

CORNELL NOTES

Directions: You must create a minimum of **5 questions** in this column per page (average). Use these to study your notes and prepare for tests and quizzes. Notes will be stamped after each assigned sections (if completed) and turned in to your teacher at the end of the Unit for scoring.

UNIT 1: INTRODUCING BIOLOGY

Chapter 1: Biology in the 21st Century

I. The Study of Life (1.1)

A. Earth is home to an incredible _____ of life

1. The _____ includes all living things and all the places they are found.

2. Every part of the biosphere is _____ with every other part.

3. The biosphere includes many _____

a. Land environments

b. _____ and _____ environments

c. Portions of the _____

4. Biodiversity is the variety of life

a. Generally _____ from the _____ to the _____

b. Greater in areas with consistently _____ temperatures.

5. A _____ is one particular type of living thing.

a. Members of a species can _____ and _____.

b. Estimated to be about _____ million different living species.

B. All organisms share certain _____

1. _____ is the scientific study of all forms of life.

2. An _____ is any individual living thing.

a. All are made of **one or more** _____

b. All need _____ for **metabolism**

c. All _____ to their **environment**

d. All have _____ that they pass on to offspring.

II. Unifying Themes of Biology (1.2)

A. All levels of life have _____ of related parts

1. A **system** is an organized group of _____ parts.

a. A **cell** is a **system** of _____ and _____.

b. A **body system** includes _____ that interact.

c. An **ecosystem** includes _____ and _____ things that interact.

2. Biologists study many different systems

B. **Structure** and **function** are related in biology

1. **Structure** _____ **function**

a. **Proteins** with different structures perform different functions.

b. Heart muscle cells have a different structure and function than stomach muscle cells.

c. Different species have different _____ structures with different functions.

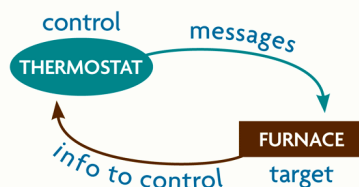
C. Organisms must maintain _____ to survive in diverse environments.

1. **Homeostasis** is the _____ of **constant internal conditions**.

a. **Homeostasis** is usually maintained through _____

VISUAL VOCAB

Thermoregulation maintains a stable body temperature under a variety of conditions, just as a thermostat regulates a furnace. Both mechanisms use feedback to keep temperatures within set ranges.



b. **Negative feedback** systems **return** a condition to its _____ (set) point.

2. **Behaviors** and _____ can help maintain homeostasis.

D. _____ explains the unity and diversity of life

1. **Evolution** is the _____ in living things over _____.

a. The **genetic makeup** of a population of a species _____

b. **Evolution** can occur through _____ of **adaptations**.

c. **Adaptations** are _____ inherited traits that are passed to future generations.

2. Evolution accounts for both the _____ and **unity** of life.

III. Scientific Thinking and Processes (1.3)

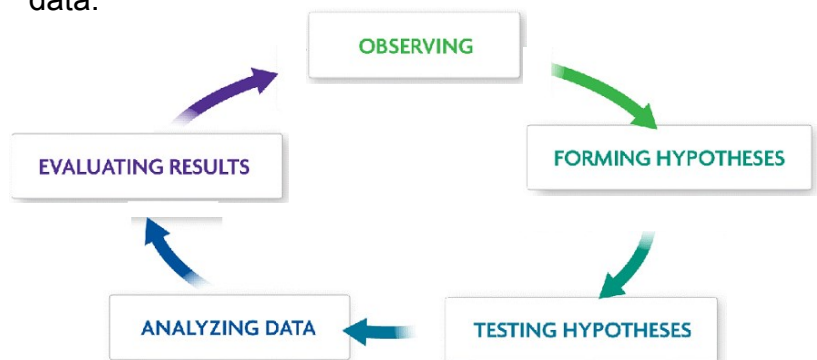
A. Like all science, biology is a **process of** _____

1. Scientists make careful and systematic _____.

2. Scientists record observations as _____

3. Scientists form a _____ as a possible answer to a question

4. Scientists _____ their hypotheses and analyze their data.



B. Biologists use _____ to test hypotheses

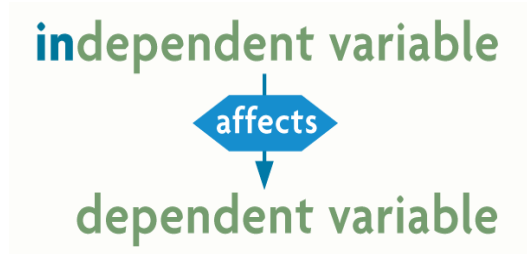
1. Observational studies allow scientists to describe a _____

2. **Experiments** allow scientists to determine what

_____ a phenomenon

a. _____ **variables** are manipulated

b. _____ **variables** are observed
and measured.



c. _____ (_____
variables) are conditions that are kept the same

C. A _____ explains a wide range of observations

1. Theories explain a wide range of observations and experimental results.

2. A **theory** is _____ by a wide range of scientific **evidence**.

3. **Theories** can _____ based on evidence

IV. Imaging technologies provide new views of life (1.4)

A. A _____ provides enlarged image of an object.

1. **Light microscope**

2. **Scanning electron microscopes (SEM)**

3. **Transmission electron microscope (TEM)**

B. **Imaging technology** is used in **medicine**

1. **X-ray images**

2. **Magnetic resonance imaging (MR)**

3. **Functional MRI (fMRI)**

C. Complex systems are _____ on computers

1. Computer models are used to study systems that _____ be studied directly

- a. Heart attacks
- b. Effect of medicines on the human body
- c. Movement of water molecules into and out of a cell
- d. Spread of a diseases through a population

2. Computer models are used when experiments are not _____, _____, or _____

D. The tools of molecular genetics give rise to new biological studies.

1. A _____ is segment of **DNA** that stores genetic information

2. Through our understanding DNA, we can study genetics on a molecular level

a. molecular genetics

b. **Genomics**

V. Your health and the health of the environment depend on your

_____ of biology (1.5)

A. Knowledge of biology helps you understand your _____

- 1. Food allergies
- 2. Potential effects of obesity
- 3. cancer
- 4. Effects of alcohol, tobacco, and other drugs.

B. Knowledge of biology can help you understand environmental issues.

- 1. Interactions in _____.
- 2. Pollution
- 3. Biodiversity

C. _____ offers great promise but also raises many issues.

1. **Biotechnology** is the _____ and _____ of living things and biological processes.

a. **DNA testing** in medicine and forensics

b. **Transgenic** (genetically modified) crops

c. **Transgenic bacteria**

2. Questions are raised about the use of biotechnology

a. Safety of _____ modified crops

b. Spread of undesirable genes

c. Decrease in _____.

d. Ethical considerations

D. Biology presents many unanswered questions

1. Over the past 50 years, biological knowledge has greatly increased.

2. Advances in _____ may help answer questions.