

1.4.1 – 4 + 7 Ecology, Ecosystem, Biosphere, Habitat & Niche

Need to know

1. Define the term: ecosystem.
2. Name a range of ecosystems
3. Explain the term: biosphere.
4. Define the term: habitat.
5. Name examples of habitats.
6. Explain the term niche and give examples.

1.4.1 Ecology

What is Ecology?

Ecology is the study of how living things relate to each other and to their environment

Their **environment** refers to all the conditions in which the organism lives, which affect the growth and development of the organism.

1.4.2 Ecosystem

What is an Ecosystem?

An ecosystem is a community of living organisms interacting with one another and their non-living environment within a particular area.

The earth itself is a true ecosystem as no part of it is completely isolated from the rest.

Ecosystem = Communities + Environment

Learning check

What is ecology?

Ecology is the study of how living things relate to each other and to their environment

Diversity of ecosystems

Woodland, Hedgerow,
Seashore, Marine,
Grassland, Freshwater,
Tree, etc.

Can you name some more?

Ecosystems can be very large

To study an ecosystem

We divide the ecosystem into a number of smaller, more manageable areas (habitats).

Individual **habitats** are then studied.

Learning check

What is an ecosystem?

An **ecosystem** is a **community** of living organisms interacting with one another and their **non-living environment** within a particular area.

1.4.3 Biosphere

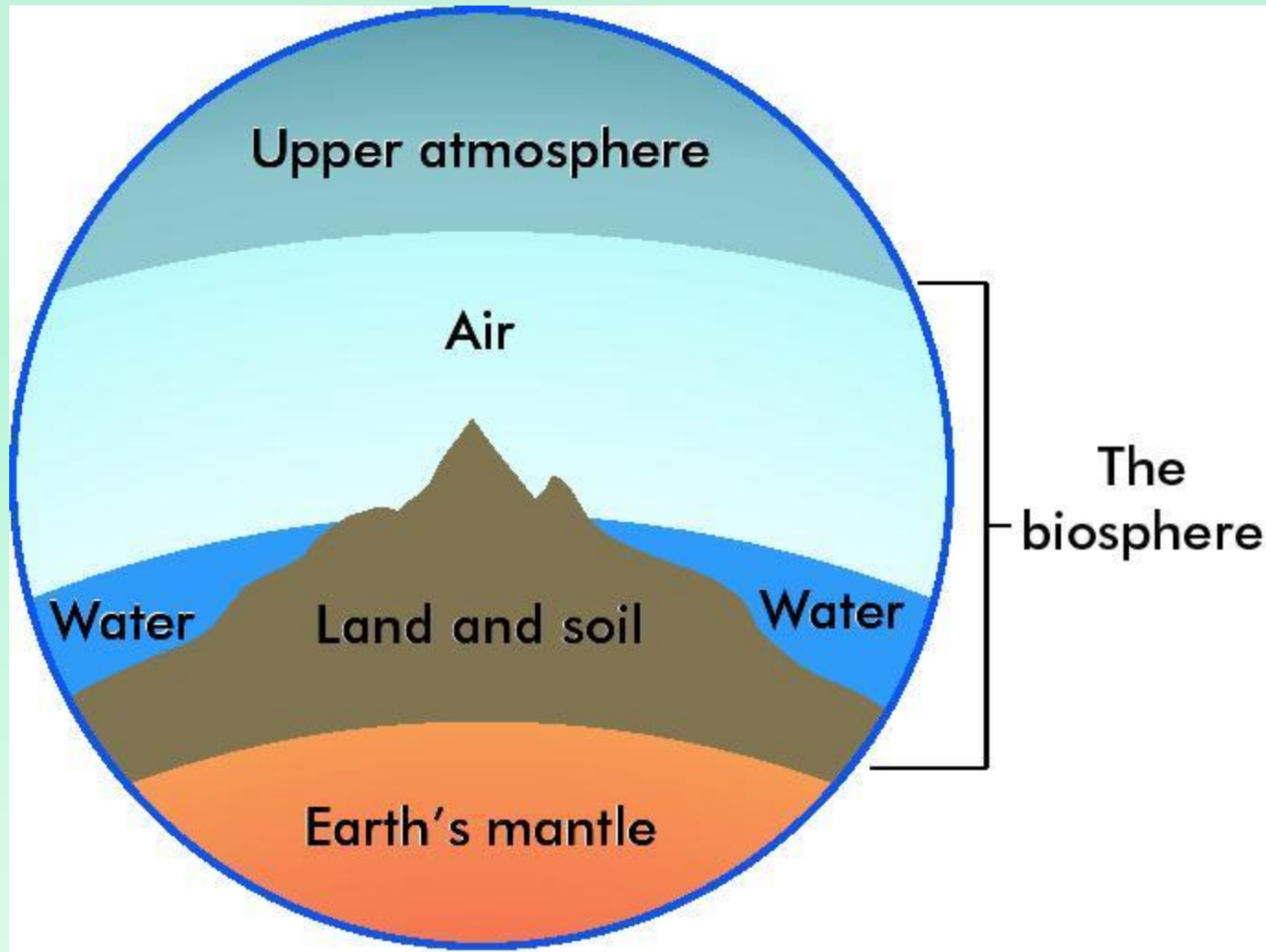
What is the **Biosphere**?



The biosphere is that **part of the earth inhabited by living organisms**, including land, ocean and the atmosphere in which life can exist.

It is the global ecosystem.

Biosphere



Relationships in the biosphere



The biosphere is made up of ecosystems.

Ecosystems are made up of communities of organisms and the environment.

Communities are made up of populations of different species of organisms.

Learning check

What is the biosphere?

The biosphere is that **part of the earth inhabited by living organisms**, including land, ocean and the atmosphere in which life can exist.

It is the global ecosystem.

1.4.4 Habitat

What is a Habitat?

A habitat is the particular place within the ecosystem **where an organism lives** and to which it **is adapted**

As a living organism (you) what is your Habitat, Ecosystem and Biosphere?

Summary

- **Biosphere** = that part of the earth and its atmosphere in which life can exist composed of ecosystems
- **Ecosystems** = composed of communities of organisms and their environment
- **Communities** = populations of different species of organisms
- **Habitats** = is the place where an organism lives and to which it is adapted

Learning check

What is a habitat?

A habitat is the particular place within the ecosystem **where an organism lives** and to which it **is adapted**.

1.4.7 Niche

Simple Definition

A **niche** is the functional role of an organism in an ecosystem.

Explanation of Niche

A **niche** is a term describing the relational position of a species or population in an ecosystem.

Niche Explanation (cont'd)

This includes how a population responds to the abundance of its resources and enemies (e.g. by growing when resources are abundant, and predators, parasites and pathogens are scarce)

and how it affects those same factors (e.g. by reducing the abundance of resources through consumption and contributing to the population growth of enemies by falling prey to them).

Niche Explanation (cont'd)

The abiotic (non-living) or physical environment is part of the niche because it influences how populations affect, and are affected by, resources and enemies.

The description of a niche may include descriptions of the organism's life history, habitat, and place in the food chain.

Learning Check

What is meant by a niche?

- A **niche** is the functional role of an organism in an ecosystem.

Niche Explanation (cont'd)

No two species can occupy the same niche in the same environment for a long time.

When plants and animals are introduced into a new environment, they can occupy new niches or niches of native organisms, outcompete the native species, and become a serious pest.

Lichens

Two lichens on a rock, in two different ecological niches.

Can you explain why they are different niches?



Lichenes on a rock

Author: Johann Dréo

Date: 2005, august, 10

Summary

For a species to maintain its population, its individuals must survive and reproduce.

Certain combinations of environmental conditions are necessary for individuals of each species to tolerate the physical environment, obtain energy and nutrients, and avoid predators.

Summary cont'd

The total requirements of a species for all resources and physical conditions determine where it can live and how abundant it can be at any one place.

These requirements are termed the **ecological niche**.

Interesting Historical Note

Charles Sutherland Elton, a British ecologist, gave the first working definition of the niche concept.

He was credited of saying "when an ecologist sees a badger, they should include in their thoughts some definitive idea of the animal's place in the community to which it belongs, just as if they had said 'there goes the vicar'"

END