

OIMB GK12 CURRICULUM

1st Grade

30-45 minutes

Echinoderms (Sea Stars)

Oregon Science Content Standards:

- 1.1 Structure and Function: Living and non-living things have characteristics and properties.
- 1.1L.1 Compare and contrast characteristics among individuals within one plant or animal group.
- 1.2 Interaction and Change: Living and non-living things interact.
- 1.2L.1 Describe the basic needs of living things.
- 1.3 Scientific Inquiry: Science explores the natural world using evidence from observations.
- 1.3S.1 Identify and use tools to make careful observations and answer questions about the natural world.
- 1.3S.2 Record observations with pictures, numbers, or written statements.

Ocean Literacy Essential Principles:

- 5. The ocean supports a great diversity of life and ecosystems

Goal: To introduce students to sea stars and their morphology.

Concepts:

- Sea stars are one group of invertebrates that can be found at the rocky shore.
- There are many different types of sea stars that differ in color, shape, and size.
- Sea stars are echinoderms, so have tube feet, radial symmetry and spiny skin.
- A sea star's body parts are adaptations for sticking to rocks, moving, feeding, protection, and breathing.
- Sea stars can regenerate their body parts.

Materials:

- Sea Star PowerPoint
- Sea Star Parts Checklist
- If using live animals, get as many different kinds of sea stars as possible; a cooler, some clear containers to display the sea stars, seawater

Lesson Plan:

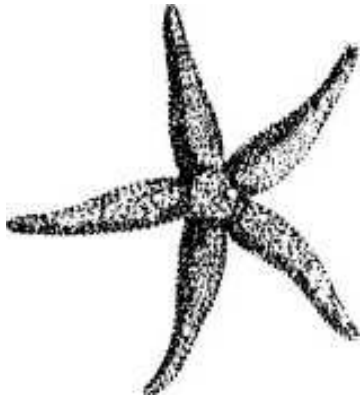
1. If this is the first time talking about Echinoderms, see the lesson called Echinoderms (sand dollar/sea urchin comparison) for an introduction to this group. Otherwise, ask the students to remind you why sea stars are in the same group as sea urchins and sand dollars (they have: radial symmetry, spiny skin and tube feet). Ask them why we call them sea stars instead of starfish (they aren't fish). Remind them that echinoderms are a group of invertebrates, so like all invertebrates, have no backbone.
2. Show the PowerPoint and talk about the following things:

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- Talk about how sea stars can push out their stomachs to cover their prey or stick into their prey (e.g. into larger mussel shells). Their stomach juices turn the prey into liquid that they absorb. Sea stars can also swallow small prey, like small mussels and sea urchins, in one gulp.
 - Ask the students what sea stars' tube feet do and where they are located on the sea star. They have tube feet only on the underside of their arms/rays. The tube feet are used for locomotion, passing food to their mouth, sticking to rocks, breathing and smelling. (The tube feet are part of a water vascular system, which creates suction by pumping water. The water taken in carries oxygen and chemicals/odor sources.)
 - Ask the class if sea stars have eyes. Explain that they do not have eyes like ours, but have an eye spot on the tip of each arm/ray. These eye spots cannot see colors, just light/dark.
 - The pore on top of a sea star's body is for sucking in additional water, providing oxygen so the sea star can "breathe". (The pore, called a madreporite, is connected to the water vascular system.)
 - Describe how a sea star can regenerate, grow back, a ray. If a predator bites off a ray, for example, the sea star can grow another one.
 - Ask the class if all sea stars have 5 arms/rays. No. Some sea stars can have over 20 rays! Explain that there are many different kinds of sea stars.
3. Now draw a picture of a sea star on the board, and ask the students where the mouth would be (in the middle of the ventral, or bottom side).
 4. If you have live animals, split the class into groups and have them rotate to stations with different types of sea stars, making sure they point out their characteristics (tube feet, pore, spines (bumps), mouth, and eyespots). You can have the students check off the parts on the worksheet if desired. If you do not have live animals, you can use the pictures from the PowerPoint and have students come up and point to the different parts. Additionally, pictures or videos from arkive.org can be used.

Assessment: Ask the students to point out the parts of sea stars.

GK12 Fellows: Maya Wolf, Erin Morgan (worksheet)



Spines

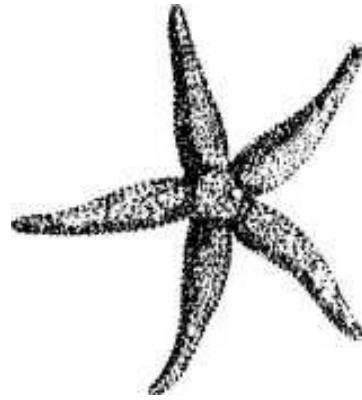
Eyespots

Tube feet

Arms

Mouth

Pore



Spines

Eyespots

Tube feet

Arms

Mouth

Pore