Interactive Exploration of Coral Bleaching

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Interactive Video Glossary

This is a glossary of the scientific terms that appear in *Interactive Exploration of* Coral Bleaching.

Algae: A large group of eukaryotic organisms that perform photosynthesis and typically live in water. Some algae, such as dinoflagellates, are single-celled organisms. Other algae, such as kelp or seaweed, are multicellular.

Asexual reproduction: A form of reproduction that requires only one parent. It produces offspring that are genetically identical "clones" of their parent.

Autotroph: An organism that produces its own food from simple molecules (such as CO_2) using sunlight or chemical energy. Autotrophs are primary producers in ecosystems and include plants, algae, and some bacteria.

Biodiversity: The variety of species in an ecosystem. Ecosystems with higher biodiversity provide habitats for a variety of organisms and can produce more types of food and other resources than ecosystems with lower biodiversity can. They may also be better at handling environmental stress.

Bleaching: Coral bleaching is the process of coral polyps expelling the zooxanthellae that live in their cells. It is caused by stressful environmental conditions, such as heat stress, and causes corals to turn white or pale.

Budding: A type of asexual reproduction used by coral polyps.

Cellular respiration: A process that converts chemical energy stored in organic molecules to energy that can be used by cells.

Chloroplast: An organelle that performs photosynthesis.

Cilia: Short, hairlike appendages that coral larvae use to move.

Cnidarians: Invertebrates that typically live in aquatic environments. Their phylum, Cnidaria, contains corals, jellyfish, hydras, and sea anemones. Many cnidarians, including coral polyps, have stinging tentacles that they use to catch prey.

Colony: A coral colony is a group of coral polyps that live together. Together, they can build coral reefs.

Commensalism: A type of symbiosis that benefits one symbiont and neither harms nor benefits the other symbiont.

Degree heating weeks (DHW): An index used to measure the accumulation of heat stress, which can cause coral bleaching. It represents the intensity and duration of heat stress over the last 12 weeks.

Dinoflagellates: A group of single-celled algae that includes zooxanthellae.

Ecosystem: A community of organisms interacting with the environment in a particular area. An ecosystem includes both living components, such as plants and animals, and nonliving components, such as water or rocks.

Ecosystem services: Ways in which humans benefit from ecosystems. Some ecosystems provide services in the form of food, energy, building materials, and other resources. Ecosystems may also help clean the air and water, protect against erosion and natural disasters, and provide animals that pollinate crops.

Endocytosis: A process for transporting materials *into* cells. Larger particles, such as zooxanthellae, are transported using a type of endocytosis called phagocytosis. Smaller particles are transported using another type of endocytosis called pinocytosis.

Endosymbiont: An *endo*symbiont is a symbiont that lives inside the body or cells of its partner organism. Symbionts that live on the body surface of their partner organism are called *ecto*symbionts.

Epidermis: An outer layer of tissue in the coral polyp. It contains stinging cells called nematocysts in the tentacles.

Exocytosis: A process for transporting materials *out of* cells. Coral polyps can use exocytosis to expel zooxanthellae from their tissues.

Exoskeleton: *Exo*skeletons are hard tissues found *outside* the body. They are found in invertebrates like insects, crustaceans, snails, and clams. Other animals, including humans, have *endo*skeletons, which are found *inside* the body. Coral polyps secrete a cup-shaped exoskeleton below their bodies for protection and support. The exoskeleton is what gives coral reefs their hard structure.

Expel: To force out. During coral bleaching, corals expel zooxanthellae from their cells.

Fragmentation: One process by which corals can reproduce. Fragmentation happens when a piece of a colony breaks off as the result of a storm or being hit by an anchor, swimmer, or fish. The fragment reattaches to a surface and begins to grow as a separate colony. The polyps in both colonies are genetically identical.

Gastrodermis: An inner layer of tissue in the coral polyp. It contains zooxanthellae.

Gonads: An organ in the coral polyp that produces gametes (eggs and sperm) for sexual reproduction.

Heat stress: Stressful heat conditions that can cause coral bleaching. Can occur even when the sea surface temperature is just 1°C (2°F) warmer than usual.

Heterotroph: An organism that relies on other organisms for food. Coral polyps, for example, are heterotrophs that get some of their food from eating zooplankton. Heterotrophs are consumers in an ecosystem and include animals, some fungi, and some bacteria.

Host: A symbiont that harbors another (typically smaller) symbiont on, inside, or near its body.

Larva: A coral larva (plural: larvae) is the immature form of the coral animal. Coral larvae are tiny and move around. They often flow with ocean currents.

Metamorphosis: A biological process in which an immature animal (such as a coral larva) becomes a mature adult (such as a coral polyp).

Mitochondria: Organelles in which cellular respiration occurs.

Mutualism: A type of symbiosis that benefits both symbionts.

Organelle: A cellular structure that has a specific function in the cell. Examples of organelles include the nucleus, mitochondria, and chloroplasts.

Parasitism: A type of symbiosis that benefits one symbiont and harms the other symbiont.

Photosynthesis: A process that converts light energy from the sun to chemical energy stored in organic molecules. Photosynthesis consists of a series of chemical reactions that use energy from sunlight to produce "food" (in the form of carbohydrates) from carbon dioxide and water.

Photosystem: A protein-pigment complex that absorbs photons from sunlight for photosynthesis.

Pigment: In photosynthesis, a pigment is a colored biological substance that captures light energy. One common pigment, chlorophyll, is what makes many plants look green.

Polyp: A coral polyp is the mature, adult form of the coral animal. Polyps do not move and are typically attached to hard surfaces. They are typically only a few millimeters to a centimeter in diameter.

Reactive oxygen molecules: Oxygen-containing molecules, also known as reactive oxygen species (ROS), that react easily with other molecules. High levels of reactive oxygen molecules can damage a cell by reacting improperly with DNA, proteins, and other important cellular molecules.

Sexual reproduction: A form of reproduction that requires two parents. The parents contribute separate gametes (eggs and sperm) that contain different genetic material. Together, they produce offspring with new combinations of genetic material.

Symbiont: An organism in a symbiosis.

Symbiosis: A close, long-term relationship between two or more organisms (called symbionts) of different species. A symbiosis may help, harm, or not have significant effects on its symbionts.

Thylakoid: Membrane-lined discs embedded with photosystems. Stacks of thylakoids are found in chloroplasts.

Vacuole: A type of vesicle. It can be used for storing water, nutrients, or waste products. Large vacuoles may also provide structure and support for the cell.

Vesicle: A fluid-filled cellular structure similar to a sac. It can be used to store materials and transport them across the cell membrane.

Zooxanthellae: A type of dinoflagellate that shares a symbiosis with corals. Zooxanthellae (singular: zooxanthella) perform photosynthesis, which provides food for corals.