

Barnacles and Their Life Cycles -- GK12 Fellows Christina Geierman and Zair Burris

Goals:

- To review the major characteristics of crustaceans and why barnacles are a part of this group
- To show the diversity of barnacles
- To introduce barnacle adaptations
- To introduce the concepts of lifecycle and metamorphosis, using barnacles as an example
- To have students make detailed observations of live barnacles

Concepts:

- Crustaceans have jointed appendages, hard exoskeletons, segmented bodies, and molt.
- Lifecycle: how a baby animal changes to become an adult.
- Metamorphosis: when a baby animal does not look like its parent when it is born, its body changes as it grows up.
- Adaptation: a characteristic or behavior of an animal that helps it to live in its habitat.
- Adult barnacles feed with their legs, cement themselves to rocks head first, live their adult life in the same spot, eat plankton, have a “door” that can be closed at low tide to keep predators out and water in.
- Baby barnacles, larvae, are very different from the adults.

Lesson Plan:

1. This lesson is best after a lesson on crustaceans. Start by reviewing the characteristics of crustaceans (jointed arms and legs, hard exoskeleton, molt, segmented bodies) and show a video clip of a barnacle feeding. Ask the class if they think it is a crustacean (most

will say no). Explain why it is a crustacean, and that it uses its jointed legs to catch food.

2. Next show the Barnacle PowerPoint, and have the students guess barnacle adaptations for protecting themselves, for not drying out at low tides (plates make a shell that can be closed), and for feeding. Discuss where they can be found (docks, rocks, hard surfaces, whales, manatees, and some make their own floats). Talk about what eats them (snails can drill through their plates, sea stars and crabs can open up their “door”, birds).
3. Have students close their eyes and imagine they are a baby barnacle. Read the guided imagery and have the students act it out.
4. Introduce the concepts of lifecycle and metamorphosis by asking what a frog and/or butterfly looks like as a baby and how it changes to become an adult. With the poster of the barnacle lifecycle, and referring back to the guided imagery, point out the characteristics of each stage: nauplius (one red eye, two long “arms” with hairs at the tips), cyprid (two red eyes, no mouth but a cement sac, body covered by a “helmet”), cyprid attaching its head, adult (grow thick plates, with a hole in the top that has two doors that “legs” kick out of to eat)
5. Pass out the first page of the barnacle lifecycle worksheet and have students color like a scientist (using only colors that they see on the animals). They can draw legs on the adult. Have them cut out the pictures and put them in order from youngest to oldest. Then pass out the second sheet and have them glue on the pictures in the correct order.
6. Have students rotate through several stations with live examples of different kinds of barnacles.

Assessment: Barnacle lifecycle worksheet and observations of live animals

Materials:

- video clip of barnacles feeding, <http://www.youtube.com/watch?v=m2LIEPVhILQ&feature=related>
- barnacle PowerPoint

- guided imagery sheet
- barnacle life-cycle poster (hand drawn from worksheet, optional but recommended)
- Barnacle lifecycle worksheet
- live barnacles (optional): goose-neck and/or acorn barnacles

Reflection:

This is a great lesson, with or without the live animals. Turning the PowerPoint into a game to find adaptations that help barnacles live keeps students excited and wanting to learn. The barnacle guided imagery is a great way to introduce the lifecycle of a barnacle, and by letting the students act out each part you can refer to it later when they are doing the worksheet. Most students were able to complete the worksheet correctly without help. Any students that had trouble understood once you told them to think back to acting out a baby barnacle. They remembered only having one eye in the middle of their forehead, and two long arms; and then later looking like a helmet, and attaching head first. It is fun to have students “cement” themselves head first to their desks and eat with their feet!

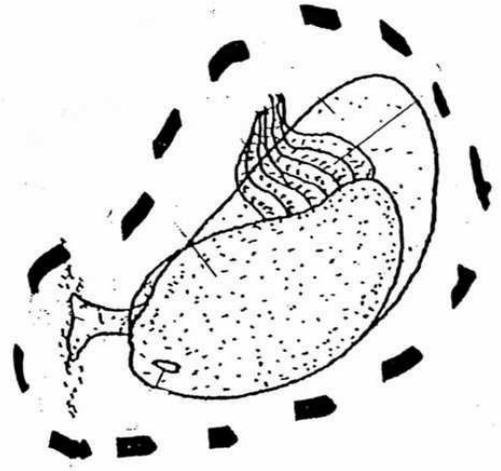
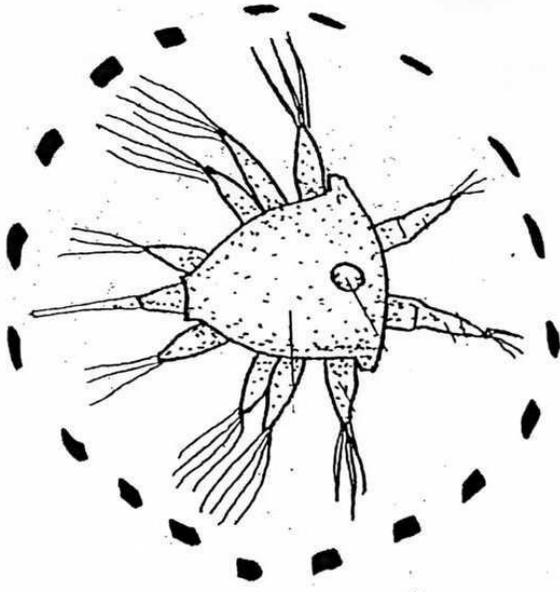
Barnacle Guided Imagery by Christina Geierman

You are a baby barnacle still in the egg. You slumber safe inside the shell of your mother. Curled up tight in your eggcase, you rest with hundreds of brothers and sisters packed close to you. Finally, the day comes to hatch. You struggle out of your eggcase and swim up and out of your mother's shell into the water. Instead of skin, your body is covered by a thin shell. You have two arms with long hairs at the tips instead of fingers. You have one red eye right in the middle of your forehead.

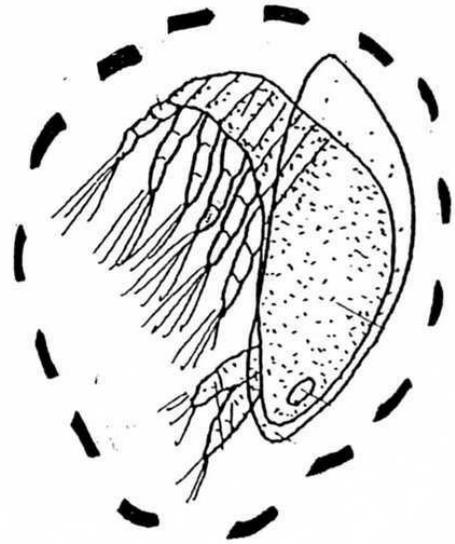
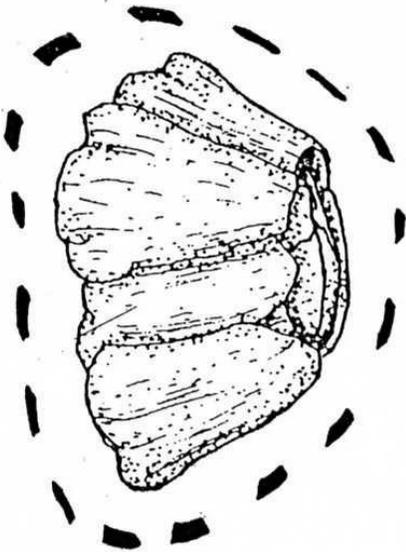
You swim up towards the light. Your brothers and sisters are swimming up with you. Soon, you find yourself in the warm, sunlit waters at the surface of the ocean. You have become part of the plankton- a group of very, very small plants and animals. You feel hungry. You see some tiny green plants called algae and start to eat. You keep eating and growing. Soon, you are too big for your shell, so you grow a new shell under your old shell. Your old shell splits along the back and you swim out.

After a week of eating and growing bigger, you feel your body start to change. You shed your shell again, but your new shell does not look like your old one. You have two eyes now, instead of just one. Your body is flat like a football. Your mouth is gone, and in its place you have a sack of cement. You kick your legs and swim back down to the bottom of the ocean. You find a rock and search for a good place to call home. After looking for a while, you find a nice spot on the rock near some adult barnacles. You open your sack of cement and stick yourself head-first onto the rock.

Once again, your body changes. You make thick plates around your body. Now you look like a tiny volcano. You have a hole in the top of your shell with doors. You can open the doors and kick your legs out of your shell. Your legs are very hairy. Bits of food stick to your feet and you lick them off. One day, you too will lay eggs and keep them safe inside your shell. Then the cycle will begin again.

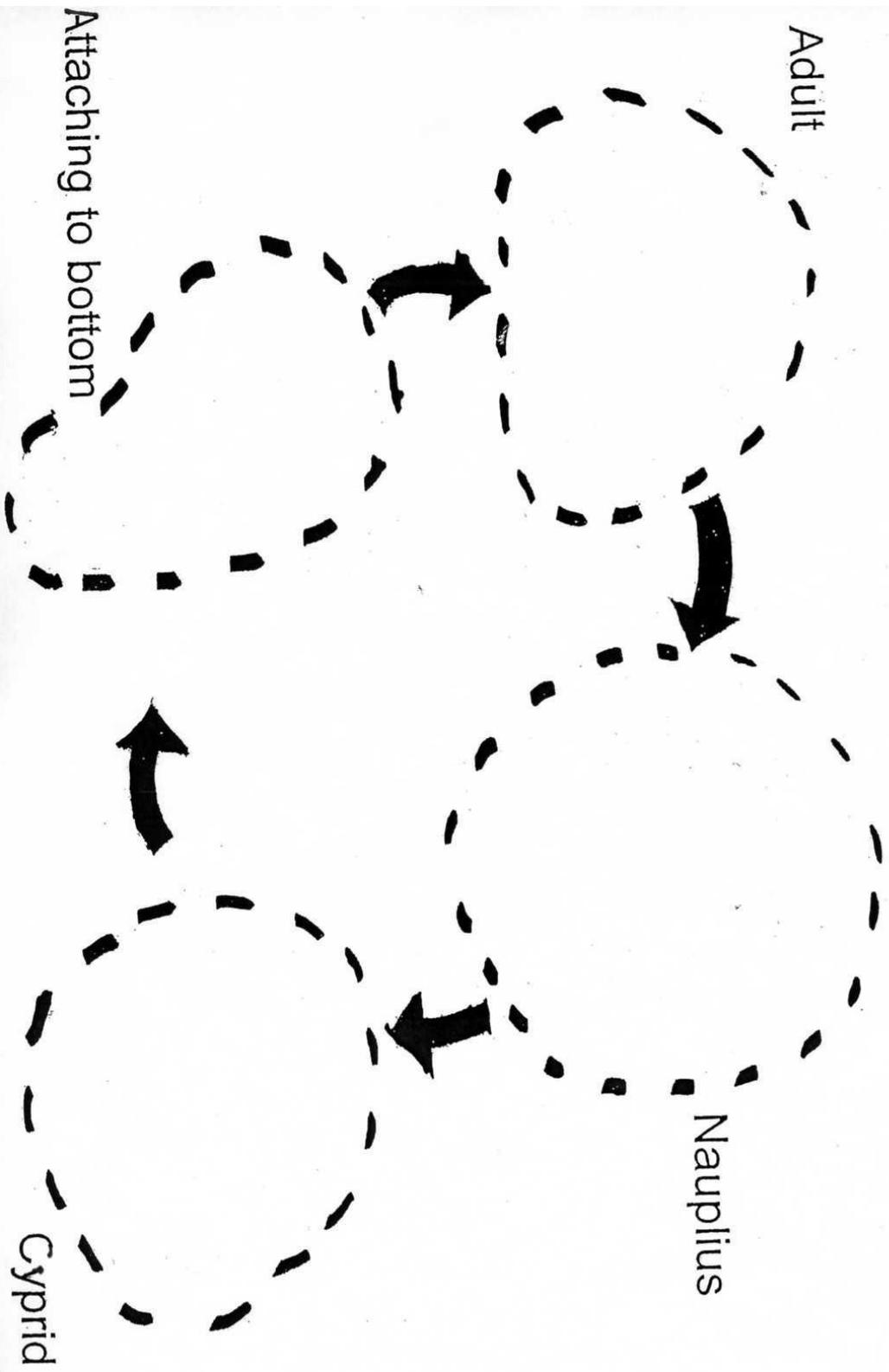


Picture Source:
Niesen, Thomas M. (2000). The Marine Biology Coloring Book. New York,
HarperCollins.



Junior Scientist: _____

Life Cycle of a Barnacle



Worksheet for Fellow Lesson

Junior Scientist: KEY

Life Cycle of a Barnacle

