

Lesson 2.3

The Early Stages

Grades: 9-12

Integrated Subjects: Science, Mathematics, Biology, Reading

Essential Skills: Inferring, Problem Solving, Writing

Sunshine State Standards: SC.G.1.4.1, SC.F.2.4.3, SC.G.2.4.3, SC.F.1.4.7, SC.F.1.4.2, SC.F.2.4.1

National Science Education Standards: Meets Content Standards: 1) Life science; and
2) Unifying concepts and processes

Duration: 1 class period

Objectives:

Students will learn the importance of camouflage during the early stages of a conch's life, and they will understand how many ocean animals display various means to protect their young. Students will learn how to:

- ✦ Explain the form and functions conch use to survive
- ✦ Distinguish between r and k species

Preparation:

Teacher Preparation:

- ✦ Duplicate appropriate materials

Support materials:

- ✦ Lecture module with pictures/slides
- ✦ Egg masses slides
- ✦ Conch larvae pictures

Other materials:

- ✦ Map of the Caribbean

Information Sheets:

- ✦ No. 8 – Ocean Babies

Activity Sheets:

- ✦ No. 13 – Breeding Behavior
- ✦ No. 14 – Egg Math
- ✦ No. 15 – Hairy Beasts

Lesson Plan

Activity 1. Introduction (10 minutes)

Remind the students of the queen conch life cycle. Discuss how many animals go through various life stages for protection and survival.

Activity 2. (20 minutes)

Distribute and discuss Information Sheet No. 8. Have the students decide whether or not queen conch are *r*-selected or *k*-selected species. Why are so many reef/shallow ocean species *r*-selected? Have the students make a list of *r* and *k* selected species then compare their list to Activity Sheet No. 13.

Activity 3. Egg Math (20 minutes)

Have the students look back to their research on queen conch populations from Lesson 1.1, Activity 3. Pick a couple of countries (including your own) and record how many adults they collect each year. Use this number to represent the number of adult queen conch in that country at a time. Distribute Activity Sheet No. 14. Ask the students to answer the following questions:

- ✿ How many conch eggs are produced your chosen country each spawning season?
- ✿ Given the survival rate, how many of those eggs will become adults?
- ✿ If an adult conch can reproduce for 15 years, how many eggs can one female produce during her reproductive life?
- ✿ Why is it necessary for a conch to produce so many eggs?

Activity 4. It's a Hair Thing (10 minutes)

Queen conch larvae are born with cilia on their lobes to aid in locomotion and food collection. Have the students list other marine animals that use cilia at some stage in their life and compare to Activity Sheet No. 15.

Conclusion

Discuss how camouflage and broadcast spawning are two ways in which marine animals protect their offspring and help ensure their genetic survival. Be sure the students understand how cilia function for larvae, juvenile, and adult marine animals.

Bibliography

Colinvaux, P. 1993. Ecology 2. John Wiley and Sons, Inc. New York. 688 pp.

Davis, M. & A.L. Shawl. In press (a). A guide for culturing queen conch, Strombus
gigas. Manual of Fish Culture, American Fisheries Society, Vol. 3.