REVIEW SHEET: UNIT #5: Cell Specialization

Test on: Friday, January 20, 2017

Textbook Reading:
Ch. 7.1 Life is Cellular (pg. 190-194)
Ch. 7.2 Cell Structure (pg. 196-207)
Ch. 18.1 Finding Order in Diversity (pg. 510-515)
Ch. 18.3 Building the Tree of Life (pg. 523-528)
Ch. 20.2 Prokaryotes (pg. 580-585)

Suggested Videos:
Bozeman Science – A Tour of the Cell
Amoeba Sisters – Introduction to Cells
Bozeman Science - Endosymbiosis
Amoeba Sisters – Specialized Cells

Online Tutorials:
Types of Microscopes: http://www.cpalms.org/Public/PreviewResourceStudentTutorial/Preview/119048
Microbe Evolution & Classification: http://outreach.mcb.harvard.edu/animations.htm

Additional Interactive Websites on Cells:
Online Tutorial: “Cells, Cells Everywhere!” (learn about cell theory
http://www.cpalms.org/Public/PreviewResourceStudentTutorial/Preview/115502
Genetic Science Learning Center: “Inside a Cell” (tour a cell)
http://learn.genetics.utah.edu/content/cells/insideacell/
Cells Alive (Interactive animations, diagrams, and quizzes on cells)
http://www.cellsalive.com/
The Virtual Cell (interactive cell tour)
http://www.ibiblio.org/virtualcell/tour/cell/cell.htm

Additional Videos:
Crash Course Biology: “Eukaryopolis”
Khan Academy: “Structure of a Cell”
https://www.khanacademy.org/science/biology/structure-of-a-cell

Images to Label in your Notes:

Suggested Concept Maps:
Venn Diagram Comparing Types of Microscopes
Venn Diagram Comparing Prokaryotes & Eukaryotes
Venn Diagram Comparing Animal Cell & Plant Cell
Flow Chart: Levels of Classification from broadest to most specific
Organelle Chart: Structure – Function – Cell Type Located In
Vocabulary Terms:

**Subtopic #1: Microscopes**

<table>
<thead>
<tr>
<th>Dissecting Microscope</th>
<th>Light Compound Microscope</th>
<th>Scanning Electron Microscope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferring Electron Microscope</td>
<td>Eyepiece</td>
<td>Ocular lens</td>
</tr>
<tr>
<td>Objective lens</td>
<td>Revolving nosepiece</td>
<td>Body tube</td>
</tr>
<tr>
<td>Arm</td>
<td>Base</td>
<td>Stage</td>
</tr>
<tr>
<td>Stage clips</td>
<td>Diaphragm</td>
<td>Fine adjustment knob</td>
</tr>
<tr>
<td>Coarse adjustment knob</td>
<td>Slide</td>
<td>Wet mount</td>
</tr>
<tr>
<td>Coverslip</td>
<td>Field of view</td>
<td>Total magnification</td>
</tr>
<tr>
<td>Resolution</td>
<td>Micrometer</td>
<td></td>
</tr>
</tbody>
</table>

**Subtopic #2: Classification**

<table>
<thead>
<tr>
<th>Taxonomy</th>
<th>Classification</th>
<th>Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingdom</td>
<td>Phylum</td>
<td>Class</td>
</tr>
<tr>
<td>Order</td>
<td>Family</td>
<td>Genus</td>
</tr>
<tr>
<td>Species</td>
<td>Archaea</td>
<td>Bacteria</td>
</tr>
<tr>
<td>Eukarya</td>
<td>Animalia</td>
<td>Protista</td>
</tr>
<tr>
<td>Plantae</td>
<td>Fungi</td>
<td>Prokaryotes</td>
</tr>
<tr>
<td>Eukaryotes</td>
<td>Endosymbiosis</td>
<td>Cell</td>
</tr>
</tbody>
</table>

**Subtopic #3: Cell Structure & Function**

<table>
<thead>
<tr>
<th>Organelles</th>
<th>Cell theory</th>
<th>Nucleus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nucleolus</td>
<td>DNA</td>
<td>Chromosomes</td>
</tr>
<tr>
<td>Plasmid</td>
<td>Nuclear envelope</td>
<td>Plasma membrane</td>
</tr>
<tr>
<td>Cell wall</td>
<td>Cytoskeleton</td>
<td>Microfilaments</td>
</tr>
<tr>
<td>Intermediate filaments</td>
<td>Microtubules</td>
<td>Centrioles</td>
</tr>
<tr>
<td>Flagellum</td>
<td>Cilia</td>
<td>Cytoplasm</td>
</tr>
<tr>
<td>Cellulose</td>
<td>Peptidoglycan</td>
<td>Vacuole</td>
</tr>
<tr>
<td>Vesicle</td>
<td>Lysosome</td>
<td>Endoplasmic reticulum</td>
</tr>
<tr>
<td>Golgi apparatus (Golgi body)</td>
<td>Chloroplasts</td>
<td>Chlorophyll</td>
</tr>
<tr>
<td>Photosynthesis</td>
<td>Mitochondria</td>
<td>Cellular respiration</td>
</tr>
</tbody>
</table>

**Handouts:**

- Online Tutorial: Microscopes
- Cell Organelle Chart
- Online Tutorial: Microbe Evolution & Classification
- NOTES #1: Everything Microscopes
- NOTES #2: Classification & Cell Structure/Function
- LAB: Getting to Know Your Microscope
- LAB: Exploring Plant & Animal Cells
- LAB: Observing Protists
Objectives:
- Compare and contrast the four different microscopes.
- Differentiate between magnification and resolution.
- Calculate the total magnification of a light compound microscope.
- Calculate the field of view under high-power in a light compound microscope.
- Describe how a light compound microscope works to produce an image.
- Estimate the size of an objective under low-power.
- Calculate the number of micrometers from millimeters (and vice versa).
- Describe how to make a wet mount slide.
- State the three parts of the cell theory.
- Name one scientist and their contribution to the cell theory.
- Compare and contrast prokaryotes and eukaryotes.
- Describe endosymbiosis and state three pieces of evidence that support it.
- Describe the structure and function of the nucleus.
- Describe the roles of vacuoles, vesicles, and lysosomes.
- Differentiate between the roles of microtubules, intermediate filaments, and microfilaments as a part of the cytoskeleton.
- Compare and contrast the plasma membrane and the cell wall.
- Identify the role of ribosomes, endoplasmic reticulum, and golgi apparatus in making proteins.
- Describe the function of chloroplasts and mitochondria.
- Explain how the Domain Archaea and Domain Bacteria differ.
- Explain the role of bacteria in the living world.
- Give an example of a cell and how it is specialized to do a particular function.
- Give an example of a protist and describe its structure, locomotion, and reproduction.

Practice Problems:
1. Are the following statements about prokaryotes, eukaryotes, or both?
   - Have multiple, linear chromosomes
   - Do not have membrane-bound organelles
   - Are thought to be the oldest organisms on earth
   - Contain their own DNA
   - Have a cell membrane
   - Have ribosomes
   - Maintain homeostasis
   - Compose multicellular organisms
   - Can reproduce
   - Include protists
   - Include bacteria
   - Some may survive without oxygen
   - Are either heterotrophic or autotrophic

2. Identify the cell structure that matches the description:
   - Determines what enters and exits the cell
   - Prevents the plant cell from bursting and gives the cell rigidity
   - Stores large amounts of water, salts, and sugars
   - Contains digestive enzymes to breakdown wornout organelles
   - Collects, packages, and sends materials out of the cell
   - Stores and transports materials in and around a cell
   - Reads the cell’s instructions to make proteins
3. Label the overall steps of protein synthesis in a eukaryotic cell.

1. 

2. 

3. 

4. 

5. 