TEACHING TIPS
Winter Survival Reconnaisance Hike

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How often our perceptions of winter are influenced by human concerns and needs. Snow blowers, antifreeze, firewood, insulation, and ski-wear as comfortable, economical, and enjoyable as possible. We frequently get so caught up in our own personal response to winter, that we fail to take note of how other life forms survive that do not have the benefit of our "creature comforts."

To many plants and animals in the natural world, the season of winter can be a time of dormancy, rest, rejuvenation, or simple energy economy; for others, winter may inflict its harshness in the form of weakened resistance, selective culling, or even death.

Since our environmental field center is located in a large State Forest, it is possible to lead groups on winter reconnaisance hikes where firsthand observations of animal and vegetational responses to winter may be observed. Following a brief introduction to winter and its causes, student members of the "Winter Reconnaisance Team" are given separate task cards that *each* define a form of plant or animal response to winter. On each card is an "example" illustration of a plant or animal which exhibits that particular winter response, along with a brief description of the response itself. Each student is then instructed to discover and help located other examples of that *same type of plant or animal response* during the ensuing hike through the woods.

The typical winter responses observed fall into two major categories:

Vegetational Responses	**Animal Responses**
Overwinters in seed stage	Migrates
Only root system survives	Overwinters in egg/larva/ stage
Retains woody tissue	Goes into dormancy
Retains green leaves	Goes into hibernation
Retains dead leaves	Remains active
Dies	Death/reduction of numbers

During the hike, as each student discovers an example of his type of winter response, he calls his discovery to the attention of the rest of the group. The instructor then generates discussion about the winter response discovered and encourages the student to record appropriate notes about it on a slip of note paper attached to the back of his task card. At the conclusion of the hike, the various plant/animal winter responses are reviewed using the notes of the student observers. Animal picture flash cards may be used to reinforce images of those animals whose presence may only be detected by *evidence* (i.e., burrows, dens, feathers, fur droppings, tracks, etc.).

One such reconnaisance hike in our forest revealed the following forms of winter responses: overwintering of a wasp in a goldenrod stem gall; winter food "cache" of the beaver; insulated leaf nest of the gray squirrel; winter survival of a fern root system; downward soil migration of earthworms; leaf-rolling tendencies of rhododendron shrubs; seed dispersal of a thistle plant; owl roost in the protective canopy of an evergreen tree; snow "tunnels" of meadow voles; migration of the Canada goose; alteration of winter diet of the cottontail rabbit; retention of dead, protective leaves of an American beech tree; and the winter starvation of a white-tailed deer.

Through this type of field discovery - and - review process, students may come to better appreciate that plant and animal responses to winter are energy-efficient and have been gradually and selectively evolved as a matter of SURVIVAL: those species that have evolved the most efficient and reliable methods of overwintering and conserving heat-energy are those that survive best. Students also learn that, although most human responses to winter are *behavioral* (wearing warmer clothes, turning up the thermostat, winterizing homes, etc.), most responses in the natural world are complex associations of *anatomical* and *physiological* factors, as well. For example, many mammals develop thickened layers of fur and body fat in winter and make internal adaptations to accommodate altered winter diets.

At the conclusion of this session, students are challenged to consider the environmental implications of our human responses to winter (as compared to those of the natural world). For example:

1. What **appetite** for non-renewable energy resources does our human demand for winter warmth create?
2. What affect does the combustion of winter fuel resources have on the **quality** of air in our atmosphere?
3. What influence do certain "winterizing" substances have on the **condition and quality** of our environment in general: i.e., discarded antifreeze, certain types of insulating materials, excessive use of road salt, etc.?
4. What **inefficiencies and excesses** in energy use and consumption do we encourage through various "leisure and luxury comforts" in winter (fireplace fires, hot-tubs, snowmobiles, warm-up of internal-combustion engines, etc)?

From this discussion, students can see that, compared to plants and animals in the natural world, our human response to winter is quite different. Though none of us can respond to winter exactly like plants and animals in the natural world, perhaps there are some ways that we can emulate their responses to become more energy-efficient and improve the overall quality of our environment.