

Sponges

By Cindy Grigg

¹ Sponges are the simplest multicellular animals. They lack true tissues. They have no muscles, nerves, or internal organs.

² Sponges live all over the world. Most of them live in oceans, but some can be found in freshwater lakes and rivers. Sponges are attached to hard surfaces underwater. They are well-adapted to their watery life. Moving water currents carry food and oxygen to them and take away the sponges' waste products.

³ Sponges don't look or act like most animals. In fact, they are so different that people used to think they were plants. Like plants, adult sponges stay in one place. But unlike plants, sponges must take food into their bodies to live. They can not make their own food like plants do. This puts them into the same kingdom as animals. These strange animals have been on Earth for about 540 million years.

⁴ The bodies of most sponges have irregular shapes. Most of them have no symmetry. Although some of their cells do specialized jobs, sponges lack tissues and organs. Hundreds of pores, many of them too small to be seen by the unaided eye, dot the surface of a sponge's body. In fact, the name of the group to which sponges belong-phylum Porifera-means "having pores."

⁵ Because moving water carries food and removes wastes, it is the key to the sponge's survival. Water enters the small pores throughout the sponge's body. Then it flows into a central cavity. Water leaves the sponge through the osculum, a large opening. The water carries wastes away from the sponge. After reproduction, water also carries the microscopic young sponges away from the parent sponge.

⁶ The layer that lines the central cavity is made of collar cells. Collar cells have whiplike structures that beat back and forth to move water through the sponge. Collar cells also strain food from the water. The collar cells act as the sponge's digestive system.

⁷ The soft bodies of most sponges are supported by a network of spikes. Those spikes can be as sharp as needles. The spikes form a rigid frame that helps support the sponge's body. Blobs of living jelly cells are found among the spikes. These jellylike cells digest and distribute food, carry away wastes, and form sperm or egg cells.

⁸ Sponges feed by straining food particles from water. As water enters a sponge,



it carries tiny organisms such as bacteria and protists. Collar cells on the inside of the central cavity trap these food particles and digest them. Sponges are very efficient at removing food particles from water. A sponge the size of a teacup is able to remove food from 5,000 liters of water each day. That's enough water to fill a truckload of two-liter soft drink bottles!

⁹ A sponge gets its oxygen from water too. The water contains oxygen, which moves from the water into the sponge's cells in a process known as diffusion. In diffusion, molecules of a substance move from an area in which they are highly concentrated to an area in which they are less concentrated. Oxygen is more highly concentrated in the water than it is in the sponge's cells. So the oxygen moves from the water into the sponge. Diffusion also carries waste products from the sponge's cells into the water.

¹⁰ Sponges reproduce both sexually and asexually. Budding is one form of asexual reproduction in sponges. In budding, small new sponges grow from the sides of an adult sponge. Eventually these tiny sponges detach and begin life on their own. Sponges reproduce sexually, too. Sponges do not have separate sexes—a single sponge forms eggs at one time of the year and sperm at a different time. At any one time of the year, some sponges are producing eggs and others are producing sperm. When a sponge produces sperm, the water currents that move through the sponge carry sperm from the sponge into the open water. The sperm may then enter the pores of another sponge and fertilize egg cells in that sponge. This sexual reproduction produces offspring that is different from either parent but is a mixture of the genes of both parents.

¹¹ After fertilization, a larva develops. A larva (plural larvae) is the immature form of an animal that looks very different from the adult. A sponge larva is a hollow ball of cells that swims through the water. Eventually the larva attaches to a surface and develops into a nonmoving adult sponge.

¹² Sponges don't look or act like most animals you know. But sponges are animals because they must take in food, and they are multicellular. All animals need food, water, and oxygen to survive. Sponges get food by straining the water that comes through their pores. Oxygen is also obtained from the water the sponge lives in. These strange animals have lived on the Earth for a very long time.

Name _____

Science Pd: _____

Sponges

<p>1. Sponges are called the simplest animals because they:</p> <ul style="list-style-type: none"><input type="radio"/> A Have no nerves<input type="radio"/> B Have no muscles<input type="radio"/> C Have no internal organs, including a brain<input type="radio"/> D All of the above<input type="radio"/> E None of the above	<p>2. Sponges can only live in water.</p> <ul style="list-style-type: none"><input type="radio"/> A False<input type="radio"/> B True
<p>3. What are the cells that act as the sponge's digestive system?</p> <ul style="list-style-type: none"><input type="radio"/> A Digestive cells<input type="radio"/> B Collar cells<input type="radio"/> C Pores<input type="radio"/> D Osculum	<p>4. To which phylum do sponges belong?</p> <ul style="list-style-type: none"><input type="radio"/> A Porifera<input type="radio"/> B Protista<input type="radio"/> C Osculum<input type="radio"/> D Animalia
<p>5. By which process do sponges get oxygen from the water?</p> <ul style="list-style-type: none"><input type="radio"/> A Diffusion<input type="radio"/> B Budding<input type="radio"/> C Osmosis	<p>6. Sponges reproduce:</p> <ul style="list-style-type: none"><input type="radio"/> A Sexually<input type="radio"/> B Asexually<input type="radio"/> C Both a and b<input type="radio"/> D None of the above
<p>7. Sexual reproduction produces offspring that are:</p> <ul style="list-style-type: none"><input type="radio"/> A Identical to the female parent<input type="radio"/> B A mixture of the genes of both parents<input type="radio"/> C Identical to the male parent<input type="radio"/> D Clones of the parents	<p>8. Young sponges move through the water, but adult sponges don't.</p> <ul style="list-style-type: none"><input type="radio"/> A False<input type="radio"/> B True