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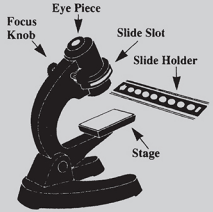
MICRO-SLIDE-VIEWER™



Face the Micro-Slide-Viewer so that as much light as possible falls on the white Stage.

Insert the numbered end of the Slide Holder into the Slide Slot of your Viewer, moving it from your right to left.

View with your eye close to the Eye Piece.

With Slide No. 1 in place, focus by turning the Focus Knob.

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ahtah), which means "bumpy skin". Their relatives include sea urchins, sea cucumbers, and sand dollars.

In the slide you see a starfish being pulled away from a clam it was trying to eat. *Do you notice any structures attaching the starfish to the clam?* Those structures are "tube feet". It is possible for a starfish to have hundreds of these tube feet.

The only animals in the world that have these tube feet are the groups that belong to Phylum Echinodermata. This means of locomotion is one of their major advantages over earlier animals. *How many tube-feet can you see in the slide?*

These tube feet do not work by muscle power. They work by a "water-suction" system that permits them to attach and let go. The tube feet can be used to attach to rock, to move a little bit (slowly), and to pull apart oyster shells for food.

The echinoderms do not have complex brains or eyes. But they do have tube feet.

7 FEATHERWORMS (1/2x)

This slide shows a featherworm surrounded by tiny red crabs. With its body sheltered within its tube, the worm extends its "feathers" into the water. *Are they really "feathers"?*

What do you suppose these structures do? What does this worm probably use as food? If this worm is threatened with danger, what do you suppose its response might be? (Scientific researchers have found these creatures valuable to study because of their very quick reflexes.)

These worms are commonly found in among the stony parts of a reef system, but their small size makes them easy to overlook. And since the animal's body cannot be seen, their "flower-like" appearance can be deceiving at first.

8 SHARK SCALES (13X)

Sharks have a very fearsome appearance in the sea. Certainly the many rows of jagged teeth in their mouths does little to lessen that appearance.

Most people are surprised to learn that the shark's body is *also* covered with "teeth". This slide shows some of these body-covering "teeth." They are its SCALES. These sharp, tooth-like scales are called PLACOID (Plack-oid) scales. They are characteristic of sharks and their close relatives.

They are also called "dermal denticle" (durm-al dent-ih-cull). This means "*skin tooth*." They don't just look like teeth. They actually have dentine contained inside them; just like the teeth in your own mouth do. This explains why a shark's skin feels so rough. It almost feels like coarse sandpaper as you run your hand forward along its body.

The shark's skin can be used to make a type of leather. The oils in its liver can be used as a source of vitamin A. Some sharks can be used for food. Their skeletons are made of CARTILAGE (Kar-tuh-lihge). This is the same material that football players sometimes injure in their knees and which gives each person's nose its individual shape.

The sharks belong to Class Chondrichthyes (kon-drick-these).

Photomicrographs #1, 2, 3, 4, 5 8 A.M. Siegelman; 6 Dr. J.D. Cunningham; 7 Dr. J. Metzner

MARINE BIOLOGY

INTRODUCTION

If you looked at our planet from space, you would see that most of it is covered with water. In fact, 77% of the earth's surface is covered with water. Most of this is salt water. It is not surprising that some scientists think we should change our name to "Planet Ocean".

The Pacific Ocean (all by itself) is larger than all the continents of the earth combined. If we flattened all the mountains and filled in all the valleys, there would be no land at all. The entire earth would be covered with ocean waters.

These oceans are important to humans. They produce most of the oxygen we breathe. They help keep our planet from becoming too hot or too cold. They provide us with food. They provide us with medicines. Life itself may have originated in the sea. Evidence suggests that land animals have evolved from oceanic ancestors. Even our body fluids - our blood, our sweat, and our tears - are still salty, perhaps recalling our oceanic beginnings.

Scientists who study the sea may study whales - the largest animals that have ever lived. Scientists also may study tropical coral reefs. These reefs are built by organisms that look like plants - yet they really are animals. They may study sharks or jellyfish; fish that glow in the dark or stingrays, seabirds, or walruses, or sand dollars.

As you study this set, keep in mind that on most planets, there is no water at all. And even on our own, we are lucky to have our water in its liquid condition. If we were a little closer to the sun, water would boil away as a gas. If we were a little further from the sun, it would be solid ice. Our oceans make our planet very unusual. The magnification given (for example, slide 1 - 50x) means that the microscope was set on that power when the photograph was taken.

1 PHYTOPLANKTON (50X)

These microscopic plants are PHYTOPLANKTON (Fye-tow-plank-ton). The ocean does not have trees, forests, and prairies. Most of its plants are phytoplankton like these. Too small to see without a microscope, they float near the ocean's surface. They drift wherever the tides and currents may carry them.

Normally, you can't see them. But without them, the seas would die. They produce most of the food in the sea by capturing the energy of sunlight. (they also produce up to 80% of the oxygen that you and I breathe.) They are such an important source of food for whales and sharks and sponges and corals, that they have been nicknamed "The Pastures Of The Sea."

Usually phytoplankton are helpful. But sometimes some of them can become killers. This happens when they have population explosions called "red-tides". Red-tides can kill fish, sharks, and even sea turtles.

Other phytoplankton can cause the ocean to glow and sparkle in the dark. They phytoplankton you see here care called DIATOMS (Die-ah-toms).

By Randolph H. Femmer