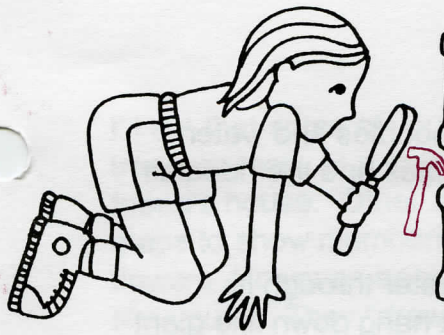
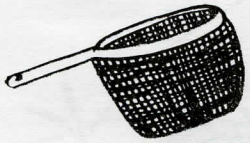


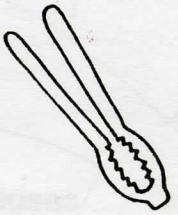
NATURE DETECTIVES

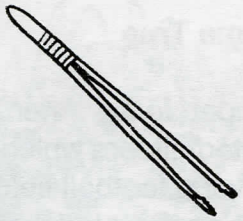
SPRING 1996

NATURAL INVENTIONS

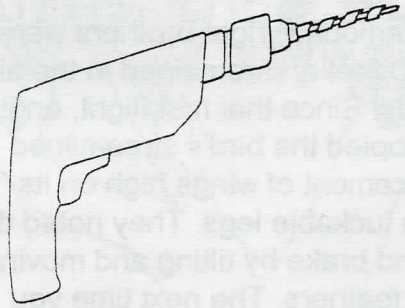


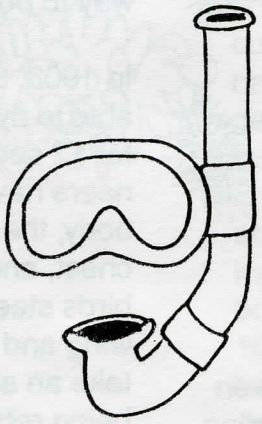
Where did people come up with the ideas for strainers, apartments, velcro, and air planes? By looking at the world around them. As you will see in this issue of Nature Detectives, many every day items were used by plants and other animals long before we got the idea.

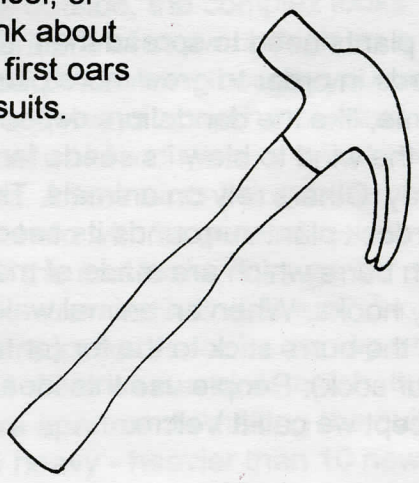




As you work with tools, think of the plant or animal that "uses" a hammer, a chisel, or glue. If you enjoy water sports, think about the first snorkel or scuba tank, the first oars and rudders, or even the first wet suits.







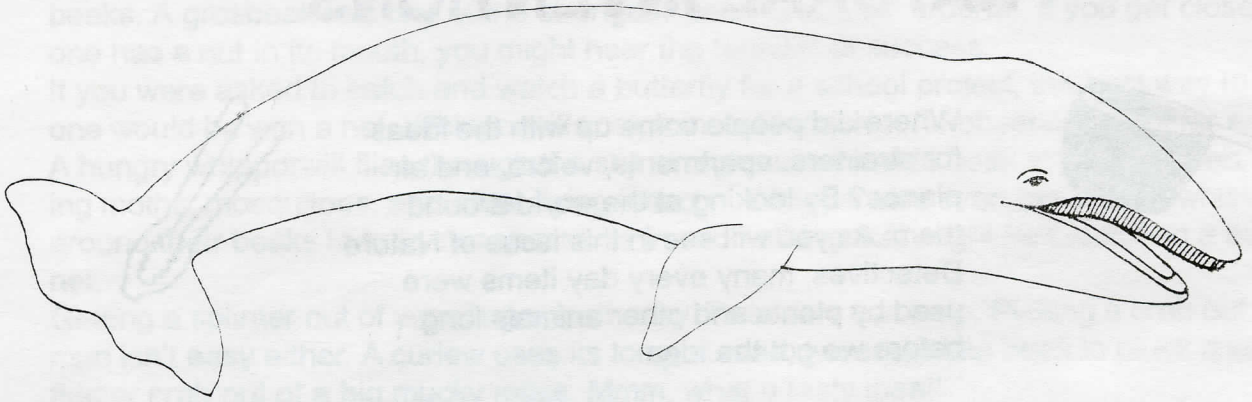
Air Down Under

Aquatic bugs and plants need oxygen, just like human beings. The water scorpion has a snorkel-like attachment to its rear. It keeps the snorkel at the surface and breathes through it. The cattail has air sacs in its leaves and stem. It uses these air connections like a snorkel to deliver oxygen from the air to its roots which are underwater.

A Whale Strainer

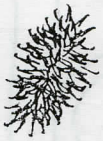
After you cook noodles, how do you get all the water out? I pour the noodles and water together through a strainer. Don't you? The water goes through the holes and the noodles stay put.

A special type of whale called a baleen whale eats by straining sea water through its mouth. Inside its mouth are baleen plates - huge fringed brushes that hang down like giant filters. The whale takes a big gulp of water, then forces it back out through the baleen plates. The whale swallows anything too big to pass through the baleen plates - things like krill, tiny shrimp-like creatures no longer than your finger.



Seeds That Stick

All plants need to spread their seeds in order to grow more plants. Some, like the dandelion, depend on the wind to blow its seeds far away. Others rely on animals. The burdock plant surrounds its seeds with burrs which are made of many tiny hooks. When an animal walks by, the burrs stick to the fur (or to your sock). People use this idea — except we call it Velcro.



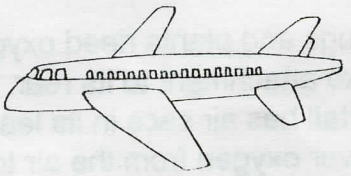
Fire Protection

Everyone knows fire is dangerous. Even firefighters protect themselves by wearing special safety suits. These suits are made of materials that don't burn. South Africa's national flower, the sugarbush, is often exposed to fire. It "wears" a safety suit too. These smart flowers cover themselves with little leaves made of tough, fireproof fibers.

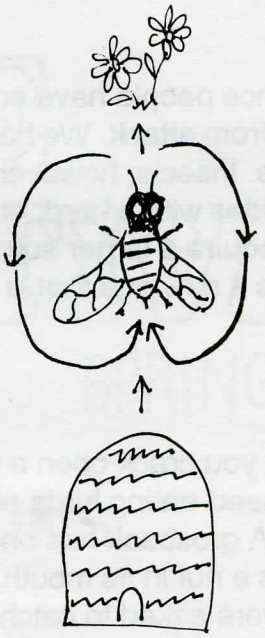
A Dream Come True

Humans have always longed to fly. After studying birds, they created gliders which could fly the length of several football fields. The invention of gasoline engines led the way to powered flight.

In 1903, the famous Wright brothers were able to fly 120 feet and remained in the air for 12 seconds. Since that first flight, engineers have copied the bird's streamlined body, the placement of wings high on its chest, and its tuckable legs. They noted that birds steer and brake by tilting and moving wing and tail feathers. The next time you take an airplane ride listen for the wheels being retracted and watch the flaps move on the plane's wings and tail.

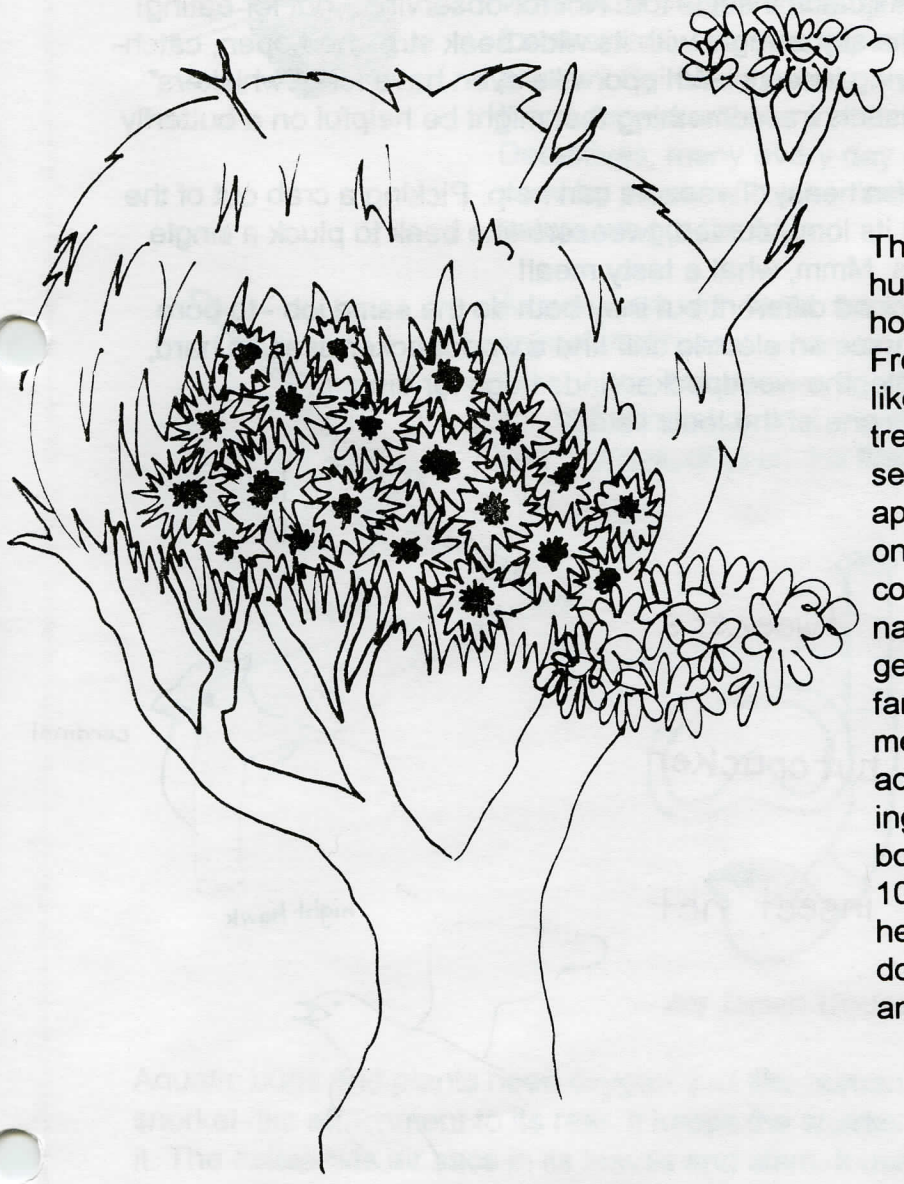


Bee Dance



I'll bet that some of you have drawn a map - maybe a treasure map, or a map of your yard, or how to get to a friend's house. Other animals make maps too. Bees make maps to show members of their hive where to go to find flowers. However, bees don't draw with a pencil and paper like you do. They "draw" with their bodies. In fact, they make their maps by dancing!

The pattern of a bee's waggle dance is a figure eight. The straight run through the middle of the eight shows the direction from the hive to the flowers. The speed of the dance tells how far away the flowers are. The slower the dance, the further away the nectar.



Bird Houses

The social weaverbirds of Africa build huge apartment complexes which often hold more than one hundred families. From the outside, the complex looks like a giant pile of straw up high on a tree. From the bottom though, you can see the entryways to each individual apartment which consists of a hall and one room. All the birds living in the complex help with its general maintenance. If the roof leaks, they go out and get some straw to fix it - but each bird family is responsible for its own apartment. As more weaverbirds hatch, they add more apartments making the building very heavy - heavier than 10 newborn elephants. After growing for about 100 years, the complex becomes too heavy for the branch it is on. SNAP!, down comes the branch, nests, birds, and all. Time to build a new home.

A Suit of Armor

Ever since people have engaged in warfare, we have needed to find ways to protect our bodies from attack. We have used helmets, shields, and even full suits of armor for that purpose. Insects, however, have been doing this for 500 million years. Insects protect their soft insides with a hard, outer shell called an exoskeleton. Just as humans grow and eventually require a larger suit of armor, insects grow and shed their exoskeleton. Then they produce a new one that is a size larger.

Beaks at Work

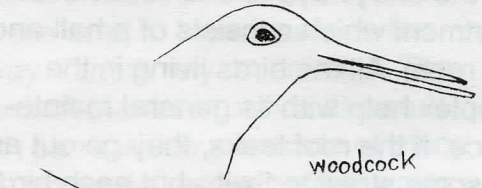
How do you crack open a walnut to get at the meaty middle? A nutcracker of course! When seed-eating birds need to get inside of a nut they use their short, strong, nutcracker beaks. A grosbeak has one of the strongest "seed crackers" around. If you get close while one has a nut in its mouth, you might hear the "crack!" of success.

If you were asked to catch and watch a butterfly for a school project, the best way to catch one would be with a net. Whipporwills catch insects too. Not for observing...but for eating! A hungry whipporwill flies through the sky at night with its wide beak stretched open, catching moths, mosquitoes, and other flying insects. Whipporwills even have long "whiskers" around their beaks to help sweep insects in...something that might be helpful on a butterfly net.

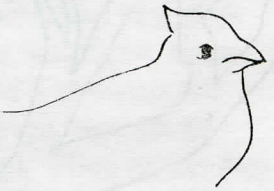
Getting a splinter out of your finger isn't easy. Tweezers can help. Picking a crab out of the mud isn't easy either. A curlew uses its long, curved, tweezers-like beak to pluck a single fiddler crab out of a big mucky mess. Mmm, what a tasty meal!

Whirr! Whirr! Tap! Tap! Tap! They sound different but they both do the same job - to bore round holes into wood. A carpenter uses an electric drill and a woodpecker uses its hard, pointed beak. In the newly drilled hole, the woodpecker finds bugs for dinner.

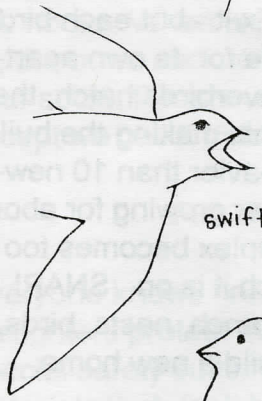
Can you match the beaks below with one of the tools listed?



tweezers



nutcracker



insect net