

Cnidarians Fact Sheet

Animals of the phylum Cnidaria have many body shapes and ways of living. For example:

- **Corals** are cnidarians that live in **colonies**. About 800 species are known that create hard reefs. These are critically important areas for **biodiversity** around the world.
- Corals create their rock-like skeletons by secreting calcium carbonate. Many other species of “soft corals” live in colonies with a plant-like appearance. Coral colonies usually have hundreds of thousands of individual organisms.
- The body plan of **jellies** is like a **sea anemone** that has been turned upside down. This diverse group of cnidarians thrives at all depths of the ocean.



Corals are the foundation of diverse reef ecosystems. The soft red corals shown here add splashes of color.

Photo by Lpittman, Pixabay

Life Cycle and Body Forms

Cnidarians come in two different body forms:

- The stationary (**sessile**) form, called a **polyp**
- The free-swimming form, called a **medusa**

Each individual coral animal is a polyp. Corals, sea anemones, and **hydras** are polyps during their entire lives.

Many cnidarians alternate between the two forms during their lives. The medusa is the adult. Adult jellies can release sperm and eggs. Fertilized eggs become tiny sessile polyps, which bud off new jellies asexually.



A moon jelly in its medusa form

Cnidarian Structures

- **Muscles + Nerves**

Scientists believe that **cnidarians** were the first animals to have **muscles** and **nerves** to produce behavior. Their simple **nervous system** is made up of a **nerve net** which transmits messages between the muscle cells, causing them to contract.

One genus of anemones, *Stomphia*, can actually swim away from predators by contracting its entire body:

shapeoflife.org/video/cnidarians-anemone-swims-away-sea-star.



A *Stomphia* anemone contracts its muscles to swim away from a starfish.

- **Mouth + Stomach**

Scientists also believe that cnidarians were the first animals to have a mouth and stomach to digest food. In the polyp form, **tentacles** ring the mouth at the top of the bag-like stomach, called a **gastrovascular cavity**.

The top of jellies in their medusa form covers the tentacles and mouth. The mouth leads up to the gastrovascular cavity. Waste products also leave the body through the mouth in most jellies.

By filling the cavity with water and tightly closing their mouths, cnidarians give their bodies structure without a true skeleton or shell.

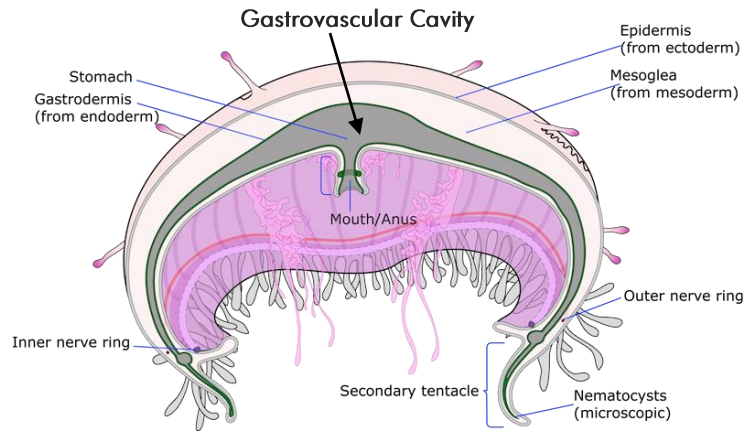


Diagram of a jelly in its medusa form
Created by Mariana Ruiz Villarreal, [Wikimedia Commons](https://commons.wikimedia.org/wiki/File:Jellyfish_cross-section.png)

- **Nematocysts**

All cnidarians are **predators**. Their tentacles and bodies are covered with stinging cells called **cnidocytes**. These cells contain **nematocysts** that are ejected harpoon-like to capture prey or for protection. Often barbed and delivering toxins, nematocysts are usually triggered by touch. Chemicals can also cause them to fire on rare occasions.



Nematocyst animation in
"Cnidarians: Anemone Catches Goby":
shapeoflife.org/video/cnidarians-anemone-catches-goby

Deep-Sea Cnidarians

- Cnidarians are among the most common animals of the deep sea, Earth's largest ecosystem. They play crucial roles there, including creating habitats.
- All deep-sea cnidarians combined are one of the largest living biomasses on the planet.



Tentacles of these anemones contain nematocysts that catch prey.

Learn More with Shape of Life Videos

- "Cnidarians: Life on the Move": shapeoflife.org/video/cnidarians-life-move
- "Cnidarians: Anemone Catches Goby": shapeoflife.org/video/cnidarians-anemone-catches-goby
- "Cnidarians: Anemones Fight": shapeoflife.org/video/cnidarians-anemones-fight
- "Cnidarians: Anemone Swims Away From Sea Star": shapeoflife.org/video/cnidarians-anemone-swims-away-sea-star
- "Cnidarian Animation: Anemone Body Plan": shapeoflife.org/video/cnidarian-animation-anemone-body-plan
- "Cnidarian Animation: Polyp and Medusa": shapeoflife.org/video/cnidarian-animation-polyp-and-medusa
- "Cnidarians: Moon Jelly Life Cycle": shapeoflife.org/video/cnidarians-moon-jelly-life-cycle
- "Nematocyst Animation: Feeding Tentacles": shapeoflife.org/video/nematocyst-animation-feeding-tentacles