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## STANDARDS

- **CCSS:** RST.9-10.1, 2, 3, 4, 5, 7, 8, 9, 10; RST.11-12.1, 2, 3, 4, 7, 8, 9, 10; W.9-10.1, 2, 4, 7, 8, 9; W.11-12.1, 2, 4, 7, 8, 9; SL.9-10.1, 4, 6; SL.11-12.1, 4, 6
- **NGSS:** ESS 2.D, HS-LS4-4, HS-LS4-5, HS-LS2-6, HS-PS1-5, PS 1.B
- **OLP:** 2.B.7, 3.B.4, 5.B.1, 5.B.5, 5.C.23, 5.C.33, 5.C.34, 5.C.35

## ONLINE CONTENTS

- [Coral Growth Quiz](#)

# CORAL GROWTH

This lesson is a part of the *Coral Growth* unit, which explains how corals grow, and the shapes that they form. Below is a summary of what is included in the entire unit.

## UNIT CONTENTS

### A. [Background Information](#)

- How do Corals Grow?
- Growth Rates

### B. Lessons

#### [Candy Coral](#)

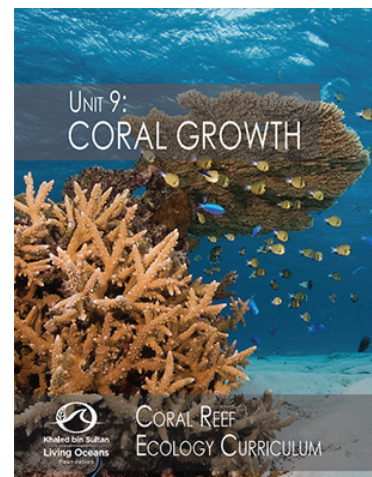
- A lab to simulate coral skeleton growth in different scenarios

#### [Which is the Superior Coral?](#)

- A debate over which coral growth form is the best

#### [Read it! Investigating the Reef Slope](#)

- A worksheet to accompany the [Investigating the Reef Slope](#) field blog



# LESSON 1

# CANDY CORAL

## PRE-LAB

**INSTRUCTIONS:** Answer the questions regarding coral growth below.

1. What is calcification?
2. What are the products of this chemical reaction?
3. Where does this reaction take place?
4. What are the substances corals need to begin the chemical reaction and where do corals get them?
5. In the table below are some main factors that affect growth rates. Explain how each factor is related to the growth rate of corals.

|                              |  |
|------------------------------|--|
| Temperature                  |  |
| Calcium carbonate saturation |  |
| pH                           |  |
| Current                      |  |
| Turbidity                    |  |
| Sedimentation                |  |
| Salinity                     |  |

6. Which environmental condition is your group going to be testing during the experiment? Predict how it will affect the growth of your candy coral.

**LAB**

**INSTRUCTIONS:** You will be using rock candy to simulate coral growth. Follow the procedures for your assigned group.

**Group:** \_\_\_\_\_

**DATA TABLE 1:** Candy Coral Growth

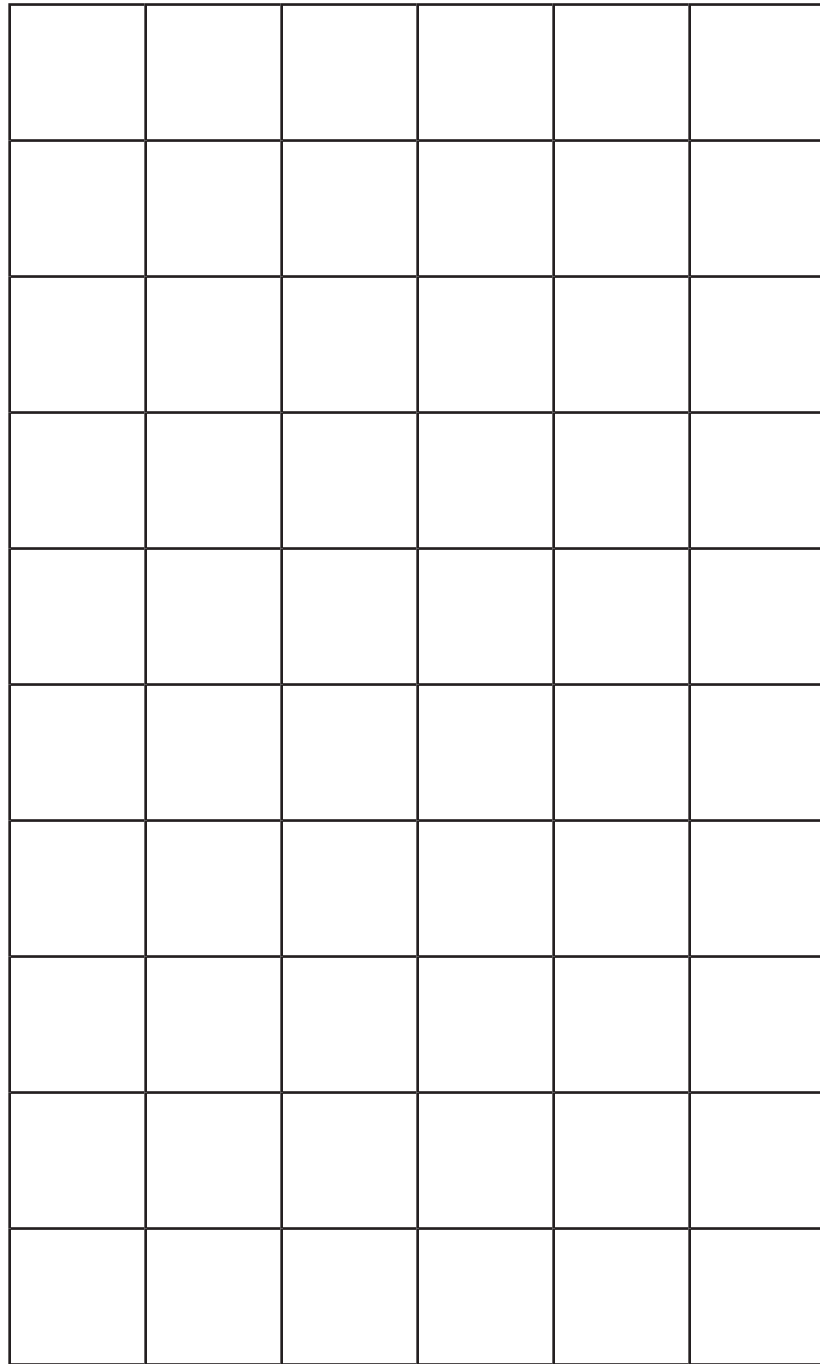
| Day # | Observations | Width (mm) |  |  |
|-------|--------------|------------|--|--|
|       |              |            |  |  |
|       |              |            |  |  |
|       |              |            |  |  |
|       |              |            |  |  |
|       |              |            |  |  |
|       |              | Average:   |  |  |

**FIGURE 1:** Draw your candy corals:



**DATA TABLE 2:** Effect of Environmental Conditions on Candy Coral Growth.

| Change in Environmental Condition | Width of Largest Crystal (mm) | Growth Form (sketch of each) |
|-----------------------------------|-------------------------------|------------------------------|
| A. None                           |                               |                              |
| B. Lower reactant saturation      |                               |                              |
| C. Acidic                         |                               |                              |
| D. Current                        |                               |                              |
| E. Turbidity/<br>Sedimentation    |                               |                              |
| F. Salinity                       |                               |                              |

**GRAPH 1:** \_\_\_\_\_

## POST-LAB

**INSTRUCTIONS:** Answer the discussion questions below.

1. During the lab, what compound “grew”?
2. How did the lab represent coral growth?
3. What reactants do corals need in order to grow their skeletons?
4. What happened to the candy coral growth when the saturation rate was decreased (Group B)?
5. If there were a decrease in the amount of calcium in seawater what would happen to growing corals? What would happen to the reef overall?
6. How did a more acidic pH (Group C) affect the candy coral growth?
7. If there were a decrease in the pH (increase in acidity) of the ocean, what would happen to growing corals? What would happen to the reef overall?
8. What happened to the candy coral that was exposed to increased current (Group D)?
9. If a coral settles in an area exposed to lots of current, what do you think would happen to it? What would happen to the reef overall?



10. How was the candy coral affected by flour in the solution, which simulated turbidity and sedimentation (Group E)?
11. If the ocean water were very turbid or exposed to a lot of sediment, what would happen to growing corals? What would happen to the reef overall?
12. What happened to the candy coral that was exposed to an increase in salinity (Group F)?
13. If a coral were exposed to a large change of salinity, what would happen to it? What would happen to the reef overall?
14. Why do you think corals are found in only 1% of the ocean?
15. Why is the health of corals threatened? Use data from this experiment to explain your answer.



16. What is the purpose of Group A? (Hint: Think scientific method.)

17. How can this experiment be made more valid?

18. What sources of error are in this experiment?

19. BRAINSTORM: Choose three factors from this lab that negatively affected the candy coral growth. For each factor chosen, describe possible ways to combat their effects on a coral reef ecosystem.