**3.1 What Is Ecology?**

**Ecology is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Studying Our Living Planet**

 The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ consists of all life on Earth and all parts of the Earth in which life exists.

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 The biosphere extends from about \_\_\_ km above Earth’s surface to as far as \_\_\_ km below the surface of the ocean.

**The Science of Ecology**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_** is the scientific study of interactions among and between organisms and their physical environment.

 Organisms respond to their environments and can change their environments, producing an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Levels of Organization**

**-Individual organism**

**-Population**—a group of individuals \_\_\_\_\_\_\_\_\_\_\_\_\_ to the same species and live in the same area

**-Community**—many different populations that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**-Ecosystem**—\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that live in a place, together with their physical environment (or surroundings)

**-Biome**—a group of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that share similar climates and typical organisms

-**Biosphere—\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Biotic and Abiotic Factors**

-The biological influences on organisms are called biotic factors.

 \*aka \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 -Physical components of an ecosystem are called abiotic factors.

 \*aka \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Biotic Factors**

 A **biotic factor** is any living part of the environment with which an organism might interact.

 -including \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Abiotic Factors**

 An **abiotic factor** is any nonliving part of the environment.

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**Biotic and Abiotic Factors Together**

 The difference between abiotic and biotic factors is not always clear. Abiotic factors can be influenced by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 For example, pond muck contains nonliving particles, and also contains mold and decomposing plant material that serve as food for bacteria and fungi.

**Biotic and Abiotic Factors Together**

 In addition, trees and shrubs affect the amount of sunlight the shoreline receives, the range of temperatures it experiences, the humidity of the air, and even the chemical conditions of the soil.

 A dynamic mix of biotic and abiotic factors shapes every environment.

**Ecological Methods**

 What methods are used in ecological studies?

Regardless of their tools, modern ecologists use \_\_\_\_\_\_ methods in their work:

1.

2.

3.

 -Each of these approaches relies on scientific methodology to guide inquiry.

**Observation**

 Observation is often the \_\_\_\_\_\_ step in asking \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ questions.

 Questions may form the first step in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Experimentation**

 Experiments can be used to test \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 An ecologist may set up an artificial environment in a laboratory or greenhouse, or carefully alter conditions in selected parts of natural ecosystems.

**Modeling**

 Many ecological events occur over such \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or over such large \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that they are difficult to study directly.

 Ecologists make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to help them understand these phenomena.