Title: Unit I: Basic Biological Principles **Subject/Course:** Biology

Topic: Science Process, Characteristics of Life, Cells Overview **Grade:** 10 **Designer(s):** Erin Gallagher

Stage 1- Desired Results

Established Goals:
Student knowledge & understanding of…

- Scientific problem solving skills
- Biological levels of organization and the relationships between levels
- Characteristics of life shared by all organisms

Anchor Descriptors:
BIO. A 1.1 Explain the characteristics common to all organisms.
BIO.A.1.2 Describe relationships between structure and function at biological levels of organization.
BIO.B Apply scientific thinking, processes, tools and technologies in the study of science

Eligible Content:
BIO.A.1.1.1 Describe the characteristics of life shared by all prokaryotic and eukaryotic organisms.
BIO.A.1.2.2 Describe and interpret relationships between structure and function at various levels of biological organization (i.e. organelles, cells, tissues, organs, organ systems, and multicellular organisms).

NGSS:
HS-LS1: From Molecules to Organisms: Structures and Processes
HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
Science and Engineering Practices:

- Developing & Using Models (HS-LS1-2)

Disciplinary Core Ideas:
LS1.A: Structure & Function
Crosscutting Concepts

- Systems & Systems Models (HS-LS1-2)

Transfer:

Students will be able to independently use their learning to…

- Apply scientific process/nature of science skills to scientific problems
- Apply knowledge of life characteristics to determine life
- Describe the interplay between organizational levels of living things

Meaning:

Understandings: *Students will understand that…* • Scientific processes and methodology enable scientists (and students) to determine solutions to problems. Application of science process clarifies understanding of the natural world • Life, from chemical compounds to organism to biosphere is highly organized, with relationships between levels. • The characteristics of life are common to all living things, from the simplest prokaryote to the most complex multicellular organism	**Essential Questions:** 1. What are the goals and processes of science? 2. What is scientific theory? 3. How do we apply the characteristics of life to determine what is living?
Acquisition:	
Students will know… • Overview of biology • Science process skills • Characteristics of life • Levels of organization of living things	*Students will be skilled at …* 1. Identify science process skills 2. Apply scientific method and experimental components to scientific problem scenarios 3. Identify the characteristics of life 4. Apply scientific process to determine life 5. Compare and contrast prokaryotic and eukaryotic cells 6. Explain levels of organization and their relationship
Stage 2- Assessment Evidence	
Unit-Based Project <u>Experimental Design & Characteristics of Life</u> Using components of science process and experimental set-up, students develop and hypothesis and design a controlled experiment to test the hypothesis.	**Other Evidence:** Chapter quizzes: • Science of Biology Unit Test: Science Process, Characteristics of Life, Biological Organization Laboratory Activities & Reports
Stage 3- Learning Plan	
Pre-Assessment	
Learning Events Vocabulary: <u>CH1:</u> *Science, observation, inference, hypothesis, controlled experiment, independent variable, dependent variable, control group, data, theory, bias, biology, DNA, stimulus, sexual reproduction, asexual reproduction, homeostasis, metabolism, biosphere* Vocabulary Lecture presentation/notes/discussion Animations/videos Chapter Section Assessment Questions	**Progress-Monitoring** ✓ Do Nows ✓ Vocabulary quizzes ✓ Classwork/homework check ✓ Online activities completion and accuracy check with discussion on results ✓ Accuracy of section and chapter review questions, guided reading handouts, chapter reading synopses ✓ Lab exercises execution &

Exercises: • Scientific scenarios • Graphic organizer (pyramid) for levels of organization • Poster/chart comparing living vs non-living according to life characteristics, with rationale Online activities/webquests • Scientific method webquest • Characteristics of Life webquest Laboratory Activities: • Scientific method lab activity • Characteristics of life lab activity Guided reading/Review handouts Chapter 1 Assessment Questions Chapter 1 Standardized Test Prep	data analyses ✓ Unit project progression monitoring
Technology • Laptops and Internet for online activities and project research • Powerpoint/LCD projector for lecture/discussion • Laboratory equipment & materials for lab exercises • Pearson Biology: eBook, online assignments, quizzes, tests, online activities, questions, presentations, animations • Text companion website: www.pearsonsuccessnet.com • Discovery Streaming, TeacherTube, various online sources for visuals, etc.	**Pacing Guide** September Chapters 1 & 7.1/7. Approx: 2 2 ½ weeks 1 day: Includes course overview, classroom protocols, safety, textbook distribution & layout, course expectations Review/reteach Unit test / Unit Project due