



Four Winds Nature Institute
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CYCLES IN NATURE

A butterfly emerges from its pupa case, drinks the sweet nectar of flowers, finds a mate, lays eggs and dies; the next generation will soon hatch to begin the cycle again. A tree stands bare of leaves as winter's snows fall, but the warmth of spring's sunlight finally encourages the buds to open. The cycles of living organisms reflect the seasonal cycles of their environment, and we find that these often overlap in a complex web – springtime brings warm rains, seeds sprout and leaves unfurl, insects emerge and eat young leaves, birds migrate northward to dine on emerging insects. These events repeat year after year in a cycle of ongoing change. Throughout this yearlong theme, students will examine the characteristics of organisms, paying particular attention to life and seasonal cycles.

Vermont Standards: Inquiry 7.1, The Living World 7.13, Universe, Earth and the Environment 7.15, Listening 1.13, Questioning 2.1, Sustainability 3.9, Understanding Place 4.6

New Hampshire Standards: Science Process Skills *SPS1, SPS3, SPS4*, Life Science *LS1, LS2, LS3*

September

INSECT LIFE CYCLES: Egg, nymph, larva, pupa! Different insects go through different stages as they grow from egg to adult. The process of metamorphosis and the timing of the changes play a big role in the success of this class of animals. We'll have a chance to observe a variety of different insects and look for examples of all stages of insect life.

October

TREE GROWTH: Most of us have a favorite tree, and we watch it as it changes through the seasons and grows through the years. But what makes a tree a tree? We'll look at the different parts of a tree and how these work together to produce energy for growth, move water from root to twig, make new rings of wood. We'll also see how a tree changes through the seasons. If you could interview your favorite tree, what questions would you ask it?

November

TRAVELING SEEDS: Whenever you come home from a walk with burs on your socks or pop a jewelweed pod, you are playing a part in the dispersal of seeds. After a plant flowers and produces fertile seeds, those seeds must still find a spot to grow. We'll see what the inside of a seed looks like, how it holds all that is necessary for a new plant to grow, and explore outside to see the many different ways seeds move from place to place.

January

BIRDS ON THE WING: As winter approaches, we see different birds at our feeders and miss some of our favorite songsters in our woods. Some birds migrate hundreds of miles to find the food and shelter they need, but other birds stay right here through the cold months. We'll look at the challenges birds face if they leave for the winter and how they cope if they stay here.

February

TREES IN WINTER: Winter trees may look dead, but they are very much alive; and, as spring approaches, we can see the signs of renewed growth. The buds start to expand, the leaves and flowers emerge, and though we can't see it happening, the tree is adding a new ring of wood to its branches and trunk. We can track the history of a tree's growth when we examine a tree slice, counting the rings and looking for differences in the rings that can tell us about the conditions of that year's growing season. See how many different kinds of winter trees you can identify in your own schoolyard. In the springtime, you can look again and match leaf to tree.

March

GALLS GALORE: You see these lumps and bumps on plants of many different varieties. What are they? A gall is an abnormal growth created on specific kinds of plants that is produced by some external stimulus. Insects can induce gall growth, and these galls provide food and shelter for the young insect. We'll compare a variety of galls and learn about their development. Imagine what it would be like to spend your life inside a plant stem! You'll be surprised how many galls you can find in your own schoolyard.

April

SONGBIRD SONGS: Cheerio cheery me, Cheerio cheerily. The wonderful sound of robins singing tells us all that springtime has arrived and the migrant birds have returned. Songbirds sing to attract mates and to establish and defend territories. It's fun to listen to the birds singing in the schoolyard and learn to identify some of the songsters in your neighborhood.

May

DANDELION CYCLES: Their yellow heads brighten a green lawn, to the delight of many and the dismay of others. These hardy flowers have a host of adaptations that allow them to survive in the toughest of conditions. We'll look at the different stages of seed development by dissecting a dandelion head and then head outside to find plenty of examples of these flowers in all stages of development. Go ahead, blow those fluffy white seeds and see how far it travels in the wind.