# Peer Instruction Answer Key: Porifera (Sponges)

1. How do sponges ingest and digest their food?
   1. Sponges are suspension/filter feeders meaning they collect food particles from water with food trapping equipment.
   2. **To trap food** sponges are able to sweep water through their body with the whip-like flagella at the end of the choanocyte cells. As the water (with bits of food) is drawn in through the outer pores of the sponge it rushes toward the central opening. Just before the water exits the central opening there are cells called choanocytes. These cells look like this

The cone shaped part is covered with mucus that is sticky. As the water (with bits of food) rushes by the mucus “collar” of the choanocyte the food sticks to the mucus and the water keeps moving. The food is then engulfed and put into a little food package. Another type of cell called an amoebocyte picks up the food and digests it. Amoebocytes can move around. This makes sense as they have to pick up the food from the choanocyte. Once they pick up the food, they can break it down into small pieces and digest it (think of this like our stomach with the chemical digestion). Now the nutritious remains of the food are carried around by the amoebocytes to the other cells in the sponge.

* 1. A lot of water has to move through the sponge for it to collect a small amount of food. A measuring cup holds 8 ounces of liquid. You know how large a gallon of milk is. With those two things in mind: A sponge gets about 3 ounces of food for every 275 gallons of sea water it filters!

1. What is sessile? What adaptations do sponges have to protect them in their sessile lifestyle?
   1. Sessile means anchored in place (that’s why the Greeks thought they were plants)
   2. Adult sponges are sessile and therefore they cannot escape from predators
   3. Sponges make defensive compounds like toxins and antibiotics
   4. Toxins are poisons/venoms
   5. Antibiotics are often used in human medicine to target bacteria and microorganisms. This helps sponges destroy microorganisms that could otherwise attack them.
   6. The toxins and antibiotics protect sponges from pathogens, predators, and parasites
   7. Pathogens are any microorganisms that could cause the sponge disease
   8. Predators are anything that may be interested in eating the sponge such as fish, turtles, and some sea slugs
   9. Parasites are any organism that lives in or on the sponge
   10. Sponges also have spicules which are sharp and uncomfortable to eat (deters predators)
2. Why are sponges considered alive? Address simplicity in your answer.
   1. Made of cells: Choanocytes/Amoebocytes. They have two layers of separated by a gelatinous region
   2. Obtain and Use Energy: Filter feeding uses energy and captures food which is then used for energy
   3. Grow and Develop: There are different size sponges (larval stage isn’t sessile)
   4. Reproduce (We will watch a video on this)
   5. Respond to their surroundings: Produce Toxins and Antibiotics