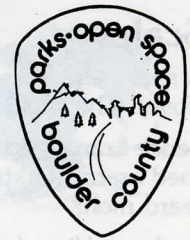


Summer
1987



Nature Detectives

"Who's been here?" "What were they doing and why were they doing it?" "When did it happen?" Nature Detectives try to answer questions like these by looking for clues and evidence of the activities of creatures in the outdoors.

Have you ever wondered about teeth marks on the trunk of a tree, or strange footprints in the snow or mud? If you have, then you are already a nature detective.

Theme:



Fur, Feathers, Slime and Scales

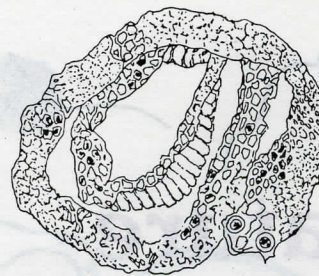
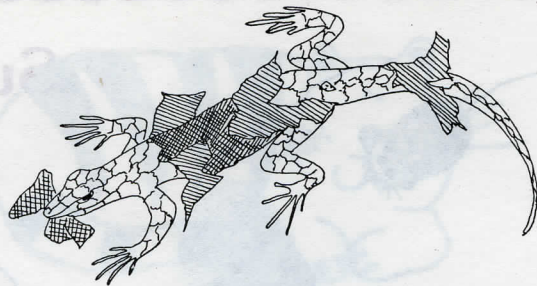


What is the best wrapping in the world? Need some hints?

1. **It keeps you in.** It keeps your bones, blood, guts, and muscles together.
2. **It never wears out.** As the top layer gets worn out, it is shed. New layers keep growing underneath.
3. **It is waterproof.** You don't leak, do you?
4. **It can fix itself.** It mends if it gets small tears or scrapes.
5. **It can keep you cool.** When you sweat, small droplets of moisture are squeezed out of your pores. As the droplets evaporate (dry up into the air), they take heat with them, making you cool.
6. **It can keep you warm.** Goose bumps are tightened areas around hairs, making the hairs stand on end. That traps warm air near your body. Shivering helps, too.
7. **It can sense the outside world.** Hot or cold, wet or dry, furry or smooth--nerve endings in your "wrapping layer" send touch messages to your brain about your surroundings.

The answer is...HUMAN SKIN!

All animals have skin. But all skin isn't the same. Read on to see how fur, feathers, slime and scales are variations of skin that go with different ways of living.



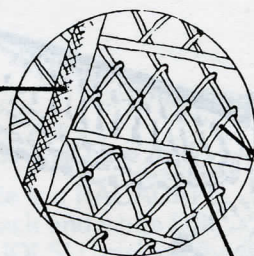
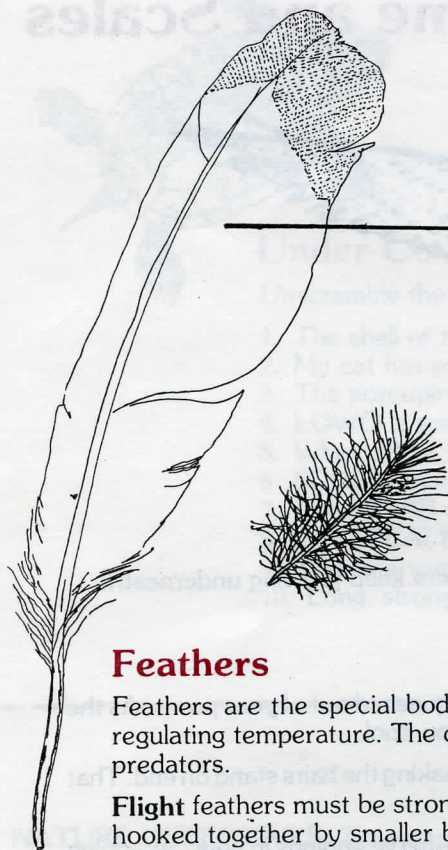
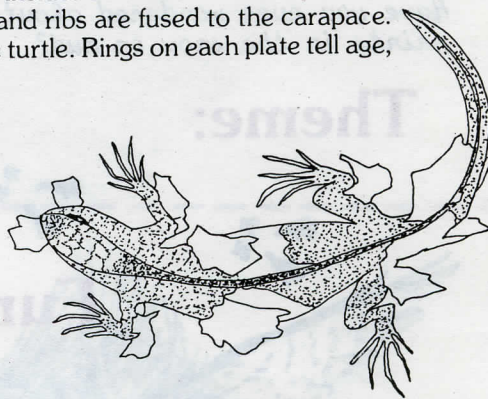
Scales

A snake sheds its cool, dry skin by slithering out of it. The left-behind skin is partly inside out (like taking off a glove). The snake looks snappy in its bright new underneath skin. But why does a snake molt?

Fence lizards and anole lizards rub away parts of their skin and for a while look very tatty. You hardly ever find a shed lizard skin, because the lizard eats it up. The minerals in it are much too valuable to waste. But why does a lizard molt?

Snake and lizard skin is made of scales. Not separate scales like fish have, but thick areas joined by thin areas. This makes the skin flexible, but not stretchy like human skin. So snakes and lizards molt the thin, horny outside layer of skin to let them grow. Colors for camouflage or colors for warning are in cells deeper in the skin which are not shed. The shed layer is clear or white.

Turtle skin grows horny plates to make a shell, called a carapace, to protect the insides of the turtle. Turtles cannot molt their shells when their insides need to grow, because their backbones and ribs are fused to the carapace. Each horny plate grows in all directions to make a bigger mobile home for the turtle. Rings on each plate tell age, almost like tree rings.



barbule

barb

rachis

Feathers

Feathers are the special body covering of birds. Feathers are well-designed for flight as well as important in regulating temperature. The colors and patterns of feathers help birds find mates, warn intruders, or hide from predators.

Flight feathers must be strong, yet light and flexible. The center shaft, or rachis, holds rows of barbs which are hooked together by smaller barbules making the blade or flight surface. Owl feathers lack barbules. The soft, fringed barbs allow silent flight for better mice catching. Stiff **contour** feathers form the streamlined shape of the bird and reduce wind resistance. Soft **down** feathers grow next to the skin. When fluffed, down traps air making "thermal underwear" for cold winter nights.

Birds spend much time **preening** or caring for feathers. The bird wipes its beak across an oil gland above the tail. As each feather passes through the beak, it is oiled, the barbs are lined up, and stray barbules are rehooked. This is routine, pre-flight maintenance-just like airplanes need!



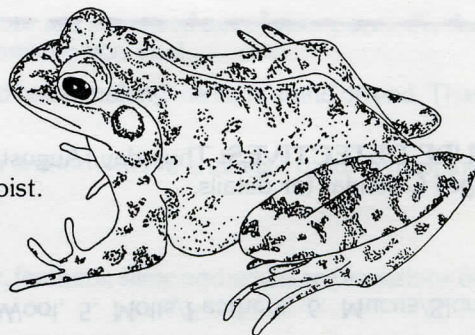
Fur

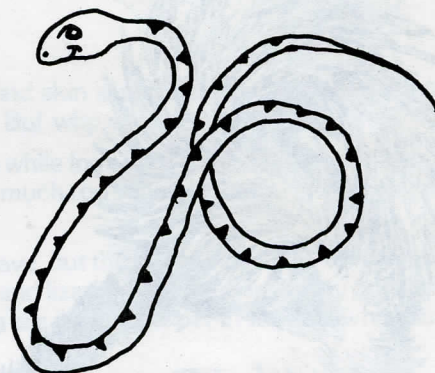
Mammal fur coats come in many sizes and colors, from small, brown or gray mouse-sized coats to big, black bear-sized coats. Fur may be stripy like chipmunks or spotty like spotted bats, or stripy and spotty like thirteen-lined ground squirrels. Face fur may look like a mask--badgers and raccoons. Ermines and snowshoe hares change coats with the seasons--brown in summer, white in winter, splotchy in between. And some fur comes in bold, warning patterns--do you know which black-and-white fur says, "WATCH OUT!"?

Fur helps to keep the mammal warm--the underfur of beavers and muskrats is groomed with oil and helps keep the skin dry. Trappers prized the thick winter fur for pelts. Deer hair is hollow, making it a good insulator against cold air.

Fur may be soft like the red fox, silky like the kangaroo rat, or sharp like porcupine quills. The barbed quills lie under guard hairs and may be raised in alarm. They easily stick to things which brush against them. Mammal skin may not be furry at all but sometimes scaly like the beaver's tail and feet or the skin of an armadillo.

Skin, amphibian style, is permeable. It
 Lets oxygen and water pass through.
 It can get dried out, but
 Mucus, a secretion from skin glands, keeps skin moist.
Every frog needs slime.





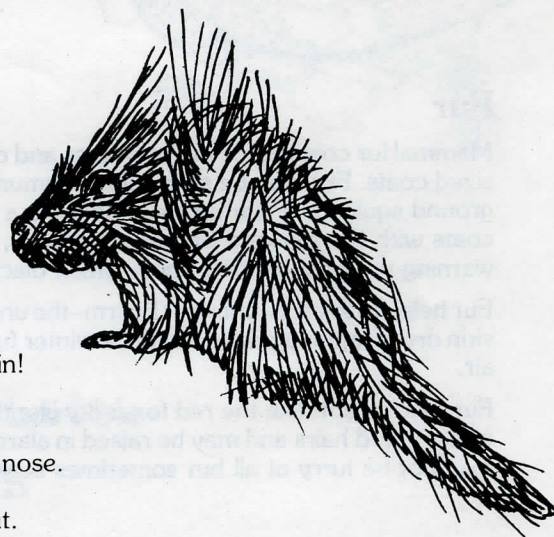
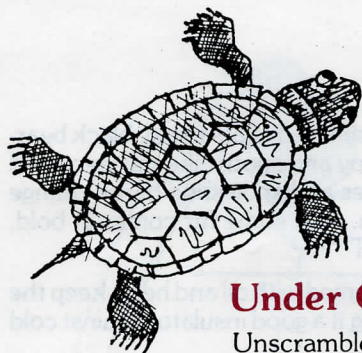
Pet to Pet

Nobody wants to stroke my frog
Who is clammy and covered in slime.
Nobody asks to pet my snake
Who is scaly and dry all the time.

They like to hold my hamster best.
She's honey-gold and furry.
Or cuddle up with stripy-cat
Who's soft and smooth and purry.

But animals are more than skin --
That's just the part that keeps them in.

Frogs and snakes need loving, too,
Just as cats and hamsters do.



Under Cover

Unscramble the words -- all have to do with skin!

1. The shell of a turtle is a RACACAPE.
2. My cat has soft black and white URF.
3. The porcupine's LIQSU prickled the dog's nose.
4. LOWO is spun from the coat of a sheep.
5. When a bird SLOMT, its RETHAFES fall out.
6. SCUUM makes a frog's NISK slimy.
7. The SRABB on a feather keep the SLEDAB hooked together.
8. Fish ESCALS are separate, but snake CASSLE are joined.
9. Trappers used to sell beaver SLEPT to make hats.
10. Long, strong hairs on a mammal's face are called SHERWIKS.

NATURE DETECTIVES: Thursday, August 13--Meet at Walden Ponds for special activities and a walk. See Images Calendar for details.

Answers to Under Cover: 1. Carapace, 2. Fur, 3. Quills, 4. Wool, 5. Molts/Feathers, 6. Mucus/Skin, 7. Barbs/Blades, 8. Scales/Scales, 9. Pelts, 10. Whiskers