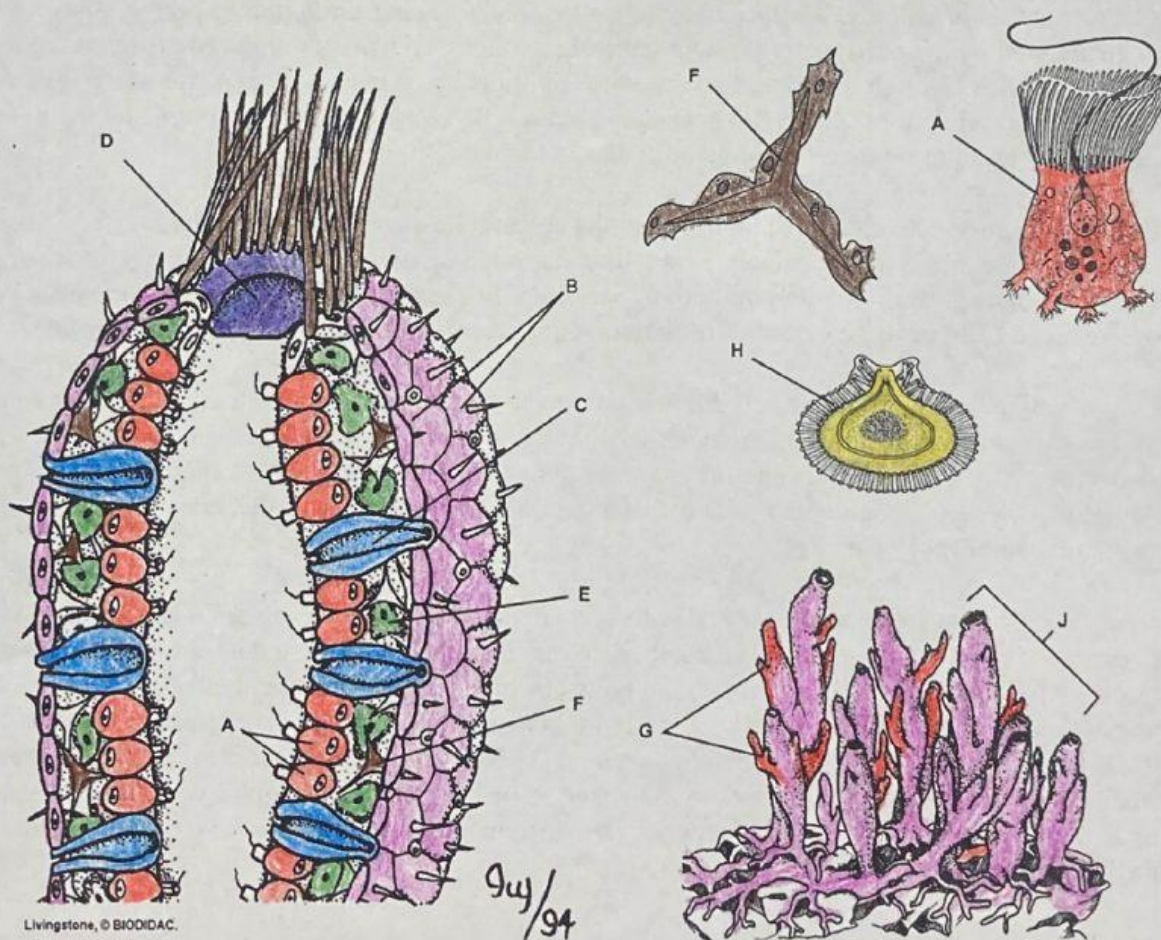


Letter	Structure	Function	Color
A			Red
B			Dark Blue
C			Yellow
D			Green
E			Purple
F			Orange
G			Brown
H			Light Blue
J			Pink



Livingstone, © BIODIDAC.

Sponges - A Coloring Worksheet

Sexual reproduction occurs when one sponge releases sperm (modified collar cell) into the water. This sperm travels to another sponge and fertilizes its eggs. The larva form will then swim to another location using its flagella where it will grow into an adult sponge. Most sponge species are hermaphrodites, they can produce both eggs and sperm.

Since sponges look like plants, it is understandable why early biologists thought they were plants. Today, we know that sponges are simple, multicellular animals in the Kingdom Animalia, Phylum Porifera. This phylum is thought to represent the transition from unicellular animals to multicellular animals. Most (but not all) sponges are asymmetrical and have no definite shape. Sponges, like all animals, are eukaryotic - meaning their cells have a nucleus. Porifera in Latin means "pore-bearer" and refers to the many pores or openings in these animals. Because of these pores, a sponge can soak up and release water. At one time, real sponges were used for cleaning and bathing. Today, most are artificially made.

All adult sponges are sessile, meaning they are attached to some surface. Since they cannot move, sponges cannot pursue their food. Instead, they are filter feeders, meaning they obtain their food by straining the water for small bits of food like bacteria, algae or protozoans.

Sponges exhibit less specialization (adaptation of a cell for a particular function) of cells than most invertebrates. The primitive structure of a sponge consists of only two layers of cells separated by a non-living jelly like substance. The outer layer of the sponge is the epidermis which is made of flat cells called pinacocytes. Color all the **pinacocytes (B) dark blue**.

The inner layer consists of collar cells whose function is to circulate water through the sponge. They do this by swishing their flagella which pulls water through the **ostia** - water then travels out the **osculum** at the top of the sponge. As water passes through the sponge in this way, cells absorb food and oxygen and waste is excreted. Color the **collar cells (A) red, osculum (D) green, and ostia (C) yellow**. Color the **spongocoel** the inside of the sponge where water circulates whatever you would like and label.

In the jelly-like substance between the epidermis and the collar cells are cells called amoebocytes - because they look like amoebas. The job of the amoebocytes is to travel around distributing food and oxygen to the cells of the epidermis as well as play a role in repair and regeneration. Because of the amoebocytes, scientists believe that sponges evolved from protists. Color all of the **amoebocytes (E) purple** - look for them carefully.

The body of the sponge would collapse if it did not have some type of supporting structure. Some sponges have a soft network of protein fibers called spongin. Others have tiny, hard particles called spicules. Many of these spicules also stick out of the epidermis and provide the sponge with protection. Most sponges have a combination of spicules and spongin, the ratio often determines how soft or hard the sponge is. Search for and color all the pointy **spicules (F) orange**.

Reproduction for sponges can be accomplished both sexually and asexually. There are a couple of ways for a sponge to reproduce asexually: budding, regeneration/fragmentation and forming gemmules. Sponges can simply reproduce by budding, where a new sponge grows from older ones and eventually break off. Color the **adult sponge (J) pink** and all the **buds (G)** you can find **brown**. Sponges can also reproduce by regeneration, where missing body parts are regrown. People who harvest sponges often take advantage of this by breaking off pieces of their catch and throwing them back in the water, to be harvested later. Finally, sponges can reproduce by creating gemmules - which is a group of amoebocytes surrounded by a hard outer covering. Color the **gemmule (H) light blue**.