Unit 7: Echinodermata and Embryology

Big Idea:

- Observing echinoderm fertilization and embryonic development allows for greater understanding of human embryology

Essential Questions:

- What are the major characteristics of echinoderms?
- What are the classes of echinoderms?
- What are local examples of echinoderms?
- What are adaptations of sea urchins?
- How is urchin fertilization and embryology similar to mammalian fertilization and embryology?
- What are the basic embryonic phases of development?
- How does vertebrate embryology compare to invertebrate embryology?

Vocabulary: Echinoderm, Asteroidea, Echinoidea, Holothoroidea, Aristotle's Lantern, pedicellariae, spawn, sperm, egg, gametogenesis, oogenesis, spermatogenesis, polyspermy, blastula, gastrula, invagination, differentiation, archenteron

NGSS Priority Standards

HS-LS1-1 Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2 Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-3 Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS2-8 Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

HS-LS4-1 Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

HS-LS4-3 Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait

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Common Core Math and ELA
Common Core State Standards Connections:
ELA/Literacy -

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.

WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

SL.11-12.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

Mathematics -

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.