

# Understanding the Materials of the HelloReef® Aquarium

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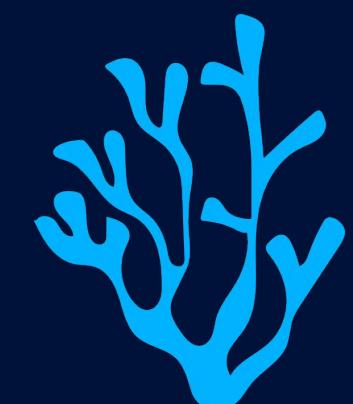
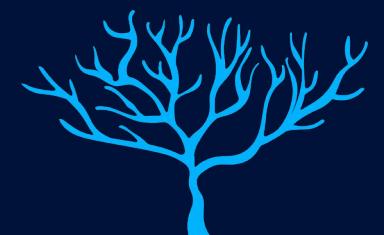
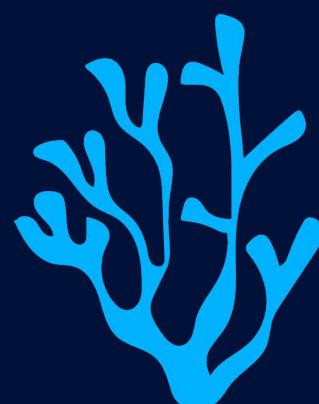
What are the essential materials used in the HelloReef® Aquarium, and how do they support a thriving marine environment?

## Do Now:

- Imagine you are setting up a saltwater aquarium. What materials do you think are necessary to create a stable environment for marine life?
  - List 3-5 items and explain why they might be needed.

# NGSS Standards

- HS-PS1-6 – Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.
- HS-LS1-5 – Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
- HS-ESS2-5 – Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.



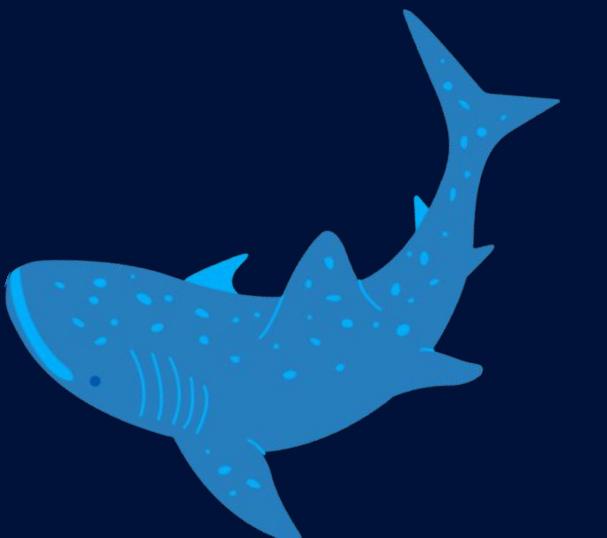
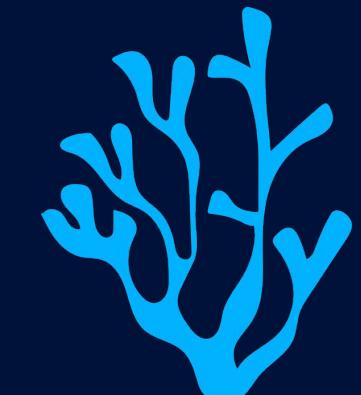
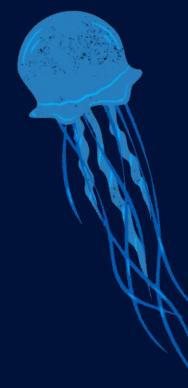
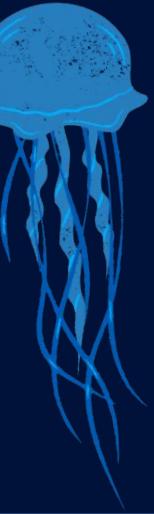
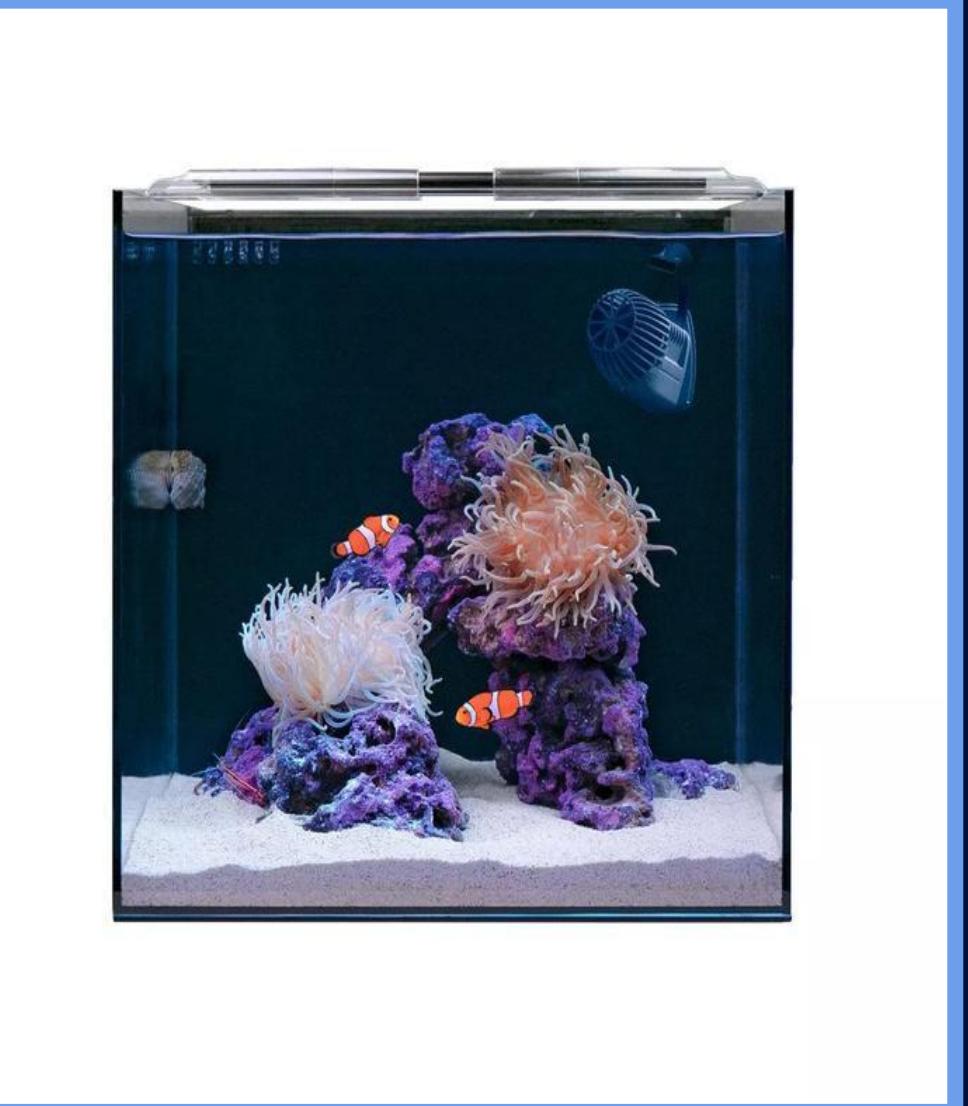
# Learning Objectives

- Identify and describe the essential components of the **HelloReef®** Aquarium.
- Explain the function of each material in maintaining a healthy reef system.
- Discuss the importance of water quality, circulation, and lighting for coral and fish health.
- Understand how the **HelloReef®** Aquarium replicates natural marine ecosystems.

# Essential Materials of the HelloReef® Aquarium

## Aquarium Tank Structure

- Typically made of glass or acrylic, designed to withstand water pressure and saltwater corrosion.
- Size considerations: Larger tanks offer more stable water conditions but require more maintenance.
- Benefits of a larger aquarium is that if something goes wrong, if caught early, more water volume can provide time to correct.



# Temperature Regulation

## Why is it important?

- Corals and marine fish require a stable temperature range (typically 76–82°F).
- Temperature fluctuations can cause stress, disease, and coral bleaching.
- Common Heater Features:
  - Adjustable thermostat to maintain precise temperatures.
  - Submersible design to evenly heat water.
  - The **HelloReef®** heater goes in the filter area.

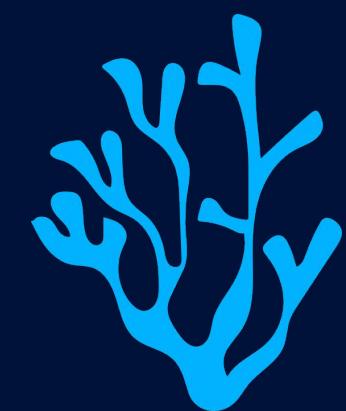


# LED Lighting: Providing Energy for Photosynthesis

- Coral species rely on zooxanthellae algae inside their tissues, which use photosynthesis to generate energy.
- Proper lighting enhances coral growth, color, and overall health.
- Common LED Light Features:
  - Full spectrum lighting to mimic natural sunlight.
  - Adjustable intensity to match different coral needs.
  - Day/night cycle programming for a more natural environment.

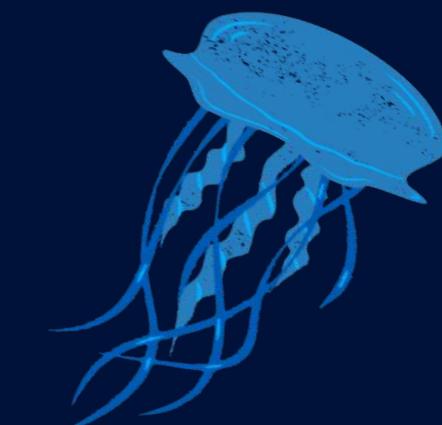
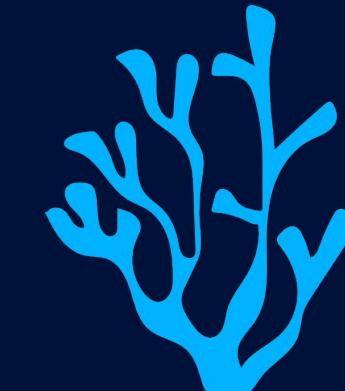
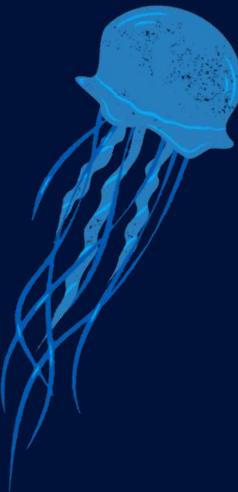


**LED Lighting**



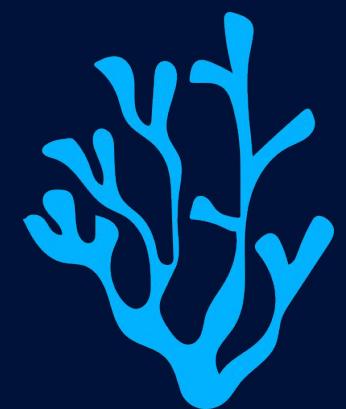
# Live Rock/Dry Rock: The Natural Filtration System

- Acts as a biological filter, housing beneficial bacteria that break down waste.
- Provides shelter and surfaces for corals, fish, and invertebrates.
- Types of Rock Used:
  - Live rock (from the ocean): Already colonized with beneficial bacteria.
  - Dry rock (man-made or aquacultured): Requires time to develop biological filtration.
  - **HelloReef®** Aquarium comes with dry rock.



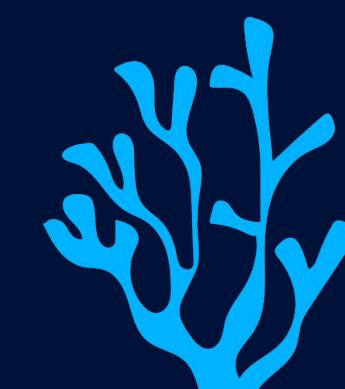
# Live Sand: Providing Water Stability

- Hosts nitrifying bacteria that help break down fish waste.
- Supports burrowing organisms like snails and gobies.
- Helps maintain pH balance in the water.
- Types of Sand:
  - Aragonite sand: Helps maintain alkalinity and calcium levels for corals.
  - Fine sand vs. coarse sand: Affects water clarity and flow.
- **HelloReef®** Aquarium provides Caribsea Live Sand



# Filtration: Keeping the Water Clean

- Removes waste, uneaten food, and harmful chemicals from the water.
- Houses mechanical, biological, and chemical filtration components.
- Activated carbon removes odors
- 225 micron filter sock removes particulates
- Filter sponges slow water flow to remove particulates
- Ceramic Biological media for biologic filtration  
(Nitrogenous waste removal)



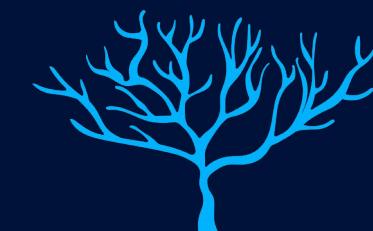
# It's All About Flow!

## Why is it important?

- Creates water circulation
- Prevents dead zones where waste accumulates.
- Delivers oxygen and nutrients to corals and beneficial bacteria.
- Mimics the natural wave action of the ocean.
- Common Features:
  - Adjustable flow rate to suit different reef environments.
  - Wave-making technology to create natural movement.



**Powerhead for flow**



# Putting an Ocean in the HelloReef® Aquarium

Can you just put tap water in your HelloReef® Aquarium?

- You shouldn't but you can just to start it.
- Think about investing in an RO/DI system as it removes chlorine and other unwanted chemicals.
- The HelloReef® Aquarium comes with 2 months of Aquaforest Reef Salt.
- Follow the instructions for mixing the salt into the water when you start your Aquarium.
- Use the HelloReef® Supply Seawater Refractometer to measure the salinity.



# What Else is in Salt?

The Aquaforest Reef Mineral salt blend represents what the ocean provides corals.

While the synthetic blend is mostly NaCl, it also includes Magnesium, Calcium, Potassium, Bromine, Fluorine, Barium, Iodine, and trace elements, all essential for coral health.



**Refractometer**



**measures salinity**