

## Sand Dollars

When walking on a sandy beach you may find bleached white, flattened disks called sand dollars probably so named because they look like big coins and feel like pressed sand. You are fortunate when you find one that is intact because sea gulls often peck at their middle looking for small amounts of food. Sea gulls find them, just like we do, when sand dollars are washed up on the beach or in shallow water at low tide. The skeletal remains of sand dollars are called tests, not shells. You may find tests of tiny sand dollars or larger ones up to 3-4" in diameter. Sand dollars are found on both the Pacific and Atlantic coasts and throughout the world in sandy or muddy seafloor bottoms. They live in shallow inter tidal waters and also in deeper parts of the ocean up to 130 feet.

Common sand dollars are shaped like flat disks with flower like patterns of five petals on their topside called the aboral side. These five petals are actually double rows of tube feet not used for locomotion but for respiration or breathing. There are lots of variations on this basic design.

Unlike common sand dollars whose surfaces are marked only with flowerlike patterns, some sand dollars have elongated slots on their aboral surface or notches on the edges. Keyhole Sand Dollars, (also called Keyhole Sea Urchins), have five elongated slots or holes called lunules with one tall, thin one that resembles a keyhole. Arrowhead Sand Dollars have five large notches spaced around their edges with one large lunule at the bottom. The bottom of the sand dollar has a straight edge breaking the oval shape.

Some sand dollars have raised, puffy aboral surfaces and are called colorful names such as Sea Biscuits, Sea Cakes, and even Sea Gophers. Some are more oval than round.

All sand dollars have five distinctive parts radiating from the center like spokes from a wheel. Echinoderms, marine invertebrates displaying this unique five-part radial symmetry, also have tube feet and calcium like plates called ossicles. Echinoderms include sea stars, sea urchins and sand dollars. Unlike sea stars, sand dollars and sea urchins are completely covered with these tightly packed

## Sand Dollars (Cont'd)

skeletal plates and are further grouped together as Echinoids. Echinoids also have spines.

Common sand dollars move using abundant short spines that cover them. Unlike their bleached tests found on the beach, living sand dollars are covered with short, purple spines and cilia, or short hair-like threads that make living sand dollars feel fuzzy to the touch. Unlike sea stars that use tube feet to move, sand dollars march across the sand coordinating these spines. These spines also allow common sand dollars to burrow in the sand when alarmed by predators such as sea stars, fish, and skates. On the Pacific Coast of the United States, the giant pink star has been known to plow through a colony of sand dollars looking for dinner. Sand dollars are always found living in large groups.

Common sand dollars of the Pacific Coast use their spines to wedge themselves at an angle in the sand to catch food. Some sand dollars on the East Coast burrow just beneath the surface of the sand. Sea Biscuits in Florida and the West Indies don't burrow themselves at all, but rest on top of the sand in deeper water.

Sand dollars feed on minute plant and animal materials. Their mouths are located on the suboral or bottom side in the center. The spines, cilia, and tube feet all contribute to getting food to their mouths. They have a jaw that contains five teeth that grind the materials into smaller pieces. Sometimes these five teeth can be heard jumbling about in empty tests or seen when sand dollar tests are broken.

Sand dollars are very slow to ingest their food – sometimes taking as long as forty-five minutes. They also take in lots of sand when they eat. It is believed by some researchers that juvenile sand dollars ingest large bits of sand to weight themselves to the bottom.

Flat or raised, sand dollar tests found at the beach are beautiful in their various shapes and patterns. Living sand dollars are even more interesting when seen walking on the sand or large numbers wedged in the sand looking for food.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Sand Dollars Questions

Use a dictionary and the article to define the following words:

tests

aboral

oral

lunules

ossicles

phylum

echinoderms

echinoids

cilia

respiration

Name \_\_\_\_\_

Date \_\_\_\_\_

### **Sand Dollars Questions (Cont'd)**

Answer the following questions in complete sentences.

1. Where do sand dollars live?
2. What do common sand dollar tests look like?
3. What do common living sand dollars look like?
4. How do sand dollars move in the sand?
5. How do sand dollars eat?
6. Who eats sand dollars?
7. Describe (or draw and label) either an Arrowhead Sand Dollar or a Keyhole Sand Dollar.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Sand Dollars Answers

tests – skeletal remains or “shells” of sand dollars

aboral – top side of sand dollars

oral – bottom side of sand dollars

lunules – slots (hole) in sand dollars

ossicles – bony plates that comprise the skeletons of echinoderms

phylum – a group of animals

echinoderms – marine invertebrates having radial symmetry, tube feet, and calcium plates

echinoids – echinoderms having tightly packed ossicles and spines

cilia – tiny, hair-like threads that aid in movement

respiration – breathing in and out

### Sand Dollars Answers (Cont'd)

1. Sand dollars live on sandy sea bottoms either close to the shore or covered completely in deeper water.
2. Common sand dollar tests are bleached white and look like flattened disks and feel like pressed sand.
3. Common living sand dollars have abundant short, purple spines covered with cilia and feel fuzzy.
4. Sand dollars use their short spines to move along, burrow, or wedge themselves in the sand.
5. Sand dollars move food to their mouths located in the middle of the oral side using their spines, cilia, and tube feet.
6. Skates, some sea stars, some fish, and sea gulls eat them.
7. Arrowhead Sand Dollars have five large notches spaced around their edges with one large lunule at the bottom. The bottom of the sand dollar has a straight edge breaking the oval shape.

Keyhole Sand Dollars have five elongated slots or holes called lunules with one tall, thin one that resembles a keyhole.