

Four Winds Nature Program - Patterns in Nature

Connections with Farm to School and Forest Days/Outdoor Learning Programs

When we study the characteristics of living and non-living things, we find patterns of similarity and differences that help us begin to understand how things are related. Such patterns may be useful in sorting and classifying different living things: plants with five petals, animals with four toes, or insects with two wings. By studying a group of organisms, we find that we can learn more about each of the individual species when we examine both the things they have in common and those that make them unique. Patterns and variations help us organize non-living things as well and often prompt questions about why the patterns occur.

Throughout this yearlong theme, children will examine the characteristics of living and non-living things, recognizing patterns of similarities and differences and their relationships. They will practice sorting and classifying as well as describing and recording why objects or organisms belong in a certain group.

All Sort of Insects

Students will: learn basic insect anatomy and observe the variations that distinguish one insect from another; construct insect models to identify common features and differences in insect anatomy; sort insects into groups based on similar features; gather evidence of insects and other arthropods living in schoolyard; and observe patterns of insect movement.

Farm to School

- Learn about different types of insect relationships (predator-prey/parasitic/mutualistic) and look for examples in and around school garden or compost.
- Consider the many roles of insects in a garden and look for evidence of various activities such as feeding on plants, protecting plants, or pollination.
- Ask local farmer to share photos of insects on their farm as well as how these insects effect their crops and/or animals.

Forest Days/Outdoor Learning

- Explore insects outside and try to classify them into groups based on body features and movement.
- Model different insect activities and interactions (feeding, traveling, building, pollinating) through skits.
- Carefully collect a live insect in a jar, observe, and draw in nature journal. *No bees, wasps, hornets, or bee-like insects!*
- Model different patterns of insect movement such as crawling and hopping.

Leaves

Students will: identify physical features of leaves and associated vocabulary; learn about venation patterns in leaves; collect a variety of leaves outdoors and sort by patterns of similarity and difference; identify tree leaves by shape, color, and vein pattern; identify and describe key physical characteristics of leaves; and create a collage of leaves or make leaf prints/rubbings.

Farm to School

- Examine the different types of leaves that can be found in school garden; consider why we eat

some vegetable leaves and not others.

- Visit a local farm to observe leaves on different plants, looking for key features and evidence of feeding or disease.
- Explore the importance of leaves for photosynthesis and plant growth.
- Add organic material to school garden or compost by raking up and collecting fallen tree leaves.

Forest Days/Outdoor Learning

- Collect and observe leaves outdoors, drawing or making rubbings of several different leaves in nature journal.
- Sit at sit spots and observe falling leaves, noticing the way size and shape influence the way they move and considering why some leaves fall before others.
- Create a story using leaves, arranging them in different shapes to depict people, animals, places, and natural features such as hills and clouds.

Conifer Clues

Students will: examine and match cones of the same species using only sense of touch; sort and identify cones by patterns of similarity and difference; use written and picture clues to match cones to their evergreen branches; notice patterns in conifer branches and match them to trees outdoors; record observations of conifers and other seed-bearing structures; and observe and mark the spiral patterns of scales on conifer cones.

Farm to School

- Compare conifer cones to other seed-bearing structures found in the school garden.
- Consider the difference between evergreens and perennials that lose their leaves in winter.
- Visit a tree farm growing conifers; compare these conifers to ones growing in an unmanaged forest or a managed woodlot with other species of trees.

Forest Days/Outdoor Learning

- Search for conifer cones on the ground to examine closely.
- Sketch outlines of various conifer trees in your nature journal and compare how they differ in size, shape, and arrangement of cones.
- Look for evidence of birds, squirrels, and other animals feeding on conifer cones and consider how cones serve as an important winter food source.

Snowflakes

Students will: observe snow crystal photos and sort into categories based on design features; use temperature and humidity data to predict possible snow crystal type; create six-sided snowflake models; model formation processes of sleet, freezing rain, and graupel; collect real snowflakes outside and record observations; and create snow sculptures.

Farm to School

- Investigate the importance of snow cover to prevent winter burn on perennial plants.
- Ask local farmer to share how snowfall in winter influences their growing season in spring.

- Create snow sculpture scarecrows around school garden.
- Eat sugar on snow with maple syrup from a local sugar maker.

Forest Days/Outdoor Learning

- Model the formation of different types of winter precipitation through skits.
- Make snow sculptures/snow art at sit spots, considering how snow type influences ability to form snow into shapes.
- Look at snow crystals up close and draw them in nature journal.

Track Detectives

Students will: model the four basic animal track patterns and learn their connection to varying body shape and size; compare size, shape, and number of toes on different animal footprints; interpret track stories using pattern, place, prints, and other clues to determine an animal's identity and activity; record familiar animal tracks, and create a picture story using track stamps.

Farm to School

- Examine tracks around the school garden and consider how animal presence or behavior changes from winter into the growing season.
- Ask local farmer to share photos of tracks or track stories from their farm.
- Compare the tracks of domesticated animals to the tracks of animals in the wild and note patterns of similarity and difference.
- Look for evidence of animal activity around the school compost and record observations.

Forest Days/Outdoor Learning

- Look for tracks outside; try to identify which animal made them and tell a story about their activity.
- Draw a picture of your favorite animal track.
- Design an imaginary animal, thinking about what their tracks would look like based on body shape, size, habitat, diet, and activity.
- Model moving like various animals, using the four basic animal track patterns.
- Create your own tracks to leave behind in the snow or mud and try to interpret each others' track stories.

Feathering the Nest

Students will: investigate a variety of birds' nests and document the materials used in their creation; view examples of different nest types and the birds that build them; match birds with their nests; use a scientific key to identify five birds' nests; and model nest construction and experience the challenges birds face when building nests.

Farm to School

- Look for evidence of birds and nest-building activity around the school; consider how a garden may be good habitat for birds and how birds may help protect garden crops.

- Ask local farmer for a list of birds nesting on their farm.
- Visit a local farm with nesting boxes for chickens and consider how these nests differ from those of wild birds. Experience collecting eggs, if possible.
- Make and eat “bird nest” noodle bowls “feathered” with ingredients that resemble materials used to build real bird nests, such as kale and thin-sliced carrot strips; add cherry tomato “eggs”.

Forest Days/Outdoor Learning

- Build (or paint pre-built) bird houses to put up around the school grounds.
- Construct nests using natural materials found outdoors, remembering that nests must be able to keep eggs safe and warm.
- Model being a ground-nesting bird at sit spots, keeping in mind adaptations of stillness, camouflage, and distraction to protect eggs and young.

Animal Disguise and Surprise

Students will: use a model to learn how matching color and pattern help to conceal an animal; view examples of protective coloration; use a model to investigate how camouflage can lead to increased survival; observe how color, shape, and texture affect our ability to notice objects; and construct a model of a creature that will blend in with chosen habitat.

Farm to School

- Look for evidence of insects using protective coloration to blend in with garden plants; note which insects don’t blend in and consider what they may be signaling with their bright color.
- Visit a local farm to look for insects and other animals using protective coloration; help pick off some “pest” species like cabbage worms on kale and other brassicas.
- Create “camouflaged” meals using ingredients with similar color scheme and texture (salads with other green or red-purple vegetables, red lentil soup with tomatoes, rigatoni pasta with chickpeas that become hidden inside).

Forest Days/Outdoor Learning

- Look outside for evidence of animals using protective coloration; record different types of camouflage or other methods of protection.
- Model the importance of blending in with a specific habitat- hide from each other while wearing regular clothes and then while wearing protective camouflage (sheets, scarves, burlap) that matches surrounding area.
- Design a creature out of natural materials so that it blends in with its surroundings; try to find each others’ creations.

Frogs and Toads

Students will: sequence the life cycle of three common species of amphibians; compare species of frogs by viewing photos, listening to their calls, and noting each species' key distinguishing features; create a visual and audio field guide to identify common frogs; carry out a field investigation of frogs and other amphibians at a local pond or wetland, using key field marks to identify; and recognize and imitate five different frog species' courtship calls.

Farm to School

- Visit nearby pond, wetland, or woodland to look for frogs, toads, and salamanders.
- Investigate the impact of amphibians on a garden (controlling insect populations, for example).
- Create amphibian habitat in school garden with shady plants, overhanging rocks, and small pools of water.

Forest Days/Outdoor Learning

- Model the life cycle of a frog, toad, or other amphibian and experience their movement during different life stages.
- Explore a nearby pond or wetland for evidence of amphibians and record observations in nature journal.
- Sit quietly to listen for frog calls; try to identify species and imitate calls.

Ferns and Fiddleheads

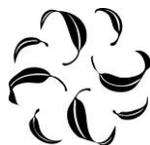
Students will: learn the parts of a fern and sort ferns into three basic groups by leaf form; construct a large model of a thrice-cut fern; conduct a fern survey outside, looking for different kinds of ferns and stages in their life cycles; closely examine and record observations of a fern or fiddlehead; make prints of fern fronds; and model the unfurling of a fern frond.

Farm to School

- Look for ferns in and around the school gardens and make observations about leaf form, life stage, stalk texture, and color; note similarities and differences between ferns and garden plants.
- Compare the unfurling of a fiddlehead to the sprouting of a seed.
- Examine the differences between seeds and spores.
- Forage for ferns- **correctly identify** and responsibly collect ostrich fern fiddleheads to prepare and eat.

Forest Days/Outdoor Learning

- Model the unfurling of a fern frond, crouching low to the ground as a fiddlehead and slowly growing upward into a fern.
- Explore ferns outside, making observations about their structure and identifying whether they are once, twice, or thrice-cut.
- Draw a picture of your favorite fern in nature journal; label different parts and their functions.
- Model fern reproduction through spores and rhizomes.
- Look for ferns ready to release spores- give them a shake and release spores to the wind.



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