Name _____

Echinoderm Activity

We have been discussing echinoderms in class. Echinoderms are a phylum of marine invertebrates. "Echino" means spiny while "derm" means skin. There are 5 major classes of echinoderms: Asteroidea, Holothurodiea, Echinoidea, Ophiuroidea, and Crinoidea.

PART 1: Sorting Cards

Directions: On the table you will find an envelope filled with cards. Lay out the cards onto the table and examine them for a few minutes. Next sort the cards into the 5 groups or classes. Once you have sorted the cards out into classes, answer the following questions.

1. Match the following classes with the correct group of organisms (feather stars/sea lilies, sea cucumbers, brittle stars, sea urchins/sand dollars/sand biscuits, sea stars).

a. Asteroidea _____

b. Holothuroidea _____

- c. Echniodea _____
- d. Ophiuroidea _____
- e. Crinoidea _____

2. Once you have guessed on the classes of organisms above, obtain a copy of the posters from your teacher and check your answers.

3. a. Do all of the sea stars have 5 rays (arms)?

b. If not, identify a sea star that has more than 5 rays.

c. How many rays does this organism have? _____ (This sea star can grow up to 3 meters in diameter)

4. a. Do any sea stars look like they do not have any rays?

b. If so, identify the sea star _____

5. Find the 2 cards with the crown-of-thorns sea star. Do they have the same number of rays?

6. Some sea cucumbers have feathery gills that protrude out from their bodies. Find these cards and draw what one of them looks like in the space below.

7. Find the orange basket star. How many rays does this star have? _____ (HINT: Look closely)

8. Compare the fossilized brittle star with the living brittle stars. Do they look any different?

9. Compare the fossilized sea urchin with the living sea urchin. Do they look any different?

10. Find the sea urchin with the "test". What is the test? What do you think the function of a test is?

11. Feather stars might look like underwater ferns, but they are animals, not plants. Find the feather stars card. **Describe** why they are considered animals and not plants.

12. Echinoderms that have long arms with small bristles or feathers will usually be filter feeders, using their arms to gather small particles from the water.

a. Find all of the cards that you think look like a filter feeder. (NOTE: the crown-of-thorns is a carnivore). How many cards did you select?

b. List 2 characteristics that are similar among all of the cards you selected.

13. Now arrange the cards by sorting them into color. Animals that are more than one color can form a group (In other words, make pile for 2-color creatures, one for 3-color creatures, etc...). Put the fossils into their own group.

a. Which group was the biggest? _____

b. Which group was the smallest?

c. Do you think there is a benefit to have more than one color? Explain your answer.

d. Most of these creatures are bright in color. Do you think this helps the echinoderms? Why or why not?

PART 2: Echinoderm Specimens

At the back lab table, there preserved echinoderms. Take a look at them, pick them up, etc.. (NOTE: DO NOT OPEN THE JARS). In the space below, write 2 similarities and 2 differences that you can see among the specimens.

PART 3: Anatomy of a Sea Star

In the diagram below, identify the following structures. You can use Figure 7.44 in your textbook on page 141. *NOTE: There are not lines or letters for all of the structures you are to identify.*

Structures to identify: *Ampullae, Anus, Arm (ray), digestive gland, digestive system, gonad, mouth, radial canal, ring canal, stomach, tube feet, water vascular system.*



Directions: Using the letters in the picture above, match the description with the structure.

1. The anus is found on the top of a sea star, this is where wastes are removed.

2. The mouth is on the opposite side of the anus, food is taken in here:

- 3. Large and centrally located between the mouth and anus is the stomach, where food is digested: _____
- 4. The ring canal surrounding the stomach, part of the sea star's water vascular system: _____

5. The radial canal extends from the ring canal and into the sea star's arms, also part of the vascular system: _____

- 6. Attached to the radial canal are the tiny tube feet with suckers: _____
- 7. Digestive glands are located within the arms of the sea star, chemicals help break down food:

CONTINUE ON BACK

PART 4: Anatomy of a Sea Urchin

In the diagram below, identify the following structures. You can use Figure 7.48 in your textbook on page 143. <u>NOTE: There are more numbers than needed for all of the structures you are to identify.</u>

Structures to identify: *Ampullae, Anus, Arm (ray), digestive system, esophagus, gonad, intestine, mouth, radial canal, ring canal, test, tube feet, water vascular system.*



- a. What numbers represent Aristotle's Lantern?
- b. What is the function of Aristotle's Lantern?