

Ecosystems



Essential Standard 2.7

Explain how the lithosphere, hydrosphere, and atmosphere individually and collectively affect the biosphere.

Learning Objective 2.7.1

Explain how abiotic and biotic factors interact to create the various biomes in North Carolina.

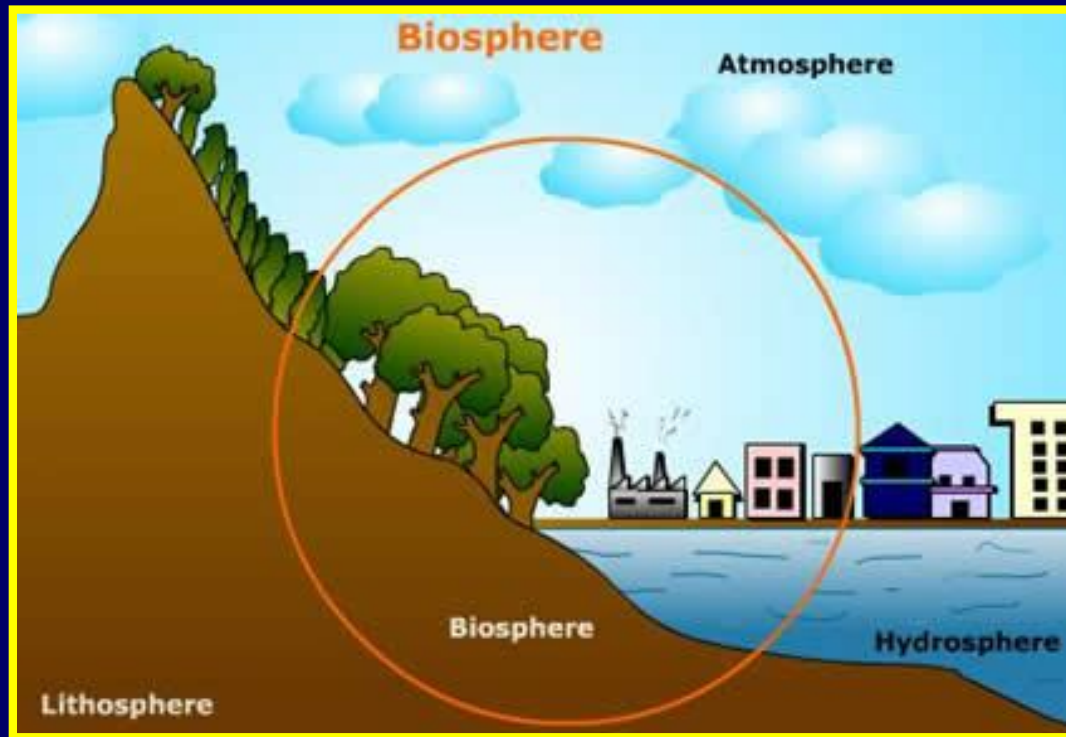
I Can Statements

At the end of this lesson, you should be able to say, with confidence:

- I can distinguish between abiotic and biotic factors.
- I can describe the various levels within an ecosystem.

Biosphere

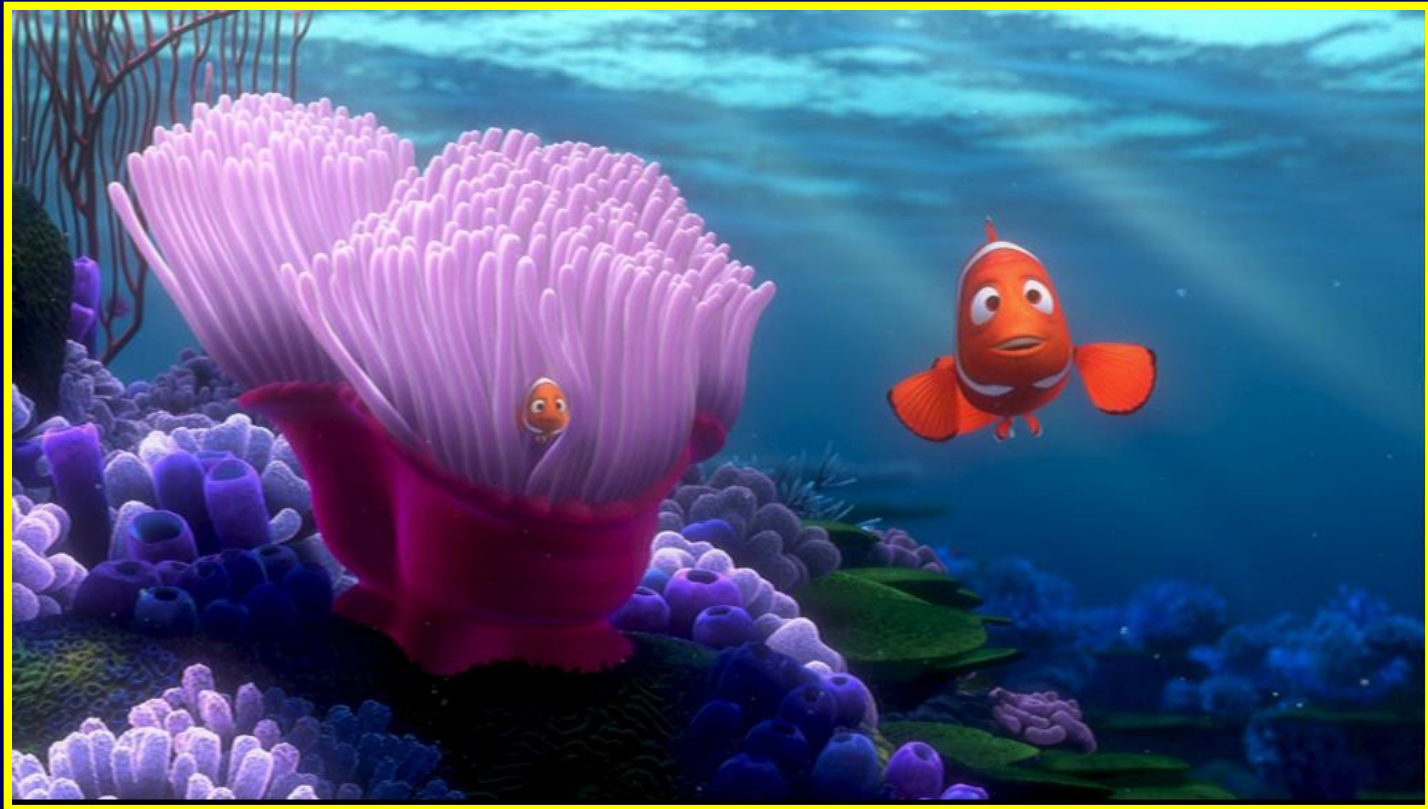
On Earth, all living things live within the Biosphere.



The biosphere includes the parts of the atmosphere, hydrosphere, and lithosphere that can support life.

Interactions

Within the biosphere, all organisms depend upon and interact with their environment.



Abiotic Factors

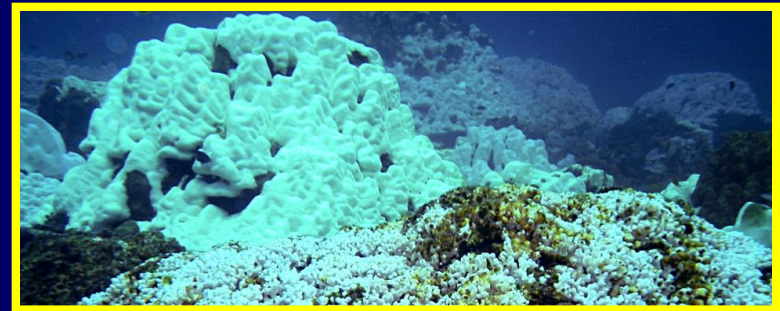
The non-living parts of an organism's environment are called abiotic factors.



Some examples in a coral reef environment might include: Sand, Rocks, Water, Temperature, pH, Pressure, Light, Oxygen, and Minerals.

Abiotic Factors

Coral needs clear saltwater so there is enough light for the algae to photosynthesize, a specific temperature range, and a specific pH range.

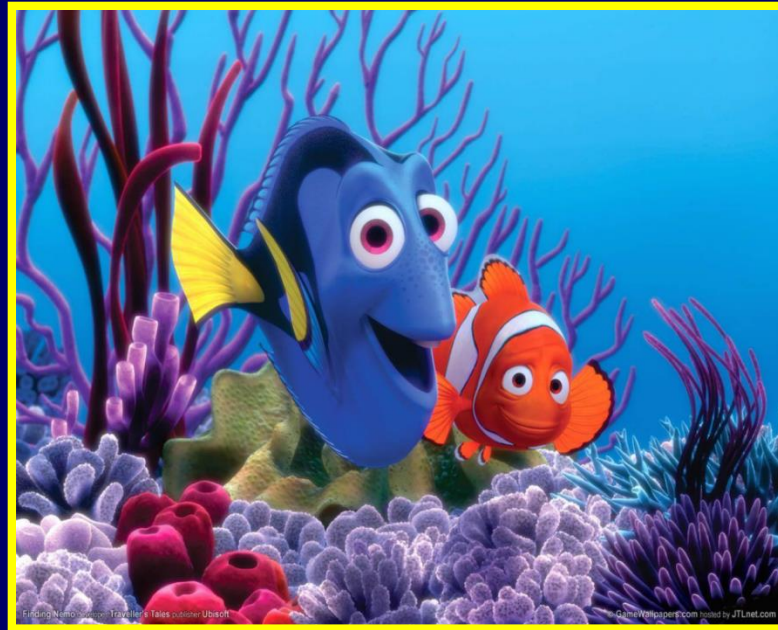


If the water temperature becomes too hot or too cold, the coral will expel the symbiotic algae and become white in a condition called coral bleaching.

Coral reefs are only found where all of the above abiotic conditions are met.

Biotic Factors

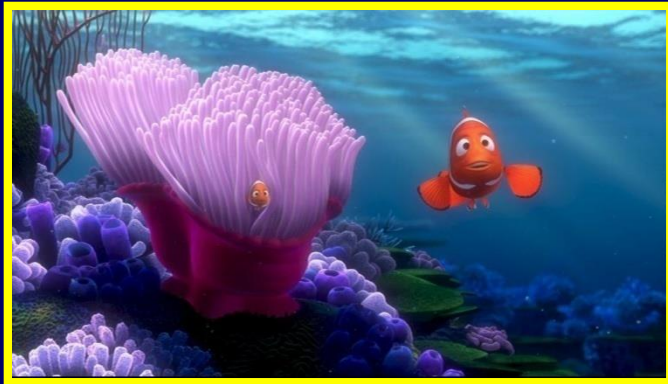
The living parts of an organism's environment are called biotic factors.



Some examples of biotic factors in a coral reef include: Populations of Fish, Algae, Coral, Plants, Sea Anemones, and Bacteria.

Biotic Factors

Clownfish, like Nemo, depend upon sea anemones for protection, and are affected by competition for available food, as well as by the number of predators there are in the environment.



The clownfish and sea anemones relationship, competition for food, and predation are all biotic factors that determine how well a clownfish can survive in a particular area.

Ecosystem

All the living and non-living, or biotic and abiotic factors, in any particular environment make up what is called an ecosystem.



Coral Reef Ecosystem

Community

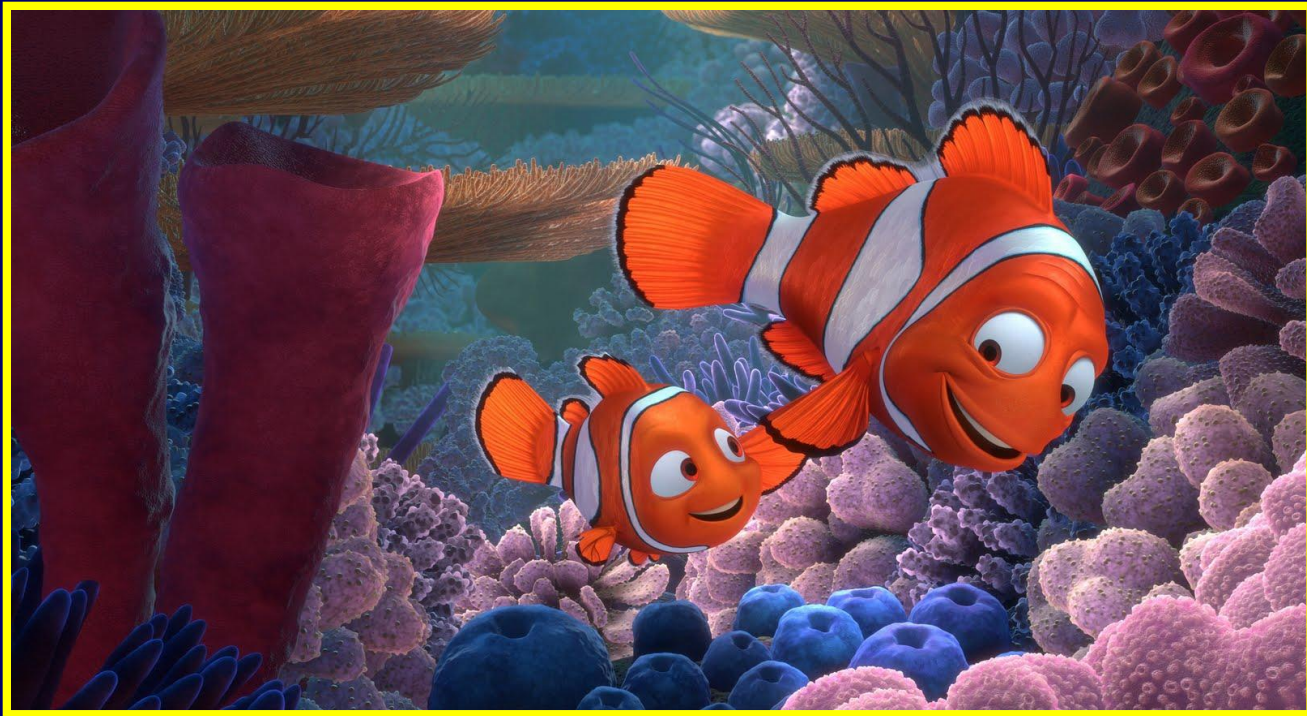
Within an ecosystem, the biotic factors, which would include all of the different species, make up what is called the community.



Examples of a community in a coral reef include: Sea Turtle, Clownfish, Angel Fish, Stingray, Sea Horse, and Squid.

Population

Within the community, one individual species makes up what is called a population.



An example of a species in a coral reef ecosystem would include all the clownfish.

Organism

Within a population, one individual, that has all the characteristics of life, is called an organism and can be an animal, plant, fungi, algae, or bacteria.



An example of an organism in the coral reef ecosystem would be Nemo.

Habitat

Where an organism lives is called its habitat.

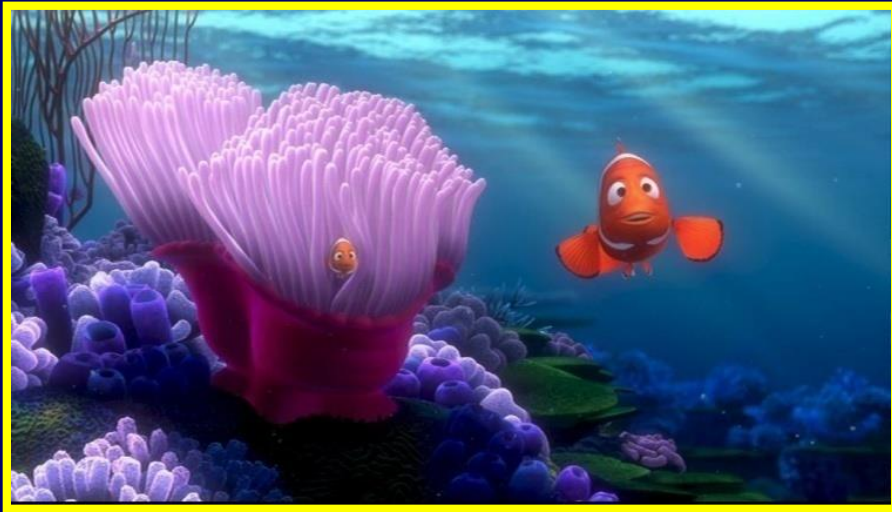


Nemo's habitat is a coral reef in the southern hemisphere.

You would find a clownfish, like Nemo, in the open ocean, the tidal zone, and definitely not in freshwater.

Niche

A niche is the role a species plays within a community and includes the types of food it eats, where it lives, and its relationship with other species in its community.



Clownfish, like Nemo, live in sea anemones and eat the algae on the sea anemones, thereby keeping the sea anemones clean. The sea anemone, in turn, provides protection to the clownfish.

That special relationship between the clownfish and the sea anemone is its niche.

The End

