Unit 9: Animal Form and Function II
AP Biology

6 Class Meetings

Revised June 2019

Essential Questions

- How do the structures of animals serve their specific functions?

Enduring Understandings with Unit Goals

EU 1: Reproductive processes increase genetic variation among animals.

- Explain the process of sexual reproduction.
- Describe embryonic development, including cell division, specialization, and movement.

EU 2: The structure of neurons and their organization allows them to function in information transfer and communicate with other cells.

- Describe the transmission of information by signaling by neurons.

EU 3: Sensory receptors tuned to stimuli transfer information to the nervous system for processing and integration.

- Outline the steps involved in the reception, transduction, and transmission of information by sensory cells to the nervous system.

EU 4: Animals respond to their environment through motor mechanisms, including muscle contractions, that bring about behavior.

- Explain the mechanisms of movement and behavior in animals.
- Connect reproductive fitness and evolutionary success to the behavior of animals.

Standards

Next Generation Science Standards (NGSS):

- **HS-LS1-2.** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

Common Core State Standards:

- **RST.11-12.1** Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- **RST .11-12.8** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- **MP.2** Reason abstractly and quantitatively.
- **MP.4** Model with mathematics.

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MSMHS Academic, Civic, and Social Competencies

Competency 1. Read and write effectively for a variety of purposes.
Competency 2. Speak effectively with a variety of audiences in an accountable manner.
Competency 3. Make decisions and solve problems independently and collaboratively.
Competency 4. Apply scientific knowledge and concepts to a variety of investigative tasks.
Competency 5. Contribute to a positive learning environment with respect and responsibility.

Unit Content Overview

- Sexual reproduction
- Asexual reproduction
- Reproductive cycles
- Reproductive anatomy
- Gametogenesis
- Embryonic development
- Neuron structure and function
- Information processing
- Cellular communication
- Neurotransmitters
- Nervous systems
- The brain
- Sensory reception and transduction
- Hearing and vision
- Muscles and movement
- Skeletal systems
- Behavior
- Evolutionary history of behaviors

Interdisciplinary Connections

- Aquaculture: marine organism anatomy and systems
- Marine Studies 1: marine organism anatomy and systems
- AP Psychology: the brain, behaviors

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Daily Learning Objectives with *TWPS Activities*

Students will be able to…

- Compare and contrast sexual and asexual reproduction in animals.
    - *Why might using a hot tub frequently make it harder for a couple to conceive a child?*
- Describe the processes of conception and embryonic development in humans, utilizing reproductive anatomy vocabulary.
    - *If an STD led to complete blockage of both oviducts, what effect would you expect on the menstrual cycle and fertility?*
- Explain the ways neurons receive, retrieve, and transmit information based on their structures and locations.
    - *How is it possible for a particular neurotransmitter to produce opposite effects in different tissues?*
- Explain how sensory receptors and other stimuli transfer information to the nervous system.
    - *The human brain receives more action potentials when our eyes are exposed to light even though our photoreceptors release more neurotransmitter in the dark. Propose an explanation.*
- Describe the mechanisms of movement and locomotion in animals and analyze the evolutionary importance and history of behaviors in animals
    - *How could a learned behavior contribute to speciation?*

Instructional Strategies/Differentiated Instruction

- **HLP:** Academically Productive Talk
- **HLP:** Writing to Learn (TWPS)
- **HLP:** Effective Feedback
- Daily Warm Up Activities
- Power Point Lecture with note-taking
- Flexible grouping
- Foldables
- Exit slips
- Graphic Organizers

- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Student use of headphones
- Independent reading
- Outlining of text
- Reading and Accountable Talk Discussion of Text
- Laboratory exercises

Assessments

FORMATIVE ASSESSMENTS:

- Bioethics Opinion Paper
  - MSMHS Rubric 1: Literacy
- Close reading and interpretation of text
- Outlining of textbook
- Warm Up Activities
- Exit slips
- Oral questioning
- Accountable Talk Discussions
- Daily Think-Write-Pair-Share (TWPS)
- Daily check-ins with students
- Practice FRQs
- Practice MCQs
- Homework/Reading checks

SUMMATIVE ASSESSMENTS:

- Quiz on EU 1 and EU 2
- Quiz on EU 3 and EU 4
- Bioethics Opinion Paper
- Unit Test

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Unit Task

Unit Task Name: Bioethics Opinion Paper

Description: Students will use information from this unit and the last on human (and other animal) body systems (EUs 1-4 in Unit 9, EUs 1-4) to research answers and opinions to bioethics questions regarding human lives. Students will complete their research and then write a research paper detailing their findings. Students will detail both sides of the argument, and then take a stance defending one side over the other and supporting with facts from their research. Students will submit their notes from their research, a first draft, and a final copy of their papers. The papers will be scored and self-assessed using MSMHS Rubric 1: Literacy.

Evaluation: MSMHS Rubric 1: Literacy

Unit Resources

- Textbook (Biology in Focus AP Edition. Campbell et al. 2014. Pearson Education, Inc)
- Interactive Science Notebook
- MSMHS School-wide Rubrics
- Lab Supplies
- Graphing calculators
- Internet databases
- Laptops