Name: Due Date: TA:

# Life Sciences 11

# LG 19

## *Phylum Echinodermata*

Phylum Echinodermata introduces us to a unique group of marine invertebrates that challenge many of the patterns we see in other animal groups. Found exclusively in ocean environments, echinoderms such as sea stars, sea urchins, sand dollars, and sea cucumbers display a fascinating mix of simplicity and complexity. At first glance, they may appear slow-moving or even plant-like, but these organisms possess highly specialized systems that allow them to survive, feed, and interact with their surroundings in remarkable ways.

All echinoderms share several defining characteristics, including a spiny skin, an internal skeleton made of calcium carbonate plates, and a unique water vascular system. This hydraulic system powers tube feet, which are used for movement, feeding, and gas exchange. Another unusual feature is their radial symmetry as adults (typically in multiples of five) despite having bilateral symmetry during their larval stage. This shift in body plan highlights an interesting evolutionary pathway that sets them apart from many other animals.

Echinoderms also demonstrate impressive abilities when it comes to survival. Many species can regenerate lost body parts, and some, like sea stars, can regrow entire limbs or even most of their bodies if damaged. Their feeding strategies are equally diverse: sea stars can pry open shellfish, sea urchins graze on algae using specialized mouthparts, and sea cucumbers process sediment on the ocean floor. These adaptations allow echinoderms to play important roles in maintaining the balance of marine ecosystems.

Studying echinoderms helps us understand evolutionary innovation, particularly in body symmetry, locomotion, and internal support systems. They also provide insight into how organisms can be highly specialized for life in a single environment while still achieving widespread success. Despite their often slow and steady lifestyles, echinoderms are vital to ocean health and biodiversity. They remind us that life beneath the waves can be just as complex and dynamic as life on land. Why did the sea cucumber blush? Because it saw the ocean's bottom!

***LG 19 Hints:*** *Read the assigned sections carefully and* ***take detailed notes as you go****. A portion of (LG) mark will be based on the notes you submit.*

*Reading and taking organized notes helps you to process information, so focus on identifying the most important ideas rather than copying everything word-for-word. Aim to summarize key concepts in your own words. A helpful strategy is to use clear headings and subheadings to organize your notes. This can make the material easier to review later. Ultimately, choose a note-taking style that works best for you, but make sure your notes are clear, organized, and show thoughtful engagement with the reading.*

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**Instructions: Use your Biology 11 Life Sciences textbook to complete the sections below.**

You can also use the following link:

https://www.thssscience.com/resources/Biology%20Miller%20Levine%20Chapter%2029.pdf

**1. Read pages 636-644**

a) Take notes on the above reading.
b) Answer questions 1-3 on page 644

**2. Read pages 645-646**

a) Take notes on the above reading.
b) Answer questions 1-2 on page 646

**3. Complete questions 1-8 (multiple choice) on page 650**

**4. Read pages 652-668**

a) Answer questions 1-5 on page 668

**5. Watch the BlueWorldTV video on invertebrates before completing this guide.**
**Title: The Spiny World of Echinoderms! | JONATHAN BIRD'S BLUE WORLD**

https://www.youtube.com/watch?v=zcaP520ygt0

a) List 2 interesting facts you learned from the above video