

Source: Corals and Coral Reefs: 4--8 Teacher's Guide. A Sea World Education Department Publication. Used with permission.

13. A CHANCE OF SUCCESS

Objective: Students will learn about the physical factors that limit where coral reefs develop.

Materials: 1 die, copy of score card

Action:

1. Lead students in a discussion about what things might limit where coral reefs develop. Ask them to name some of the conditions they know reef-building corals need to survive. (*Right water temperature; clear, shallow water; strong wave action to bring in nutrients*) Write these on the board. Explain to students that a site must meet all these criteria for a reef to successfully establish and thrive.
2. Show students the die and explain that they'll be playing a game in which they'll all be coral planulae in search of a settling site. Each student will roll the die three times, once for each survival factor.
3. Explain that to survive, they must roll one of these numbers when casting the die for that condition:

Temperature = 2,3,4,5 (1 too cold, 6 too hot)

Substrate/depth = 1,2,3,4 (5,6 too deep)

Wave action = 4,5,6 (1,2,3 too weak to bring in nutrients)

4. Place the score sheet on an overhead projector, or have a student keep score on the board.
5. Invite students up one at a time to roll the die. Be sure to state what factor they're rolling for each time. If they get a good number for all three rolls, they qualify for the next round.
6. Gather the qualifying "planulas" [planulae] in front of the class for the final round. Ask each student the following questions:
 - What are coral temperature requirements?
 - What are depth requirements?
 - Why do reef-building corals need strong wave action?

Those students that can answer the questions are the winning polyps.

7. Remind your students that corals release thousands of eggs and sperm, some of which join and develop into planulae. Do they think all the planulae survive? Why not? Explain that the reproductive process leans towards high numbers to allow for high mortality. Many planulae are eaten by marine animals before they settle and attach to the bottom. By producing hundreds of thousands of eggs at a time, a coral polyp increases the chance that one of its offspring will mature and reproduce, the measure of a species' survival success.

Deeper Depth: Calculate the percentage of planulae that survive each round.

NAME	WATER TEMPERATURE	WATER DEPTH	WAVE ACTION

Correlation to National Standards from McREL (<http://www.mcrel.org>) :

Life Sciences

6. Understands relationships among organisms and their physical environment

Geography

7. Knows the physical processes that shape patterns on Earth's surface