

### Vocabulary

• **Biology:** Science that deals with the origin of life and its history, the structure of the living organisms, how they do their job, and how they communicate with each other.

• **A living thing (organism)** made up of one or more cells and able to carry the main characteristics of life.

• The main characteristics of the living organisms (organization, growth, organization, reproduction, needs energy, response to stimuli, maintaining internal equilibrium, adaptation).

• Living things also **display organization**, which means they are arranged in an orderly way.

• **Cell:** cell is the fundamental unit of life, and all living things are composed of one or more cells or the secreted products of those cells.

• Specialized cells are organized into groups that work together called **tissues**.

Tissues are organized into **organs**.

• **Organ systems** work together to support an organism.

• **Growth** results in the addition of mass to an organism and, in many organisms, the formation of new cells and new structures. and it gets lots of abilities.

• **The response** to an internal or external stimulant is called, response

• **An adaptation** is any inherited characteristic that results from changes to a species over time and enables organisms to survive and pass on their genes to the next generation.

• **Reproduction** is not essential for the survival of an individual, but it is essential for the continuation of the species.

• **A species** is a group of organisms that can breed with one another and produce fertile offspring.

• Anything that is part of the internal or external environment and causes a reaction by the organism is called a **stimulus**.

• The reaction to a stimulus is a **response**.

• **Hypothesis:** an idea or explanation that you then test through study and experimentation.

• **SI units:** meters for length, kilograms for mass, second for time.

• **Dependent variable:** represents the output or effect or is tested to see if it is the effect.

• **Independent variables:** represent the inputs or causes, or are tested to see if they are the cause.

## CHAPTER 1: Introduction to Biology

### Part 1: What is Biology?

- **Biology** is the study of the origin and history of life, as well as the structures of living things.
- **Biologists** investigate diseases, develop technologies, improve agriculture, and protect the environment.
- \* **Investigate diseases:** what causes them and how to cure and prevent them.
- **Technologies Development:** the use of scientific knowledge to meet human needs, such as the "bionic" hand.
- **Improve agriculture** by researching plant genetic engineering to make plants more resistant to diseases and insects.
- **Protect the environment:** to keep species from becoming extinct.

**Q1 Which of the following is not a biological study...**

**CH** A Environmental protection

**1** B Disease research.

C Astrophysics.

D Species research

**Biologists investigate diseases, develop technologies, improve agriculture, and protect the environment** → C

**Q2 Prosthetic limbs are an example of...**

**CH** A Agricultural advancement.

**1** B Technological advancement.

C Environmental protection.

D Disease research.

**Technologies Development:** the use of scientific knowledge to meet human needs, such as the "bionic" hand. → B

**Q3 A researcher studied genetic engineering in plants and their ability to resist diseases and insects; this researcher is currently working on...**

**CH** A Agricultural advancement.

**1** B Technological advancement.

C Environmental protection.

D Disease research.

**Improve agriculture** by researching plant genetic engineering to make plants more resistant to diseases and insects. → A

**Q1 The artificial heart is an example of...**

**Do** A Agricultural advancement.

**It?** B Technological advancement.

C Environmental protection.

D Disease research.

**Q2 Which of the following would most likely be the major focus of a biologist?**

**Do** A Bacteria found in hot springs

**It?** B The composition of water in hot springs

C The temperature of hot springs

D The location of the hot springs.

**Q3 Which would be an activity conducted by a biologist?**

**D** A Describe the behavior of brown bats

**It?** B Design a new, solar-powered car

C Identify the cause of an earthquake

D Teach people how to plant corn

### Part 2: Characteristics of Life

**Shows organization, grows and reproduces, requires energy, responds to stimuli, adapts, and maintains homeostasis.**

**Organisms** can be unicellular, such as bacteria and paramecium, or multicellular, such as humans and plants.

**Species:** a group of organisms that can reproduce and produce fertile offspring.

- **Growth** is defined as the addition of mass to an organism.

- **Stimulus:** something that causes the organism to react.

- **Response:** an organism's reaction to a stimulus.

- **Adaptation** is an organism's ability to adapt to its surroundings.

- **Homeostasis** is the regulation of an organism's internal conditions in order to keep it alive.

**Q4 A group of organisms that can mate and produce fertile offspring...**

**CH** A Order B Family C Species. D Genus.

**1** **Species:** a group of organisms that can reproduce and produce fertile offspring. → C

**Q5 Which of the following causes a living organism to respond...**

**CH** A Gathering B Response

**1** C Adaptation D Stimulus

**Stimulus:** something that causes the organism to react. → D

**Q6 An organism's reaction to stimuli...**

**CH** A Gathering B Response

**1** C Adaptation D Stimulus

**Response:** an organism's reaction to a stimulus. → B

**Q7 Inside the human body, heat is constantly generated as a byproduct of chemical reactions. Humans must be able to release heat into the environment. This adaptation is necessary for maintaining \_\_\_\_\_.**

**CH** A Energy B Organization

**1** C Homeostasis D Locomotion

**Homeostasis** is the regulation of an organism's internal conditions in order to keep it alive. → C

**Q4 Mating happens between organisms of the same**

**Do** A Order B Species. C Family D Genus.

**It?**

**Q5 The white hair of a polar bear is an example of a (n)**

\_\_\_\_\_.

**Do** A Gathering B Response

**It?** C Adaptation D Stimulus

**Q6 Desert plants adapt to lack of water, by mutating their leaves to the next except**

**Do** A Presence of stomata in the cavities

**It?** B Wrapping of leaves

C Decreased number of stomata

D Increased leaf surface area

## CHAPTER 1: Introduction to Biology

### Part 3: Scientific Methods

Scientists depend on scientific methods according to organized steps: **observation, hypothesis, data collection, and conclusion.**

**Observation:** a direct method of gathering information

**Hypothesis:** a testable explanation

**Data collection:** It is carried out by conducting experiments

**Experiment:** an investigation of a phenomenon under highly regulated conditions to test the hypothesis, including:

The **control group** is used for comparison.

The **experimental group** will be exposed to the influence of the agent to be tested.

**Independent variable:** It is the factor to be tested and can affect the outcome of the experiment

**Dependent variable:** The factor results from and depends on the independent variable

**Conclusion:** An assumption based on previous experience

**An inference** is: "An educated guess made through observation."

**The theory** is an explanation of a natural phenomenon supported by many observations and experiments

**A scientific law** is a description of a relationship that Allah created in the natural world supported by numerous experiments such as the law of mass conservation" mass does not die and does not develop during a chemical reaction."

**The metric system** uses the following units: meter to measure length, kilogram to measure mass, liter to measure volume, and second to measure time.

**Q8** A group of students observed the behavior of sick frogs in a pond, which is known as...

**CH** A Hypothesis. B Observation.

1 C Conclusion. D Theory.

**Observation:** a direct method of gathering information

→ B

**Q9** A researcher observed a bat, and after thinking deeply, he concluded that bats belong to mammals, this is called...

**CH** A Hypothesis. B Observation.

1 C Conclusion. D Theory.

**Conclusion:** An assumption based on previous experience

→ C

**Q10** After a scientist has observed the growth of a plant in the light and collected information about it, the next step is to

**CH** A Hypothesis formulation

1 B Make an experiment

C Conclusion

D Hypothesis Test

**Hypothesis:** a testable explanation

→ A

**Q11** The scientist Fleming believed that *Penicillium* secretes a substance that kills bacteria, this is considered

**CH** A Hypothesis B Observation.

1 C Conclusion. D Theory.

**Hypothesis:** a testable explanation

→ A

**Q12** Interpretation of a natural phenomenon based on observations and investigations over time

**CH** A Conclusion

1 B Hypothesis

C Theory

D Scientific law

**The theory** is an explanation of a natural phenomenon supported by many observations and experiments → C

**Q7** Tasha is testing the effect of blue-colored light on the growth of tomato plants. Which is the independent variable in this experiment?

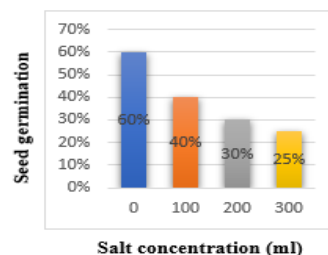
**Do** A Light color

**It?** B Light intensity

C amount of light

D Temperature of light

The adjacent figure shows the experience of the effects of salt concentrations on seed germination in a certain period of time, the dependent variable in this experiment is



**Q8**

A Salt concentration

B Time period

**Do** C Seed type

**It?** D Germination of seeds

**Q9** Which of the following is an observation?

**Do** A You record the air temperature every day for a week.

**It?** B You propose that a cold front is approaching.

C You hypothesize that the temperature will increase tomorrow.

D You conclude that the season is changing.

### Chapter 1: Do It Answer key

1	2	3	4	5	6	7	8	9
B	A	A	B	C	D	A	D	A