

# SEA STARS

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## SCIENTIFIC CLASSIFICATION

<b>COMMON NAME:</b>	sea stars
<b>KINGDOM:</b>	Animalia
<b>PHYLUM:</b>	Echinodermata
<b>CLASS:</b>	Asteroidea
<b>ORDER:</b>	
<b>FAMILY:</b>	
<b>GENUS SPECIES:</b>	At least 1,500 species

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## FAST FACTS

<b>DESCRIPTION:</b>	Sea stars are star-shaped, free moving echinoderms. The body is composed of rays, projecting from a central disc. They are commonly red, orange, blue, purple, green, or have a combination of colors. Most sea stars have 5 rays ranging in length from 10 to 25 cm (4–10 in.). Some species may be much larger and have more than 5 rays; the sunflower star has 26 or more rays and often reaches 1 meter (3 ft.) in diameter.
<b>SIZE:</b>	0.02 to 1 m (0.07–3.3 ft.)
<b>LOCOMOTION:</b>	All sea stars used their tube feet for locomotion. The tube feet are in grooves on the undersides of each arm. They operate on a water vascular system.
<b>DIET:</b>	Bat stars are scavengers, feeding on algae and detritus or they are predators. Giant-spined sea stars are predators that feed mainly on clams, oysters, and other molluscs. Ochre stars mainly eat mussels and other molluscs.
<b>FEEDING:</b>	A sea star's mouth is located on the oral surface (underside). A sea star feeds by a process called evagination — it everts its stomach through its mouth, pushing it outside the body wall.

Stomach enzymes then digest the food externally. When digestion is complete, the stomach is retracted back into the body cavity.

<b>REPRODUCTION:</b>	Most sea stars are either male or female. They release eggs and sperm into the water where fertilization takes place. Sea stars usually spawn once a year. Those that live in temperate waters spawn in the spring. A female may release up to 2.5 million eggs.
<b>RESPIRATION:</b>	Oxygen exchange takes place at the tube feet and at papulae, tiny bumps scattered over the aboral surface.
<b>LIFE SPAN:</b>	Up to 35 years
<b>RANGE:</b>	All oceans
<b>HABITAT:</b>	Benthic habitats including tide pools and pier pilings.

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## FUN FACTS

1. Echinoderm is a Greek word meaning “spiny-skinned.” Animals in the phylum Echinodermata all share a few common characteristics:
  - Endoskeleton (internal skeleton) – made up of ossicles, a type of calcareous structure
  - Tube feet
  - Radial symmetry in adults – the adult body symmetry radiates around a central axis. The pattern of symmetry is pentamerous—it occurs in five or multiples of fives.
2. At the tip of each arm is one tube foot that cannot be retracted. This is a tactile organ. Just above the tactile organ is a small white eyespot that detects changes in light intensity. When searching for food, the sea star relies on chemoreception, a combined sense of taste and smell.
3. Sea stars regenerate lost rays. Regeneration is typically slow and may take as long as one year. Some stars may have six or seven rays because two rays may regenerate instead of one.
4. The ochre sea star is more tolerant of exposure to air than other *Pisaster* species. They regularly withstand up to 8 hours of exposure during low tides. In laboratory conditions, they have tolerated up to 50 hours out of the water with little harm. They cannot tolerate high water temperatures or low oxygen levels.
5. Bat stars have short webbed arms reminiscent of the wings of bats, thus giving rise to their common name. Colors range from solid red to mottled yellow, orange, or brown. The wide color variation is due to genetics.
6. Some sea stars, such as the giant-spined sea star, have pedicellariae—tiny pincherlike structures covering their aboral (top) surface. Pedicellariae help grind algae and other tiny pieces of debris that collect along the skin of the sea star.
7. For more information visit the Tide Pool Infobook.

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## **ECOLOGY AND CONSERVATION**

The toxic crown-of-thorns sea stars are predators that can wipe out large areas of coral reefs; an individual can consume up to 6 square meters (64.6 ft<sup>2</sup>) of living reef per year. Outbreaks of the species can occur when ocean temperatures and nutrient levels increase.

Many other sea stars are top predators and play important roles in ecosystems.

Beachcombers, tidepoolers, and divers must remember not to disturb or collect any specimens that they may encounter. The removal of animals from an ecosystem may disrupt ecological processes and decrease the diversity in areas that are frequently visited. Because of their specific nutritional and physiological needs, certain animals, such as sea stars have a much better chance for survival in their natural environment than in an unregulated home aquarium.

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