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The Chambered Nautilus

One of the most beautiful and ancient creatures in the sea, the chambered nautilus, is also an example of one of the most interesting stories of how animals move through their liquid environment. The chambered nautilus has survived from the Cambrian Period over 500 million years ago, 265 million years before the dinosaurs lived on the earth, and is considered a living fossil. Fossils have been uncovered that look almost the same as the living animal living deep in the tropical oceans of the world today.

The chambered nautilus belongs to a group of animals scientists classify as cephalopods, which includes octopus, cuttlefish, and squid. Cephalopods have large heads and developed eyes, but in classifying animals, there are always differences. The chambered nautilus has a large head, but its large eyes are misleading. The large eye is not well developed and acts much like a pinhole camera. A pinhole camera, written about as far back as 300 B.C. by the ancient Greeks, has an extremely small hole that brings images through one small point. The animal squints to get a better picture, reducing the amount of light coming in. The eyes do not have lenses.

A chambered nautilus has more than ninety tentacles coming from its head, but they do not have suckers as do the tentacles of an octopus. Instead, they are sticky at the end to capture prey. They usually hunt small invertebrates they bring to their beaks and crush before eating.

There are only six kinds of chambered nautilus that live in the deep, tropical waters. During the day, a chambered nautilus rests on the seafloor either holding onto the bottom using its many tentacles for grip or resting while its body is retracted inside its shell. If it needs to move about in the ocean, it swims as does the octopus and the squid by contracting its body inside its shell and forcing water out of its head cavity, propelling itself backwards.

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The Chambered Nautilus (Cont'd)

At night when it feeds in shallower water towards the surface of the ocean, it releases gas into its chambers forcing the water out which makes the animal lighter, causing it to rise to the surface. When daylight comes, the chambered nautilus replaces its chambers with water and it sinks back down to the bottom of the ocean. This concept was used in designing submarines. It is not a coincidence that the first American submarine with nuclear propulsion was named Nautilus. In the book, "Two Thousand Leagues Under the Sea", Jules Verne also named the ship diving to the depths of the ocean the Nautilus.

Architects and artists have long admired the chambered nautilus for its beauty and design. The outside, smooth shell is cream-colored and striped in brown. As the animal grows and needs new living space, a new chamber is developed that is larger. The chambered nautilus only occupies the latest, largest chamber. What is intriguing to the architect and the artist is that the animal grows its new chamber in a growth spiral which often occurs often in nature such as the spiral of our Milky Way Galaxy, an the spirals of hurricanes and spider webs. However, in the case of the chambered nautilus, the spiral increases in a measurable proportion between each chamber fascinating people who love the intricate design.

These unique animals are a favorite among shell collectors and therefore the commercial shell trade. Conservation measures are needed especially since the animal has a slow rate of reproduction. It is illegal to export nautiluses in Indonesia, but it is still legal to capture live nautiluses for their shells in Fiji and the Philippines. Its natural predators are octopus, sharks, triggerfish, and turtles, but by far, their biggest threat of extinction is from man.

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The Chambered Nautilus Vocabulary Development

Using the following pages, write a definition for each word below:

chamber

tentacles

spiral

invertebrates

cephalopods

retracted

classification

fossil

proportion

propelling

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The Chambered Nautilus Definitions

1. causing a course of action

2. ocean animal with large head and tentacles such as octopus, squid, and cuttlefish

3. remains of an animal or plant from a different era

4. relationship of size between two or more things

5. to withdraw, to draw in

6. an enclosed space or compartment

7. a series of curves that increase in size circling around a central point

8. long, flexible organs around the mouth or head of some animals

9. putting items into groups according to types

10. animals without backbones

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The Chambered Nautilus Questions

Answer the following questions using complete sentences.

1. What are two features of cephalopods?

2. Name two other examples of cephalopods.

3. In what part of their shell does a Chambered Nautilus live?

4. How far back in time can we trace the history of the Chambered Nautilus?

5. Name two other examples of growth spirals that occur in nature.

6. Briefly describe how a chambered nautilus rests on the ocean floor.

7. Briefly describe how a chambered nautilus moves back and forth between the ocean floor and the shallower water where it feeds.

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The Chambered Nautilus Answers

(Answers should contain important points)

1. Cephalopods have large heads and large eyes.

2. Cephalopods include octopus, cuttlefish, and squid.

3. They live in the most recently developed, larger, outer part of their shell.

4. Scientists have found fossil remains dating back to the Cambrian Period, 500 million years ago.

5. Other growth spirals occurring in nature include spider webs, hurricane spirals, and the Milky Way galaxy.

6. A chambered nautilus either rests on the seafloor using its tentacles to grip or it contracts its body into its shell.

7. A chambered nautilus increases or decreases gas into its chambers allowing water to flow in or flow out increasing or decreasing the amount of water, so it is heavy or light.