

**BIO 1040 Cell and DNA**  
**Chapter 1 Introduction to Biology**  
**Sections 1.1 and 1.2**

The aim of this reading/study guide is to help you to learn the course material each week. The guides go along with each chapter reading in the textbook and focus on the material that I want you to learn for exams. While you are working on these guides, make note of the concepts that are confusing and then ask questions during class (if taking on-campus), on the BB site, or during office hours. **These guides will not be submitted for a grade and keys will not be posted.**

**Section 1.1: Themes and Concepts of Biology**

**Learning objectives:**

- Identify and describe the properties of life
- Describe the levels of organization among living things
- Understand the basics of the taxonomy and binomial nomenclature

**Important terms:**

|                        |               |               |
|------------------------|---------------|---------------|
| biology                | molecule      | population    |
| order                  | macromolecule | community     |
| sensitivity to stimuli | organelle     | ecosystem     |
| reproduction           | cell          | biosphere     |
| adaptation             | prokaryotes   | evolution     |
| growth and development | eukaryotes    | taxonomy      |
| regulation             | tissues       | domain        |
| homeostasis            | organs        | binomial name |
| energy processing      | systems       | genus         |
| atom                   | organisms     | species       |

**Properties of Life:**

1. Define the following properties of life.

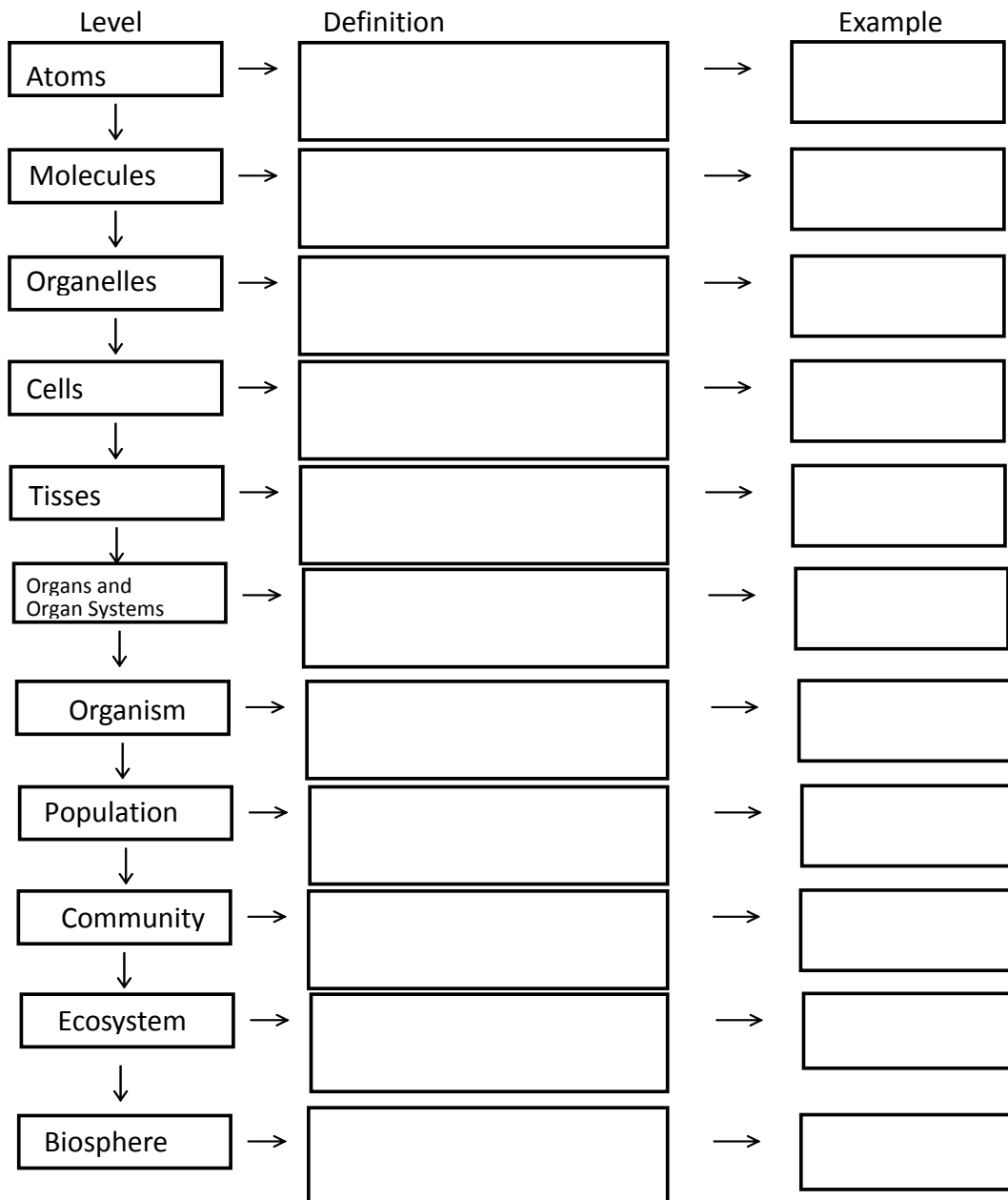
- Order:**
- Sensitivity to stimuli**
- Reproduction**
- Growth and development**
- Adaption**

f. Homeostasis (note I consider regulation part of homeostasis)

g. Energy Processing:

**Levels of Organization of Living Things:**

2. Fill in the following concept map illustrating the biological levels of organization.



3. Cells can be classified prokaryotic or eukaryotic. What are two differences between prokaryotes and eukaryotes?

### **The Diversity of Life**

4. What is evolution?
  
5. The science of classifying biological organisms is called taxonomy. This system classifies organisms in eight levels based on similarities. List the 8 levels of taxonomy from highest to lowest level.
  
6. There are three domains in taxonomy.
  - Name the three domains.
  
  - How do the organisms in the three domains differ from each other?
  
  - Which types of organisms are found in each domain?

7. In taxonomy, every organism is given a binomial name. The first name represents the genus of the organism and the second name represents the species of the organism.

- Which name is more specific, genus or species?
- List the rules for writing a binomial name.
- Write your name (first and last only) in binomial nomenclature. Which of your names (first or last) should come first?

## **Section 1.2: The Process of Science**

### **Learning objectives:**

- Understand and practice the process of scientific inquiry
- Compare inductive and deductive reasoning

### **Important terms:**

scientific method

hypothesis

scientific theory

inductive reasoning

qualitative data

quantitative data

deductive reasoning

falsifiable

variable

control

conclusion

### **The Nature of Science**

8. Why is it important that all scientists follow a similar scientific method?

9. The scientific method tests hypotheses and develops theories.

- What is a hypothesis?
- How is a prediction different than a hypothesis?
- How is a scientific theory different from a hypothesis?

10. Two methods of logical thinking are used in science:

- define inductive reasoning:
- define deductive reasoning:

11. Which of the following represents inductive reasoning and which represents deductive reasoning?

- All the dogs that have been observed, can bark, therefore all the dogs can bark.
- Cacti are plants and all plants perform photosynthesis; therefore, cacti perform photosynthesis.
- Every time you eat peanuts, your throat swells up and you can't breathe. So, you are allergic to peanuts.
- Red meat has iron in it and beef is red meat, so beef has iron in it.

## Hypothesis Testing

12. Make a list of the steps of the scientific method. Refer to Figure 1.18.

13. What does it mean that a hypothesis should be falsifiable?

14. What is an experimental variable?

15. What is a control? Why are controls important in the scientific method?