

BUGS, BARK, BIRDS, AND BOYS

Learn to be a nature detective, an explorer or scientist! There are exciting things outside! A bug hidden under a leaf, footprints in the mud, or a pile of fur and bones. Learn to explore the world around you, looking for clues and signs to solve the mysteries of Nature. Nature mysteries can be found anywhere; in your yard, the woods, or a pond, puddle or stream. Some of the clues can only be found during a certain time of the year, while other signs can be found all year.

Good nature detectives and explorers have a sense of adventure. They also remember to leave only footprints as clues to the wildlife that they have been in an area.

Primary Tools

Eyes - To closely inspect any find, and to search an area.

Ears - To listen for any sounds of animals moving or communicating.

Nose - To sniff out suspects, use your nose to smell a flower or an animal.

Hands - To feel all the parts of a clue, to turn over logs and leaves or to feel the shapes and textures of things.

Rules For Nature Lovers

- Never take all the leaves and flowers from a plant. Take just what you need.
- When you pick a flower, break or cut the stem. Don't pull the plant up by the roots.
- Don't taste or eat any plants, berries or seeds you find outdoors. Some plants are very poisonous. Check with an adult.
- Don't pick a flower from anyone's garden or backyard without asking permission. Remember that in many public parks and gardens, flowers must not be picked.
- Don't pick a wildflower if there are only a few of its kind growing where you find it. Greedy picking might mean this kind of flower will not grow in that spot anymore. Then no one else will ever be able to enjoy it again.
- Never touch poison ivy, poison oak, or poison sumac. Touching these plants creates an itchy rash on the skin. **REMEMBER: " LEAVES OF THREE, LET IT BE"**
- Dress according to the seasons, and keep in mind that a good nature detective checks out all clues and sometimes this means lying down on your belly, crawling on your hands and knees and even stepping into water. So wear old clothes and sneakers.

Bugs

Did you ever see a bug creature up close? Most grown-ups would much rather do their looking from a distance, but kids like to catch the bug and confine him temporarily for a closer look. That's okay, but too often the confinement takes place inside a mayonnaise jar with a perforated lid. The bug may be safe inside, but a kid chasing after a butterfly while clutching the glass jar might not be. And maybe the bug is safe, but is he really happy? It gets pretty hot and damp inside a jar, and sometimes it's difficult to climb glass walls.

So what do you do?

Make a Creature Cage

MATERIALS:

2 empty (*washed*) tuna cans

Wire Screen

Scissors

Remove lids and labels from tuna cans. Make sure there are no sharp edges, and then wash the cans thoroughly. Wire screen cuts easily with scissors. Cut a length of wire screen about 6 inches wide and long enough to go around the inside of the can, plus an inch. Bend the screen into a tube to fit the inside size of the cans. Fasten the screen in that shape by first stripping a few wire strands from the outside overlap edge and bending the exposed row of wire prongs inward. Then fit the prongs through the inside screen, bending the prongs over and shut. Fit the cans over each end of the screen tube to complete the bug proof CREATURE CAGE.

Wormy Experiment

Try this experiment to show your den how worms work. Put four to five inches of rich soil in a large glass jar with about 6 earthworms. On top of the soil, put an inch of light sand. Sprinkle corn meal on the sand. Wrap black paper around the jar to shut out light. At your next den meeting, take off the paper and see what has happened. The worms will have moved dark soil up into the sand the sand down into the soil. You will see tunnels along the glass marking their travels. Explain that the worm tunnels bring oxygen and nitrogen to nurture life and that the tunnels help the soil hold water.

Web (Printing) Painting

Take a walk in the woods with a can of spray paint and a piece of white paper. Find a spider web. Webs are usually found between branches of bushes or between two growing things, such as weeds or garden flowers.

Hold the can of spray paint at arm's length away from the web. Spray quickly with a back and forth motion. Be sure the wind is blowing away from you when you spray paint so you won't breathe in any of it.

Cover the web with a thin coating of paint. The paint will look like tiny beads on the fine strands. Quickly place a piece of paper on the web. It is better if you curve the paper first in the center of the web and straighten it out very carefully along the sides.

Let the web dry on the paper. Your finished print will contain some of the web.

Night Creatures

Your backyard is part of your environment. You share it with all sorts of busy little creatures. There are some you usually don't see because they're nocturnal. That means they're active at night. Here's how to have a look at them without staying up all night.

Things you will need include:

- A wide-mouthed glass jar
- A garden trowel
- A small, flat piece of wood
- A few small stones or small wooden blocks

1. You're going to set up a trap for night creatures. It won't hurt them; it will just hold onto them until you get a look at them. You need to dig a hole in the ground for this. Ask permission before you dig.

2. Make a hole in the ground big enough to hold your jar. It should be deep enough that the mouth of the jar is level with the ground.

3. Cover the jar with a flat piece of wood. Use stones or blocks to hold it about half an inch above the jar. Your cover will keep the rain out. If rain got into your jar overnight, it could drown your captives.

4. Check the jar the next day. See what is there. Be sure to let the creature go!

Caterpillars and Butterflies

Look for cocoons attached to stems and leaves of grasses. Look for caterpillars inching along stems. They often do great damage to plants. Look for partly eaten leaves and flowers which are clues to caterpillars. This picture shows the life cycle of a butterfly.

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Basic Food chain or Ecosystem

Animals and plants live together in communities called ecosystems. All the living things in an ecosystem are linked together in food chains. Here's an example of a food chain.

Hikes

Leading a Nature Hike

Don't be afraid to say "I don't know" to the boys. After all, none of us has all the answers. You will command more respect in the eyes of the boys if you admit it.

However as a leader you have the duty to find the answer. Therefore you should say "I don't know but I will find out and let you know".

As you start the hike have one of the boys pick up two small sticks, each about 1 foot in length. Push the first stick in the ground. Locate the end of the shadow cast by that stick and place the other stick in the ground at the end of the shadow. Ask the boys if they think the shadow will be in a different position at the end of your hike. If they think the shadow will move, ask them which way. At the end of the hike stop back and check the sticks.

Remind boys to be as quiet as possible since animals are easily frightened and can hear sounds from long distances. During the hike if you wish to take a rest break, have the boys sit in an open area and ask them to be quiet for about 15 minutes. At the end of the time, ask them what sounds they heard.

The use of all five senses should be emphasized. It is not enough to merely look and listen, but they should taste, feel and smell, too. A frog and toad look pretty much alike, but how do they feel? The frog has a smooth skin and the toad has a rough skin. Crumble a handful of dry sycamore leaves and you'll find they smell like cinnamon. Let them feel the velvet softness of the fuzzy branches of the stag horn sumac. Even if the boys don't remember the name of this shrub the next time they see it, chances are they'll remember how it feels. That is more important. Take care in what the boys taste. Some berries are poisonous - others are edible.

After a cool night, look for spiders in the warming sun rays. Often they are found on goldenrods at the edge of the woods or in the field. Take a strand of web between your fingers and show how the spider will go up and down the web strand like a yo-yo. If a breeze comes along, the spider might 'fly'. Actually, this is known as ballooning. Often the wind will carry a spider and his web strand several hundred feet into the atmosphere.

Try a night hike in the woods. Have the boys identify objects in the dark. What can they tell about it? Is the tree's bark smooth or rough? Is there any particular odor connected with it? Get to know plants and trees without the use of your eyes.

At the end of the hike, get each boy to describe what he liked the most. You'll find they usually remember the simple things. **Don't worry about your knowledge. Get out in the fascinating world of nature and enjoy it with your boys.**

Types of Hikes

NATURE HIKES - For observation, for listening.

TREASURE HIKES - A trail laid out with treasure at the end.

HISTORICAL HIKES - To historical landmarks.

SNOOP HIKE - Explore, be aware, notice oddities, be snoopy.

CRAFT HIKE - Gather nature items for a craft project.

BABY HIKE - Look only for 'babies'. Make a list. Birds, fern, leaf.

DETECTIVE HIKE - Spot and list all evidence of man in nature, even litter, which can be picked up and put in the litter bag you have with you.

HEADS-TALES HIKE - Toss a coin each time you reach a crossroads. Turn left if the coin says heads, turn right if tails.

BREAKFAST HIKE - Reach the destination in time to see the sunrise, and then cook breakfast.

RAIN HIKE - Go dressed in raincoats and boots to observe nature in the rain.

COLLECTING HIKE - Collect whatever your family show an interest in: rocks, leaves, shells, seeds, fossils, insects, oddly shaped sticks.

Tracks of All Kinds

How to Cast Animal Tracks

Materials:

Plaster of Paris

A measuring cup

A tin can (*2 lb coffee can*)

Paper cups
Strips of light cardboard (2" wide, 12-24 inches long)
An old toothbrush
Water
Paper Clips

A mud bank near a stream is a good place to look for tracks. After a rain, look around sandbars, ditches and gullies. When you find a good, sharp imprint, clear the ground around it. Be careful not to disturb the print. Encircle the print with light cardboard strip. Secure with paper clips. Press the paper collar into the ground, so the poured plaster doesn't seep out. If the ground is too hard, build up dirt around the outside of the collar. If the print is in loose sand, spray it with a cheap hair spray to prevent its crumbling. If the ground is very muddy, sprinkle some dry plaster on the print and the area around it to soak up excess moisture before proceeding.

Mix plaster of Paris in the tin can. Use about 1 2/3 cups plaster to one cup water. You need a consistency like pancake batter - neither too thick nor too thin. Stir until it's smooth and creamy. Let stand in can two or three minutes, and then pour slowly and gently into track. Let set about 30 minutes, then pick up cast gently, brush off dirt.

Note: The first cast of the animal's track is the negative. The second cast or positive shows the track as it actually looked on the ground. This can be painted to emphasize the track.

To make the positive cast, smear the 'negative' with a coat of Vaseline. Mix plaster as before. Set collar around negative. Pour in plaster. When nearly dry, scrape date, location, animal's name, etc. on back of cast for a record. When hard, remove the 'positive'.

Tree Tracks

Other places to look for tracks are on leaves and tree trunks. Have you ever wondered about those lace-like trails on leaves or fancy carvings on the surface of wood? They're footprints! Leaf miners are the larvae of insects that live within leaves and feed on the leaf's internal tissues. Bark beetles also leave tunnel tracks. Adult beetles carve out a tunnel under the bark of trees then they lay their eggs. If you find bark in the area, look for tiny holes. This is where the beetle emerges when it becomes an adult. It bores a hole to get out of the tree where it hatched and flies to a new tree.

Leaf Prints

You can make permanent copies of your favorite leaves using plaster of Paris.

Materials you will need:

A leaf
Plaster of Paris
Shallow dish that is bigger than the leaf
Vaseline
Water
A jar
An old spoon

Lay the leaf on the dish with the underside (*the veined side*) facing upwards. Rub a little Vaseline on the leaf. Put a little water in the jar. Carefully spoon plaster of Paris into the jar. Stir the mixture with a spoon. Keep adding plaster little by little until the mixture is like toothpaste. Carefully spread the plaster over the leaf so that it is evenly covered. Then fill the dish with the rest of the plaster. Work quickly. Leave plaster to dry. This will take about half an hour. When dried, you can lift it out of the dish. Carefully peel off the leaf. There in the plaster is a cast of your leaf!!

Bark

Trees are living things. They are growing wood for our use. There are two kinds of trees...

- **DECIDUOUS** trees which drop their leaves in winter.
- **EVERGREEN** trees which keep their leaves all year round.

When trees get old and big, they are ready to be used. Foresters cut these trees before they get sick. This gives little trees more room to grow.

How Tall Is A Tree?

Here is a useful trick you can use to measure trees and other tall things too.

Materials you will need:

A partner

A pencil

A tape measure or ruler

- Find a tall tree that is standing on fairly flat ground.
- Back up from the tree. Stop when you are farther away from the tree than the base of the tree is from its top.
- Ask your partner to stand right at the tree.
- Hold a pencil straight up and down. Grasp it near its end. Close one eye and hold the pencil so that it lines up with the tree.
- Move forward or backward until the part of the pencil above your thumb looks like it is as tall as the tree.
- Carefully turn the pencil sideways keeping your thumb lined up with the tree trunk. Your pencil should now look like it is lying along the ground.
- As your partner to walk away from the tree. It will seem as if he is walking along the pencil. Tell him to stop when he is lined up with the end of the pencil.
- Measure the distance from the base of the tree to the place where he is standing. This is about the height of the tree.

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Stumps Tell a Story

If you come upon a dry tree stump, you can take a rubbing that will tell you the tree's life story.

Materials you will need:

Paper big enough to stretch across tree trunk

Thumb tacks

Charcoal

1. Stretch the paper across the stump, tack it down.
2. Rub the charcoal across the paper. Rub in just ONE direction.
3. Soon the tree rings and other marks will show through. When done, take the paper off the tree.
4. While you are still at the stump, mark the center of the tree on your rubbing. Count off the rings and mark every tenth year.

Here's what to look for to reveal your tree's story:

1. The number of rings tells you how old the tree was when it was cut down.
2. Look at the growth rings. Are some wider? These probably show years when there was lots of rain. Are some narrower? These may have been dry years.
3. Was the tree growing evenly in all directions? If it grew more on one side than the other, can you see any reasons for it? For example, was it crowded on one side?

Bark Rubbing

Materials:

Thin sheets of white paper

Crayons

Masking tape

Find a tree with interesting marking on its bark. Use masking tape to tape the paper to the tree.

Rub the side of the crayon over the paper until the markings on the bark show up clearly on the paper.

New Paper from Newspaper

Recycle some paper and do your part to save trees.

Materials you will need:

8 pages of newspaper

Extra newspaper

A plastic bucket

A medium size saucepan

Liquid dishwashing detergent

A colander

An electric blender

A large mixing bowl and stirring spoon

A square of fine wire mesh, about 8x8

10 to 12 clean absorbent cloths

A heavy book or other weight

- Tear the newspaper into long, thin strips. Put the strips in the bucket and cover them with tap water. Leave them to soak overnight.

- Next morning, pour off any water that has not soaked into the paper. Put the paper into the saucepan. Add 1 tablespoon of liquid detergent to the saucepan. Cover the paper with water again.

- Put the saucepan on the stove, and heat it on low heat for 2 hours. Every once in awhile, check to make sure the paper is still covered with water. Add a little water if you need to.

- Over the sink, carefully pour the mixture of water and paper mush from the saucepan into the colander. The water will pass through, and the paper mush will stay in the colander.

- Run cold water over the paper mush in the colander. Stir the paper a bit to help the water strain through.

- The next step uses the electric blender. Don't use the blender without permission from a grownup. Take a handful of soggy paper and put it into the blender. Add water until 3/4 full. Turn blender on for a few seconds then turn off. Continue switching for about 1 minute.

- Pour the blended mush - called pulp - into a large plastic mixing bowl.

- A handful at a time, blend the rest of the pulp. Always add water to the blender as necessary. Put all the pulp in the bowl.

- Add water to the bowl of pulp until half full. Use a large stirring spoon to stir the water into the pulp.

- Lay an absorbent piece of cloth on a flat surface. Slide the wire mesh into the bowl. You want to get a thin, even coating of pulp on the mesh. If the first dipping doesn't work well, try again.

- Bring the coated wire mesh to the cloth. Quickly and smoothly lay the mesh on the cloth, pulp side down.

- Press the mesh hard against the cloth. Now lift the mesh, leaving the pulp behind on the cloth. Put another piece of cloth over the pulp. Press hard again.

- Repeat until all pulp is gone. Layer the pulp like a sandwich with many layers of cloth and pulp. Put a heavy weight on top of the stack to keep it pressed for 24 hours.

- Carefully peel off the pieces of damp paper and put them on newspaper to dry. Now you can make your own recycled cards or decorated notepaper. And you can print on the back: recycled by...to save a tree!

Terrariums

Using a Zip Lock Baggie

Bag a terrarium on your next nature walk or outing. It's quick, easy and shows the boys that nature doesn't require a lot of fancy equipment to work.

Materials you will need:

Zip lock baggies

Small rocks

Charcoal

Soil

Plant cuttings

Layer baggie with several rocks, crushed charcoal and soil. Gently plant cutting into soil. Before sealing zip lock bag completely, blow carefully into bag and then seal. This will fill the terrarium with carbon dioxide and moisture. Plant should require no other care except occasionally blowing into baggie to replenish moisture.

Using a Bottle or Jar

Materials you will need:

A large clear glass bottle or jar with a lid

Small pebbles

Some charcoal briquettes

A bag

A hammer

A strainer
Potting soil
A piece of stiff paper
Newspaper
A few small green plants, such as maidenhair, ferns, miniature ivy and mosses.

1. Wash and rinse your jar. Spread out some newspapers to make a work surface. Wash any dirt off the pebbles.
2. Put pebbles in the bottom of the jar about 1 inch deep.
3. Break up charcoal into small pieces. (*Put charcoal into a bag and break it with a hammer*) Then pour the broken charcoal into a strainer and wash it with water.
4. Put one layer of charcoal into the jar on top of the pebbles, about 1/2 inch deep.
5. Make a funnel by rolling a piece of stiff paper. Put the funnel into the bottle and pour the potting soil through it. The funnel keeps the sides of your bottle from getting dirty. You will need about 2 inches of soil.
6. To plant your plants, don't plant them too close, remember that the plants will grow and fill up the space. Make holes in the soil for the plants. Gently lower the plants into the jar and set them into their holes. Pat the soil down firmly around the base of each plant.
7. Add a small decoration to your jar, such as a shell or piece of driftwood.
8. Water the garden. It should be moist but not soaked. Put on the lid. As long as the lid is on your garden will need only a little water every month or so.
9. Water your garden LIGHTLY. If the glass fogs up with water, your bottle garden has been watered too much. If this happens, take the lid off for a couple of days to let it dry out.
10. Put your garden where it gets light, but don't set it in direct sunlight. **ENJOY!**

How Plants Grow

Nature has given plants a powerful will to grow, and all you have to do is assist her by supplying their basic needs -moisture, light, air, food and space. Here are some growing experiments to help you understand the growing process more clearly.

Germination

Seeds need moisture and warmth to germinate. To watch them grow, line the inside of a glass jar with a piece of wet blotting paper. Between the blotter and the glass, place birdseed, radish or grass seed that has been soaked overnight in warm water. Put an inch of water in the bottom of the jar so the blotter will stay moist. Watch for the seeds to develop roots and tiny leaves in a few days. To show the effect of warmth, prepare two identical glasses and set one in the refrigerator.

Root Growth

To show how strong is the instinct of plants to grow with their roots downward seeking a supply of moisture, put a cover on the jar with the sprouted seedlings and turn it upside down. In a day or so the roots will turn downward toward the supply of water.

Stem Growth

Stems grow upwards with equal force, seeking air and light. To observe a plant as it twists its way toward the light, make an obstacle box from a one-pound cracker box or shoe box. Cut a window about 2"

x 3" near the top. Cut two pieces of cardboard as wide as the box and tape them to the sides. Bend them down, leaving a small space. At the bottom, set a small pot with a bean seedling growing in it.

Need of Water

To trace water through plant tissues, make a fresh cut at the bottom of a carrot and piece of celery. Soak for a while in water then place in a fairly concentrated solution of red ink or dye. After a few hours, cut the carrot from top to bottom and cut across the celery stalks.

In the celery, you will find color even in the veins of the leaves. Bi-colored carnations, sometimes seen at the florists, are made by splitting the stem partway and putting each half in a different color. Try this with other white flowers, if available.

To see for yourself the way plants drink water through their stalks, and where the water goes, tint a white flower. Fill glasses halfway with water and enough food coloring to tint

the water a bright color. Add a white carnation or a white daisy. Watch the flower turn green, yellow, red, or blue over the next few hours.

Go On a Sock Walk

Lots of plants need animals to spread their seeds. Some seeds are inside fruit. Animals and birds eat the food. Then the seeds pass right through their digestive systems and end up on the ground again, somewhere else. Some seeds catch in animal's fur. They get spread around as the animals move from place to place.

Put on some woolly socks and see how many seeds you can pick up.

You will need; fuzzy socks, a magnifying glass, a place to walk and a day when weeds have ripe seeds in the fall or spring.

Pull the socks on OVER your shoes. Go for a walk through the weeds in a field or park. Take off the socks and see what seeds you've picked up. Are some seeds hard to pry off? Take a look at them through a magnifying glass to see what kind of 'hooks' they have. You might try planting the seeds to see what kinds of plants come up. Egg cartons make good planters. You can put a different kind of seed in each place.

Run-Away Seeds in Your Front Lawn

Lawns are often covered with white, ball-shaped dandelion heads. Blow one into the air. Catch some heads and inspect them closely. Attached to the hairs are brown specks. Inside these hard coats are the dandelions seeds. The silky hairs act like parachutes that carry the seeds far away from their starting place to spread the seeds.

Each dandelion flower releases hundreds of tiny, light seeds to the wind. For a seed to grow, it needs to land in an area with right soil, enough moisture, and plenty of sunlight. How many seeds from one dandelion plant are likely to land in a spot that's good for growth? Not very many.

Kitchen Leftover Plants

Did you know you could raise a lacy, fernlike plant from a carrot top - or a fast growing vine from a sweet potato? You can grow a whole garden from the seeds and cutting of fruits and vegetables. For your plant, cut 2 inches off the top of a carrot (including the leaves). Set the carrot, cut side down, in a dish with 1/2 in of water in it. Change the water often. When roots appear, plant our carrot in a pot of moist sand. Set it in a sunny window and keep it wet.

To start a sweet potato vine, stick three toothpicks in the sides of an old sweet potato. Set it in a glass of water with the toothpicks resting on the rim. The water should just cover the top of the sweet potato. Put the glass in a place where the vine will get filtered sunlight. Pin up some strings so it can climb.