## **Unit 2 Portfolio Checklist: Biological Structures, Functions, and Processes**

## **Learning Objectives:**

* Describe the importance of polarity in maintaining cells and living organisms. (1)
* Describe the fundamental chemistry of living cells. (3)
* Describe the flow of energy and matter in cellular function. (3)
* Investigate the structure of cells and cell parts. (3)
* Describe the structure and function of organs and organ systems in plants and animals. (2)

## **What will your portfolio include?**

*The following items should be included for each unit discussed in class*:

* **Title page**—This must include a heading (i.e., Biological Structures, Functions, and Processes), your name, and class period.
* **Table of Contents**—The TOC needs to list each item and unit heading and show page numbers.
* **Nature of Science**—In your own words, write 1-3 paragraphs to show that you understand how scientists work and communicate as it pertains to the unit being discussed. You may draw upon your research experiences in class or in-class discussions we have had about the work of other scientists.
* **Unit Summary:**
	+ Answer the following guiding questions:
		- What is the structure and function of the four major macromolecules?
		- How do the properties of water contribute to the maintenance of cells and living organisms?
		- What is the role of enzymes in cell chemistry? How do enzymes function?
		- What are similarities and differences between autotrophic and heterotrophic cells?
		- How is the process of photosynthesis carried out?
		- How is the process of respiration carried out?
		- What are the similarities and differences between photosynthesis and respiration?
		- How are cells produced from existing cells?
		- What is the cell theory and how was the theory developed?
		- How are materials transported in and our cells to enable the cell to maintain homeostasis?
		- What is the relationship between the organelles in a cell and the functions of that cell?
		- What is the function of the following organs: *heart, lungs, skin, leaf, stem, root, ovary, xylem, phloem.*
		- What is the relationship between the structure and function of organs in one organism to the structure and function of organs in another organism?
		- What is the relationship between an organ and an organ system?
		- What is the structure and function of the following organ systems: *digestion, respiration, circulation, nervous*)
		- What is the relationship between the tissues that make up organs and the structure and function of the organ?
	+ Your answers should include the following **terms** and **concepts**:

 *Organelles*

 *Photosynthesis*

 *Cellular respiration*

 *Osmosis*

 *Diffusion
 Active transport*

 *Homeostasis*

 *Cell theory*

 *Carbohydrate*

 *Protein*

 *Lipid*

 *Nucleic acid*

 *Fatty Acid*

 *Amino Acid*

 *Glucose*

 *Enzyme*

 *Activation energy*

 *Chlorophyll*

 *Prokaryote*

 *Eukaryote*

 *Fermentation*

 *Organ*

 *Organ system*

 *Homeostasis*

 *Tissue*

* + Terms and concepts must be underlined and the summary should be 2-3 pages excluding illustrations. Original illustrations are encouraged! Borrowed illustrations must be cited with author and date.
* **Review of science literature** - Demonstrate that you can read and understand science in the news as it pertains to this unit.
	+ Select one article from a newspaper, magazine, or journal.
	+ Briefly summarize the article and explain how it connects to what we are learning in class.
	+ Explain how you connect personally with the information in your reading.
	+ Include the article clipping or a copy.
* **Evidence of experimental technique -** Demonstrate that you can safely conduct, analyze, and reflect upon a scientific investigation.
	+ Include one formal lab report from your class work for the unit. For this unit, you will include your lab report from the *Movement of Molecules Across the Membrane* investigation.
	+ In addition to including the actual lab report, include a 1-3 paragraph reflection that addresses the following points:
		- What were you most successful in doing during this investigation?
		- What were you less successful in doing during this investigation?
		- What will you differently during the next lab investigation to strengthen your research experience?
* **Evidence of the learning** **process –** Include successful completion of 12 activities to demonstrate the process you have participated in to understand this topic.
* **Reflection on class activities**— For **each** of the artifacts, write a thoughtful reflection that clearly explains how the activity supported your learning of the intended learning objectives.
* **(Optional) Reflection on biological experience outside of school**—If you have an opportunity to observe a biological situation outside of class that relates to this unit, you can include your reflections on that experience. Briefly describe your experience in one or two paragraphs and explain how this experience extends what we have learned in class.

## **How will your portfolio be graded?**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Mastered (x4) | Completed (x3)  | Developing (x2) | Beginning (x1) |
| Nature of Science (x2) | A **deep** understanding of how scientists work and communicate as it pertains to this unit is demonstrated. **Several specific** examples and **connections** are made to in-class research experiences and discussions | An understanding of how scientists work and communicate as it pertains to this unit is demonstrated. **Multiple** **specific** examples and **connections** are made to in-class research experiences and discussions | **Some** understanding of how scientists work and communicate as it pertains to this unit is demonstrated. **At least one specific** example and **connections** are made to in-class research experiences and discussions | **Very little** understanding of how scientists work and communicate as it pertains to this unit is demonstrated. Connections to in-class research experiences and discussions are **missing.** |
| Unit Summary (x3) |  **All** guiding questions are answered clearly and accurately. **All** terms and concepts are included correctly and underlined. | **Most** guiding questions are answered clearly and accurately. **Most** terms and concepts are included correctly and underlined. | **Some** guiding questions are answered clearly and accurately. **Some** terms and concepts are included correctly and underlined. |  **Few** guiding questions are answered clearly and accurately. **Few** terms and concepts are included correctly and underlined. |
| Evidence of the learning process (x3) | Material is used to clearly show a connection to the unit learning objectives. Students use a ***large*** variety of artifacts to show that growth is occurring.  | Material is used to clearly show a connection to the learning objectives. Students use a ***limited***number of artifacts to show that growth is occurring.  | Material that is used to show a connection to the learning objectives ***is unclear***. Students use a limited number of artifacts to show that growth is occurring. | Material shows ***little to no*** connection to the learning objectives. Students use ***only one kind*** of artifact to show that growth is occurring. |
| Reflections (x3) | ***Each*** artifact is accompanied by a reflection that clearly explains the connections to the learning objectives. | ***Most*** artifacts are accompanied by a reflection that clearly explains the connections to the learning objectives. | ***Some*** artifacts are accompanied by a reflection that clearly explains the connections to the learning objectives. | ***No*** artifacts are accompanied by a reflection that clearly explains the connections to to the learning objectives. |
| Review of Science Literature (x3) | An article discussing issues relevant to this unit is ***clearly*** summarized and includes ***highly*** thoughtful connections to class and personal experiences.  | An article discussing issues relevant to this unit is ***clearly*** summarized and includes ***moderately*** thoughtful connections to class and personal experiences.  | An article discussing issues relevant to this unit is summarized and includes ***minimally*** thoughtful connections to class and personal experiences.  | An article discussing issues relevant to this unit is ***not well*** summarized with ***little to no*** connections to class and personal experiences.  |
| Experimental Technique (x3) | A scientific investigation was personally carried out with ***strong*** evidence to show that it executed in a controlled and repeatable manner, appropriately analyzed, and ***thoroughly*** reflected upon to improve future experimentation.  | A scientific investigation was personally carried out with ***moderate*** evidence to show that it executed in a controlled and repeatable manner, appropriately analyzed, and ***thoroughly*** reflected upon to improve future experimentation.  | A scientific investigation was personally carried out with ***minimal*** evidence to show that it executed in a controlled and repeatable manner, appropriately analyzed, and ***somewhat*** reflected upon to improve future experimentation.  | A scientific investigation was personally carried out with ***little to no*** evidence to show that it executed in a controlled and repeatable manner, appropriately analyzed, and ***minimally*** reflected upon to improve future experimentation.  |
| Experiences outside of school (x2) | An experience ***highly*** relevant to this unit was experienced outside of class. Includes a ***thorough*** discussion that demonstrates several ***relevant*** connections to topics discussed in class and to personal experiences.  | An experience ***highly*** relevant to this unit was experienced outside of class. Includes a discussion that ***mostly*** demonstrates several ***relevant*** connections to topics discussed in class and to personal experiences. | An experience ***moderately*** relevant to this unit was experienced outside of class. Includes a discussion that ***minimally*** demonstrates ***a few*** ***relevant*** connections to topics discussed in class and to personal experiences. | An experience ***minimally*** relevant to this unit was experienced outside of class. Includes a discussion with little to no connections to topics discussed in class and to personal experiences. |
| Sharing of Portfolio (x2) | Student discusses portfolio contents with teacher and peers. Student is able to **clearly and accurately** articulate his/her understanding of learning objectives and his/her learning process throughout the unit.  | Student discusses portfolio contents with teacher and peers. Student is **mostly** able to clearly and accurately articulate his/her understanding of learning objectives and his/her learning process throughout the unit.  | Student discusses portfolio contents with teacher and peers. Student is **somewhat** able to clearly and accurately articulate his/her understanding of learning objectives and his/her learning process throughout the unit.  | Student discusses portfolio contents with teacher and peers. Student has **great difficulty** in clearly and accurately articulate his/her understanding of learning objectives and his/her learning process throughout the unit.  |
| Formatting | Portfolio includes a correctly titled title page and a table of contents that identifies all portfolio items and the corresponding page numbers. Portfolio is well organized and easy to follow. | Portfolio includes a title page and table of contents with corresponding page numbers, but includes **some minor noticeable errors**. Portfolio is **mostly** well organized and easy to follow. | Portfolio includes a title page and table of contents with **most of the** corresponding page numbers, and includes **many noticeable errors**. Portfolio is **not** well organized and easy to follow. | Portfolio is missing either/both a title page and table of contents with corresponding page numbers, and includes **noticeable errors**. Portfolio is **not** well organized and easy to follow. |
| Spelling and Grammar | There are few errors in grammar, capitalization, punctuation, and spelling. | There are ***noticeable*** errors in grammar, capitalization, punctuation, and spelling. These require ***minor*** editing and revision. | There are a ***large number*** of errors in grammar, capitalization, punctuation, and spelling ***requiring*** editing and revision. | The text is ***difficult to understand*** because of errors in grammar, capitalization, punctuation, and spelling. It requires ***major*** editing and revision. |