

## WVMN Class Description

<b>Title:</b>	<b>NATURE IN WINTER</b>
<b>Objectives:</b>	Explore the ways plants and animals adapt to the special conditions caused by prolonged winter cold.
<b>Class type:</b>	Elective
<b>Time:</b>	1-3 hours
<b>Optimal season:</b>	Winter
<b>Materials:</b>	No special materials needed.
<b>Expected outcomes:</b>	The student will gain a basic understanding of <ol style="list-style-type: none"><li>1. what causes the winter season and how its intensity varies with latitude and elevation.</li><li>2. the main problems that winter cold presents to plants and animals.</li><li>3. a variety of strategies used by organisms to overcome these problems, including hibernation, migration, and storage of food (animals) and dropping of leaves or overwintering as seed or underground (plants).</li><li>4. the advantages to some plant species of decreased competition for light in winter and early spring, including forest-floor evergreen species, spring ephemeral herbs, winter annuals.</li><li>5. ideas for wintertime nature study.</li></ol>

### WVMN Class Outline

1. Winter, season of cold and short days
  - a. What causes winter (tilted earth means diminished sunlight)
  - b. Winter, elevation, and latitude
  - c. Winter and erosion
  - d. Problems winter presents for living things
    - Desiccation (ice is not available to plants and animals)
    - Freezing (ice crystals in cells cause fatal physical damage)
    - Diminished food supply
    - Diminished oxygen in ponds (ice cuts off air, snow cover prevents oxygenating photosynthesis in aquatic plants)
2. Adaptations of plants to winter
  - a. Deciduous trees (both leaves and sap fall)
  - b. Increased light on deciduous forest floor (evergreen herbs and spring ephemerals)
  - c. Resisting drying (e.g., curling of Rhododendron leaves)
  - d. Overwintering as seeds, underground parts, winter annuals, woody stems)
3. Adaptations of animals to winter
  - a. Hibernation and less profound states of torpor
  - b. Hoarding food
  - c. Migration (sometimes combined with hibernation, e.g. bats and monarch butterflies)
  - d. Insulated nests, thicker fur, huddling together
  - e. Change of diet
  - f. Change of color in a white and brown world (e.g., snowshoe hare)
  - g. Mixed foraging flocks of birds
4. The naturalist in winter things to observe and things to do (e.g., bird nests, animal tracks and signs, woody plants, terrestrial invertebrates, etc.)