BIO 101
Principles of Biology 1

Welcome to

DEEP IGNORANCE!
What is deep ignorance?

Think of the this room as *the WHOLE universe* and the light rays coming in as *our knowledge of it*.

*How much do we know about the WORLD around us?*
Recently scientists discovered 4 new species of Legless lizards!!!

Where?
Bio 101- Principles of Biology 1

K. Villatoro

-Syllabus:  www.elcamino.edu/faculty/kvillatoro/bio101.html

You are responsible for knowing and following the information presented on this syllabus

- Lab manual and text book

-Contact your instructor at: kvillatoro@elcamino.edu
Grade breakdown

• 25 labs x 5 points = 125
• 21 quizzes x 5 points = 105
• 4 lab tests x 75 points = 300
• Ecology and Evolution tests x 75 points (10 essay) = 150
• Other 4 tests 115 (15 essay) = 460
  total = 1140
• Honors project 50 points \rightarrow total points = 1190

IMPORTANT POLICIES:
No make ups on labs or lab test!!!
Any work turned in late is worth only \( \frac{1}{2} \) the credit
Emailed work is not accepted
In order to make up a lecture test, you will have to show written proof of absence
Cheating will NOT be tolerated, you will receive a 0 and will be reported
Bloom's Taxonomy of Educational Objectives

**Higher Level Cognitive Skills**

- **Synthesizing**: Students can bring multiple ideas together to do something new with them.
- **Evaluating**: Students can use their knowledge to make value judgments in socially/professionally relevant situations.
- **Analyzing**: Students can use their knowledge to break complex problems into their component parts for some purpose.
- **Applying**: Students can apply the ideas they have learned to new examples beyond those they first learned them in.
- **Understanding**: Students can explain in their own words the information they have learned.
- **Remembering**: Students can recall the information they have been exposed to.

**Lower Level Cognitive Skills**

As adapted by Anderson & Krathwohl (2001) and Powers (2008)
What is expected of you?

- **self motivated and self starter**

- **Focus** on the work to be done. Complete all assignments and turn them in on time.

- Get **involved**. Ask questions, form study groups, and use the resources that course offers to help learn, website, lectures notes, labs, textbook, and professor.

- Be **professional**. Come to class on time and prepared. Respect others, and clean after yourself
Resources available to you:

• On my website: lecture notes, lab notes, study guide, concept list

• Book: lab manual, biology textbooks at the library and Mesa

• Academic strategy courses

• Tutoring and office hours:
  First assignment: sign up for a meet my office
  5 min slots
  Tell me about yourself:
  What are your future academic goals
  What classes are you taking
  Are you working
  Have you taken a bio course before
  What do you foresee the biggest challenge will be during this semester?
## Scientific Theories in Biology

<table>
<thead>
<tr>
<th>Theory</th>
<th>Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell</td>
<td>All organisms are composed of cells, and new cells only come from pre-existing cells.</td>
</tr>
<tr>
<td>Homeostasis</td>
<td>The internal environment of an organism stays relatively constant.</td>
</tr>
<tr>
<td>Genes</td>
<td>Organisms contain coded information that dictates their form, function, and behavior.</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>Populations of organisms interact with each other and the physical environment.</td>
</tr>
<tr>
<td>Evolution</td>
<td>All organisms have a common ancestor, but each is adapted to a particular way of life.</td>
</tr>
</tbody>
</table>
Evolution Handout
Part 1. Watch the sickle cell story

How does the video relate to the characteristics of life?
• Organization
• Reproduction
• Metabolism
• Homeostasis
• Growth
• Evolution
• Response
• Genetic code
The study of life reveals common themes

- Life is shows several levels of organization,

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biosphere</td>
<td>The part of Earth that contains all ecosystems</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>Community and its nonliving surroundings</td>
</tr>
<tr>
<td>Community</td>
<td>Populations that live together in a defined area</td>
</tr>
<tr>
<td>Population</td>
<td>Group of organisms of one type that live in the same area</td>
</tr>
<tr>
<td>Organism</td>
<td>Individual living thing</td>
</tr>
<tr>
<td>Groups of Cells</td>
<td>Tissues, organs, and organ systems</td>
</tr>
<tr>
<td>Cells</td>
<td>Smallest functional unit of life</td>
</tr>
<tr>
<td>Molecules</td>
<td>Groups of atoms; smallest unit of most chemical compounds</td>
</tr>
</tbody>
</table>
Cell types

- Are composed of one or more cells

<table>
<thead>
<tr>
<th>Prokaryotes</th>
<th>Eukaryotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller</td>
<td>Larger</td>
</tr>
<tr>
<td>Simpler</td>
<td>More complex</td>
</tr>
<tr>
<td>Most do not have membrane-enclosed organelles</td>
<td>Membrane-enclosed organelles</td>
</tr>
<tr>
<td>Bacteria and archaea</td>
<td>Protists, plants, fungi, animals</td>
</tr>
</tbody>
</table>
The Characteristics of Living Organisms

- Maintain homeostasis
The Characteristics of Living Organisms

- Living organisms engage in metabolic activities: cellular respiration and photosynthesis

- These processes involve the transformation of energy and matter
The Characteristics of Living Organisms

- **Obtain energy (and matter) from their environment to support metabolism and growth**

- **Interaction of organisms with their environment**
The Characteristics of Living Organisms

- Living organisms contain genetic information that governs their structure and function
Genes determine the traits of an organism.
The Characteristics of Living Organisms

- Reproduce via sexual or asexual reproduction via DNA
The Characteristics of Living Organisms

- A population changes from one generation to the next

**EVOLUTION BY MEANS OF NATURAL SELECTION**

1. **Genetic variability**
   - Original population
   - Some animals run faster than others.

2. **Differential reproduction**
   - Faster animals are more likely to survive and reproduce.

3. **Adaptation**
   - Next generation
   - Fast runners are more common than in the original population. Therefore, this population has evolved from one generation to the next.
Optional: Study Guide book

- Read chapter 1
- Complete interactive questions: 1.1, 1.2
- Answer questions 7, 8, 9, 10