of the carbon, storing it in their leaves, roots and trunk, and breathe out oxygen, which we need to survive.

Lesson ideas

- Discuss where air, food and water come from, outlining the variety of life involved in each process.
- Ask students to imagine that they must live within an isolated biosphere for six months and ask them to consider the following:
 - They have basic sunlight, water, soil and air, but no food or shelter.
 - If they could choose what else they think they'd need to survive within that biosphere, what would they choose?
 - What would they NOT want within their biosphere?
 - How will they keep the air and the water supply clean?
 - How would they ensure a food supply?

Write down answers on whiteboard

- Point out variety, some of us need (think we need) resources that other people do not.
- Count how many resources are needed for human survival. Humans are just one species, consider every other species on Earth and their requirements.
- Ask how long would we survive without biodiversity?
- Ask students to write a report/ a few sentences/ illustrate their biosphere and why biodiversity is important to them.

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Recommended resources

http://www.indusscitech.net/edu_1.htm - What is photosynthesis (technical

<http://www.clw.csiro.au/education/soils/index.html> - Some excellent information on Australian soils

<http://www.dnr.state.wi.us/org/caer/ce/earth/groundwater/watercycle.htm> - Comprehensive look at the water cycle