

**Tide Pool Survival**

Name:

Period:

ATTACHED\*  
 CORALLINE ALGAE<sub>(a)</sub>  
 ENCRUSTING<sub>a<sup>1</sup></sub>  
 ARTICULATED<sub>a<sup>2</sup></sub>  
 SURF GRASS<sub>b</sub>  
 RED ALGAE<sub>c</sub>  
 SPONGE<sub>d</sub>  
 SOLITARY CORAL<sub>e</sub>  
 GIANT GREEN  
 SEA ANEMONE<sub>f</sub>

MOTILE\*  
 TIDEPOOL SCULPIN<sub>g</sub>  
 BROKEN-BACK SHRIMP<sub>h</sub>  
 HERMIT CRAB;  
 DUNCE CAP LIMPET;  
 SEA STAR<sub>k</sub>  
 BRITTLE STAR<sub>l</sub>  
 POLYCHAETE WORM<sub>m</sub>  
 ROCK CRAB<sub>n</sub>

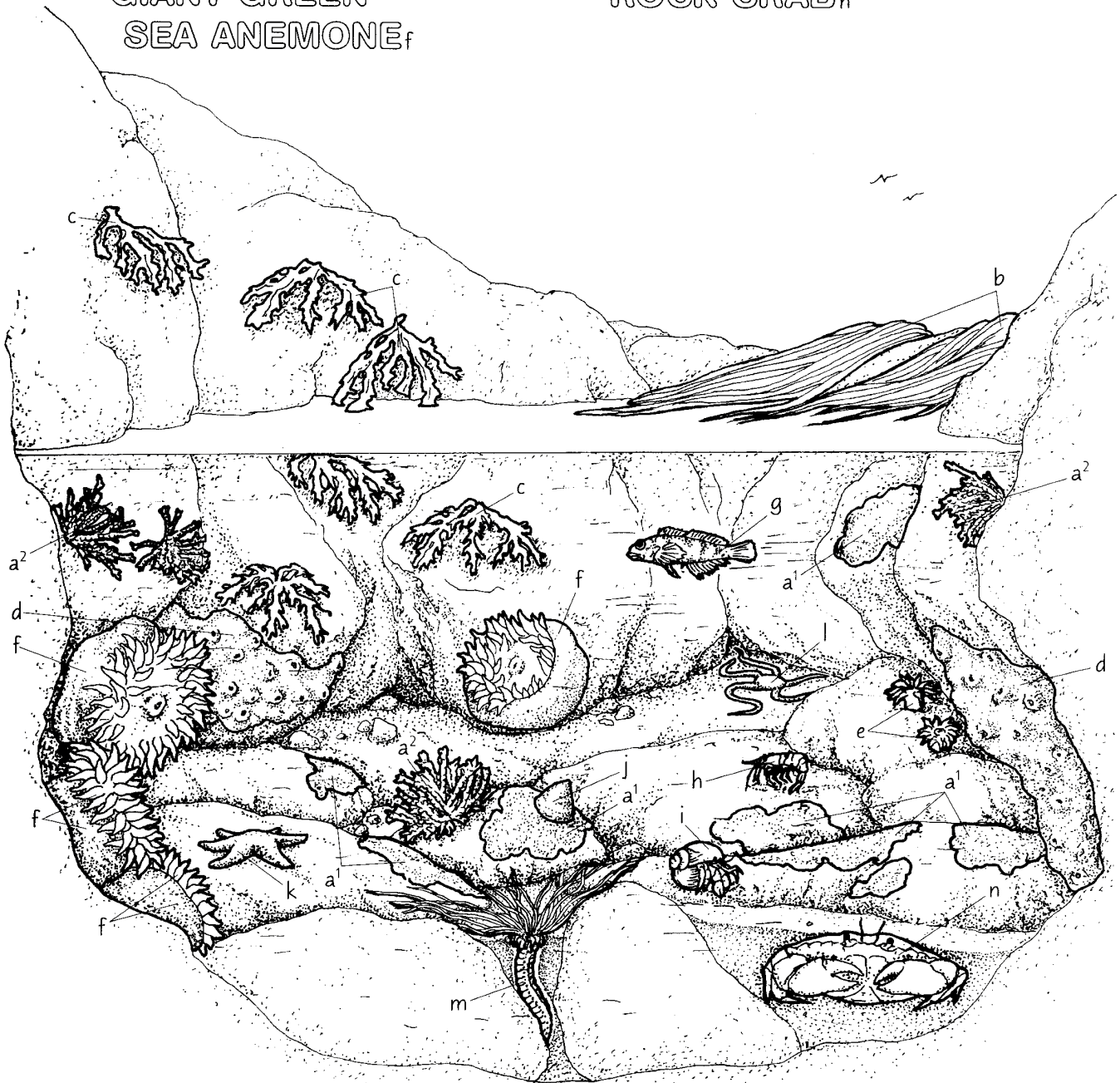


diagram from The Marine Biology Coloring Book (2000) by Thomas M. Niesen

Work: 13 points

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Follow the directions below to color-code the diagram and to answer the questions. You can use p.310 of your textbook to help you. Use colored pencils, and check off each box  as you finish that part of the instructions.

For this exercise, you will be analyzing how an organism's traits help it to survive in a particular environment. If it has the right adaptations, and survives long enough to reproduce, those handy survival traits will get passed on to its offspring. This whole process is referred to as natural selection.

Take a look at the diagram. It shows a tide pool along the central coast of California. A tide pool is a place in rocks along a beach that still holds water when the tide goes out. Animals and plants here need to be able to survive both in calm water (when the tide is out) or moving water (when the pool is covered again). If pools begin to lose water, the animals and plants need some way to keep from drying out. If predators come by while the pool is exposed, the animals must have some way to hide quickly and not be seen.

1. There are two types of organisms in the tide pool, those that are attached to the rocks, and those that can move around. Use black to carefully color in the letters of the words ATTACHED  and MOTILE  (a fancy word for things that can move).

2. Attached firmly to the rocks in places where they can receive sunlight are different types of algae and grasses. Color the different types of coralline algae (a, a1, a2) and their labels pink  . Color the surf grass (b) light green  , and the red algae (c) red  . Color their labels the same way  .

Why doesn't the algae and grass float away when the tide comes in?

What would happen if some algae had genes that gave it a weakened grip on the rocks?

3. There are also animals that spend their lives attached to the rocks of the tide pool. Color the sponge (d) yellow  , the solitary coral (e) orange  , and the giant green sea anemone (f) green  [duh!] . Color their labels the same way  .

If these animals are attached to the rocks and can't chase their prey, how do they eat? Hint: think about how the sea anemone catches its food; all of these animals eat the same way.

4. Now let's think about the animals that can move around. The sculpin (g) darts around the pool really quickly, and then drops to the bottom of the pool to be camouflaged against the bottom. Both of these things help it to escape predators. Presume that the rocks in this tide pool are gray in color. Color the sculpin  and its label  a color that will help the fish hide.

What color did you use for the sculpin? \_\_\_\_\_ Why did you choose this color?

5. Find the broken-back shrimp (h) in the diagram. Like the sculpin, it moves around quickly (bending itself in half to zip away, thus its name), and is camouflaged against things found in the tide pool. The shrimp use several colors for camouflage. Color this shrimp  and its label  gray and light green.

Based upon the coloring of the shrimp, where could you look for it in the tide pool besides on the rocks?  
\_\_\_\_\_. Why would it be an advantage to survival if an animal can hide in more than one spot?

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6. The hermit crab (i) is able to survive by carrying armor around with it. It finds shells that will fit its body, backs into them, and hauls the shell around as it searches the tide pool for things to eat. Color the hermit crab body (not the shell!) purple □, along with its label □. Color the shell □ and its label □ a color that will help the hermit crab hide in the tide pool.

What shell colors would increase the chances of the hermit crab surviving?

What shell colors would decrease the chances of the hermit crab surviving?

7. The dunce cap limpet (j) is an animal similar to a snail. It moves very slowly around the tide pool, feeding on something that no other animal eats; it has no competition for food. Because it moves so slowly, some of its food actually has time to grow on the shell of the limpet. Color the limpet □ and its label □ pink.

Based upon the color of the limpet shell, what does the limpet eat? Hint: look back through your key.

8. The sea star (k) is not a picky eater. It roams all over the tide pool, eating pretty much anything its arms can put into its mouth. Color the sea star □ and its label □ dark green.

How do the eating habits of the sea star help it to survive? Hint: does it have to compete for a particular kind of food?

9. Some of the animals in the tide pool prefer to live in any sand that gets washed in to spaces between rocks on the bottom. They are able to burrow into the sand to hide, either from predators or prey. Color the brittle star (l) □ and its label □ orange. Color the polychaete worm (m) □ and its label □ yellow. Last, color the rock crab (n) □ and its label □ red-brown.

Both the brittle star and the polychaete worm have rather fragile bodies. How does living in the sand help them to survive?

How does hiding in the sand help the rock crab to both be a predator, and to keep from becoming prey?