Camouflage Wizards

By Kira Freed

If someone asked you to think of a few animals that use camouflage, which ones would come to mind? Chameleons and leopards, and perhaps polar bears? Would you believe that octopuses and their close relatives belong at the top of the list?

Octopuses, squid, and cuttlefish are all members of an animal group called coleoids (KO-lee-oids). These ocean **creatures** are all mollusks, a much larger animal group that also includes snails, slugs, and clams. Unlike many mollusks, coleoids have no outer shells. All coleoids have a head, a mantle (a large, muscular "wall" of skin on their upper side), and eight arms with suckers. (Squid and cuttlefish also have two tentacles.) Coleoids have skin that can **morph** into an amazing variety of colors, shapes, textures, and patterns. What's more, the change can occur in an instant!

An octopus with a funny name – wunderpus photogenicus – blends into the ocean floor.

Unlike other mollusks, coleoids are smart animals. Scientists who study octopuses think that most are about as smart as mice. One kind may be almost as brainy as a cat. The ability of coleoids to change how they look is not a **reflex**—they *choose* to do it!

Why Coleoids Use Camouflage

Can you spot the octopus?

Since coleoids don't have hard outer shells for protection, they are easy meals for **predators** to catch. Therefore, their first line of defense is camouflage, which keeps them safe from being spotted. Camouflage also allows them to hunt without being seen. They can lie in wait for **prey** to pass nearby and then attack the prey before it can escape.

Coleoids use many kinds of camouflage:

- *Looking like the background:* They may change the color and, in some cases, also the texture of their skin to blend in. They may also change the shape of their body, such as flattening their arms.

- *Looking like a certain object:* Some coleoids try to look like an object instead of their background. For example, a

giant Pacific octopus, normally orange, may look as if it's frosted with snow to hide among pure white **anemones**. One type of squid often swims **vertically** to blend in among seaweed.

- *Disruptive patterns:* Certain markings can make it harder for predators to see the outline of an animal. The markings disrupt, or interfere with, the shapes the predators are looking for. Cuttlefish use this kind of camouflage more than other coleoids.

- *Countershading:* Some coleoids are lighter on the underside of their bodies and darker on top. When seen from below, they may be harder to spot because of the sunlight nearer the ocean's **surface**. When seen from above, their dark form blends in better with the dark ocean depths.

When camouflage doesn't keep predators away, some coleoids try to **startle** the animal hunting them. Certain octopuses can surprise a predator by changing to bright white in the blink of an eye. This trick might buy the octopus a little extra time to escape.

Changing Color

Coleoids have four types of special **cells** under their skin that create their amazing color changes.

- *Chromatophores* (kro-MAT-uh-fores): These are groups of cells that include a stretchy pouch that holds a color—red, orange, yellow, brown, or black. Muscles attached to the pouch cause it to stretch or shrink. When the muscles get tighter, they stretch the pouch, causing the color to grow

larger. (Imagine a dot of ink on a rubber band getting larger when you stretch the rubber band.) When the muscles relax, the color pouch shrinks. Coleoids can stretch or shrink the colors at lightning speed. They can also stretch one and shrink one right next to it! Their amazing control over these pouches of color helps make coleoids camouflage wizards.

- *Iridophores* (ih-RID-uh-fores): These cells, which reflect light, are under the chromatophores. They create blues, greens, and golds that look shiny, like metal.

- *Leucophores* (LOO-koh-fores): These cells scatter and reflect light to produce white spots in some coleoids.

- *Photophores* (FOH-toh-fores): These cells produce light through chemicals in a coleoid's body.

Science Words

The word *chromatophores* comes from two word roots—*chromato,* meaning "color," and *phores,* meaning "a thing or part that has or carries." The root words below will help you understand where the other cell types got their names.

irido = "like the iris of the eye"

leuco = "white"

photo = "light"

Each of these four types of cells can create amazing camouflage by itself. But imagine all four working together. It's at least as awesome as the best special effects in movies!

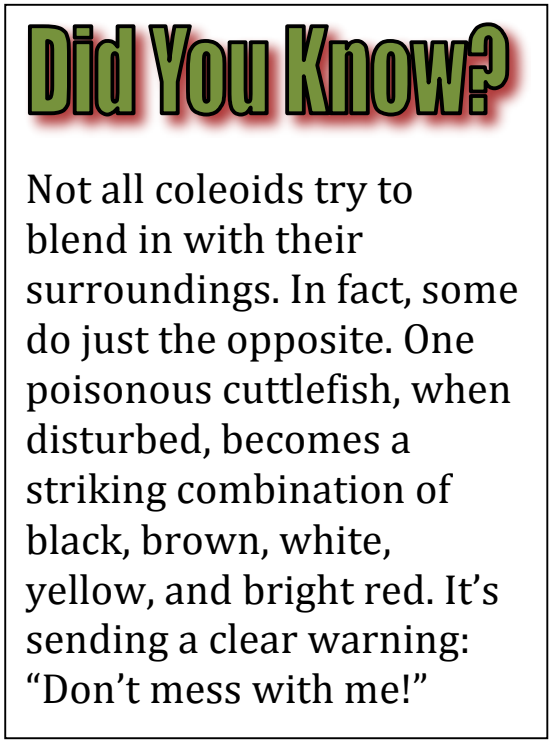
More Tricks

Coleoids also have other camouflage tricks. One is to change their outer texture using little fleshy structures in their skin. For example, some octopuses can make their skin rough when they're near a coral reef. But if they're on a sandy surface, their

skin becomes smooth. Both of these tricks help the octopus blend in with its surroundings.

One clever cuttlefish trick is to make a pair of eyespots appear on its back for a few seconds. The eyespots can confuse a predator, making it unsure of where the cuttlefish's head is or in which direction it is moving. Coleoids are also known for releasing a cloud of ink to blind a predator while they sneak away.

Octopuses, cuttlefish, and squid are so good at changing how they look that it's hard to put into words what they can do. The colors and textures, along with the speed of their changes, leave people speechless. Coleoids can also put on dazzling light shows to trick prey or attract mates.



Glossary

Anemones *(n)*	plantlike ocean animals whose tentacles look similar to flower petals.
Cells *(n)*	tiny building blocks of living things.
Creatures *(n)*	animals or other living things.
Morph *(v)*	to change from one thing to another.
Predators *(n)*	animals that survive by hunting and eating other animals.
Prey *(n)*	animals that are hunted and eaten by predators.
Reflex *(n)*	an action that is performed automatically and without thinking.
Startle *(v)*	to scare or surprise someone or something.
Surface *(n)*	the top or outside part or layer of something
Vertically *(adj.)*	in an up-and-down or upright position