



## Meet At the Function Junction

### Find What You Need..

- A group of kids
- Paper and pencil
- A hat to put slips of paper into
- An outdoor spot to explore

**We recommend  
that an adult  
help lead this activity**



**Paper and pencil**



**A hat to put slips of  
paper into**



**An outdoor spot to explore**

### What do a water pump and a squid have in common?

Pumps are designed to move water, and so are squids. Squids move forward by shooting out jets of water behind them. Moving water is the function of a water pump, and it's one of the functions of a squid's body.

The same function can be accomplished in very different ways. For example, cell phones, computers, and pencils all perform a function: they help people communicate. Crickets' legs have several functions: they help the cricket jump, and they also make noise that communicates with other crickets.

What other functions can you think of? For example: What function do a sponge and a cat's tongue have in common? Glue, scotch tape and gecko toes can all perform the same

function – what is it? In this activity, you'll think up a lot of functions, then you'll take turns finding natural objects that can do the job.

### **Fact:**

**Squids move using *jet propulsion* - creating a backwards force to move forward. Rockets, and airplanes with jet engines, move in the same way.**

## Activity Instructions

1. Work together to see how many functions you can think of. Write each function on a separate piece of paper and put all the papers into a hat. See the Function Examples below.
2. Find an outdoor spot where you can safely explore natural objects.
3. Take turns choosing a function from the hat. Look for – or just think of – a natural object that can do that job.
4. Share your findings with your class, describing how the natural object accomplishes the function.
5. Working together, see if you can think of more than one natural object for each function.

## Brain Buster:

Can you think of some things in nature that perform a function well, and that have given scientists ideas for new inventions? For example, what popular invention was inspired by a prickly seed burr that could stick very well to clothes?

Hint: you might have this invention on your shoes, your coat, or your backpack.

Choose a function from the list your class wrote up. Can you imagine a machine or a product that could perform this function?

## Function Examples

### Function: Moving water

Your heart pumps blood through your veins. Big pumping machines push water to the tops of skyscrapers and across thousands of miles from lakes to cities. Sea animals like squid, octopus, and jellyfish pump out water from their bodies with a squirt, to give them power to move forward.

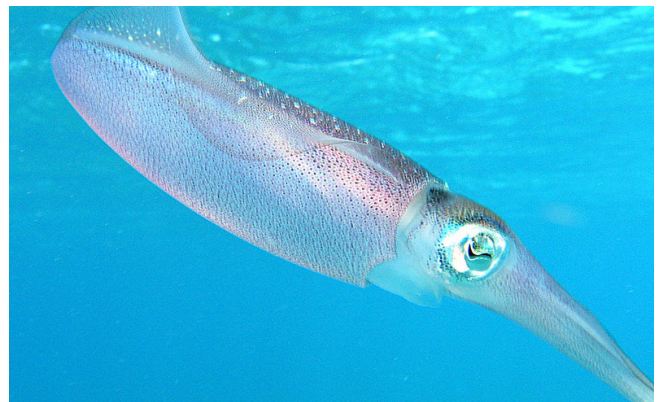
Engineers are always looking for ways to pump water that work better and use less energy.

### Function: Adhesion

Glues hold the many parts of your world together, from your sneakers to your desk at school. Burrs, tree sap, frog saliva, and many other natural substances have *adhesive* (sticky) properties. Scientists experiment to develop adhesives that are super-strong, non-toxic, and can stick and release easily when needed.

### Function: Filtering

The water you drink has traveled through a filter to remove pollution. So has the air you breathe in your school. Filters are designed to allow some items to pass through and keep out others. Baleen whales and sea



This squid has a built-in pump.



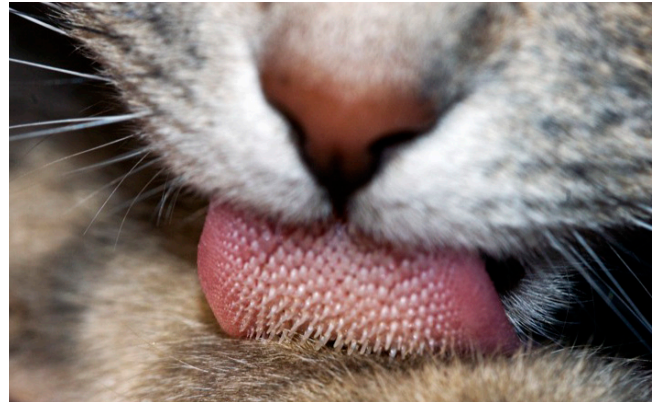
The mouths of baleen whales have food filters.

sponges take in their food through their own “natural” filters. And in all living things, the walls of cells filter out harmful chemicals.

Could scientists develop better filters by studying nature?

### **Function: Cleaning**

People can clean by rinsing, scrubbing or using detergents or other chemicals. Cats lick their fur, while leaves have a coating that helps water quickly run off, carrying dirt with it. What are some other ways nature cleans – and what could scientists learn from that?



**What function does a cat's tongue perform?**

### **Function: Transforming waste**

In nature, there's no such thing as waste. Every scrap is re-used by another living creature. In contrast, people produce about 96% waste for every 4% product. Could we learn a better way to produce what we make?



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