The following activities focus on investigating local ecosystems, whether in the schoolyard or further afield. The ideas are presented in four grade level categories, but many can be adapted to several levels.

Grades K-3

Math
Landscape Tally: Take a walk to look for different colors, shapes, or objects. Have students keep a tally and make simple graphs to represent the numbers in the various categories. How would you describe your area to someone from another city or country?

Classification: Have students collect 20 or more leaves and sort them by color, shape, etc. Discuss how different classification criteria lead to different distributions. What are some of the criteria we use to classify groups of organisms such as mammals, birds, plants, and insects? How might our ordering change if we used different criteria?

Science
Wild Groceries: Discuss the position of items in a grocery store: some are on the top shelf, some are on the floor, some are stored in the basement. Have students look at the outside environment as a grocery store. What types of food are located on the top shelf (canopy), lower shelf (understory), bottom shelf (ground), and basement (underground). From what shelves do different animals “shop”? Do most animals “shop” from the same shelf, or are they evenly distributed?

Animal Tracks: Look for animal tracks in mud, sand or snow. Have students try to move their bodies in such a way as to leave track patterns similar to those they have seen. How difficult is it to move like other animals? Do you think rabbits, deer or mice would have problems walking like us? How does this relate to the concept of adaptation?

Art
Nature Crayons: Have students collect materials such as leaves, twigs, dirt, and berries, and rub them on a piece of paper to determine what color, if any, their “nature crayon” has. Have them draw a picture using these natural colors. (Caution them not to use items such as poison ivy, nettles, or live insects.)

Eyes: Have students “try on” the eyes of other animals. To simulate having an eye on the top of your head, hold a small mirror face up and level and look straight into it. Try walking a few yards with this view. For an eye on the side of the head, hold
the mirror perpendicular to the ground and facing to the side. How do these views of the world differ from our own? Why do you suppose some animals have eyes in different places? What role does seeing things in different ways play in art?

**Social Studies**

**Landscape Changes:** Obtain journals of early settlers in your area and read aloud their descriptions of the landscape. Take a walk outside and make notes on how the landscape has changed since the settlers’ time. How is it the same? If you, as a class, wrote a description of your landscape, what would it be? Read *Dandelions* by Eve Bunting and talk about the challenges and changes in landscape that the characters experience.

**Language Arts**

**ABC Hike:** Walk around outside looking for things that begin with the letters of the alphabet. As you come across an ant, have the students either write about or draw a picture of the ant under the letter A. See how many letters of the alphabet you can cover.

**Grades 4-6**

**Math and Art**

**Signature Trees:** Identify a signature tree that is representative of the trees in your area. Every year, have students measure the circumference of the trunk at chest height and determine its diameter, the diameter of the canopy, and the height of the tree. Measure the length and width of randomly selected leaves and determine average size. Compare the data from year to year. What patterns of growth do you see? Each year, take photographs of students standing next to the tree and have students draw pictures of the tree from a variety of angles. Label these carefully and save them in your schoolyard archive. Have students observe changes by comparing their photos and finished drawings with those from past years.

**Science**

**Animal Communities:** Explore animal communities that might make their home in or around the signature tree. What evidence do you see of them? What role does this tree play in the life of the woodland?

**Fall Colors:** As the leaves begin to change color, pull off a leaf every day and record the date. Dry the leaves in a press and laminate them on a poster with their dates. Explore pigmentation and find out the reason leaves change color.

**Language Arts**

**Tree Tales:** Have small groups of students sit silently for a short period of time next to a tree. What sounds can be heard? Where do they come from? If the tree could talk, what stories could it tell? Write a haiku, cinquain, or other poem about the tree. Read *My Side of the Mountain* by Jean Craighead George about a boy who spends a year in the woods making his home inside a carved-out hemlock tree. Write a sequel set in the school nature area.

**Social Studies**

**Prairie Changes:** Explore the role of the prairie in the lives of Native people. How did it change as the Europeans moved in? How did their attitude toward the prairies differ? Let students sit quietly in the prairie and imagine what life was like. What is the future of prairies in North America? (This can be adapted for other ecosystems.)
Grades 7-8

Art

Nature in Art: Look at illustrations and paintings of landscapes and natural objects such as leaves, shells, twigs, and stones. What is the artist trying to communicate — a feeling, an impression, a detail, or technical information? What are some different ways that artists might represent the same object? Have students pick an item or a feature (a tree, a twig, dry grass) and represent it in different ways, perhaps focusing on line, color or “impression” one day, and on accurate proportions and specific details on another. What are the advantages of each?

Social Studies

Medicinal Herbs: Research plants that were used by Native people and early European settlers as medicinal herbs. Collaborate with a local naturalist to determine if any of these plants grows locally. Are they native or were they brought to North America by European settlers? Are any still in use? (Examples: coneflower, golden seal, ginseng, chamomile, peppermint.) Conduct a field trip to point out local medicinal herbs and try some herbal teas made from them. Plan a garden of native medicinal herbs for your school ground. Useful references: Kelly Kindscher Medicinal Wild Plants of the Prairie (University of Kansas Press, 1992); Laura C. Martin, Wildflower Folklore (Globe Pequot Press, 1984).

Science

Seed Strategies: In autumn, collect dry seed heads from wildflowers and have students draw, dissect, and analyze them with the following questions in mind: In which part of the seed head are the seeds? Do some appear to be more ripe than others? What strategy does the plant use to distribute its seed? Are all the seeds released at once, or a few at a time? Does seed distribution depend on animals, wind, or something else? How do the characteristics of the seed increase its chances of finding a good place to grow? How are dry seeds different from seeds in fleshy fruits? What is the function of the fleshy fruit?

Sowing Wild Seeds: Try germinating wildflower seeds by rolling them in a moist paper towel and putting the towel in a plastic bag. Keep the bag in a warm place for a week or two. How are wild seeds different from seeds we buy? Do germination rates differ between species? Have students research seed dormancy. What purpose does dormancy serve?

Language Arts

No Uncertain Terms: Investigate the need for specialized terminology. In autumn, collect several different kinds of grasses, including seed heads. Have students describe the grasses in detail without using any specialized terms. Post all the descriptions of each species together. How much alike are they? How long are they? Could you be sure which grass was being described?

Teach a short lesson on grass terminology, including terms such as blade, sheath, node, inflorescence, and spikelet. Have students describe the grasses again, using the new terms they have learned. Compare the descriptions. How similar are the descriptions now? How long are they? What conclusions can we draw about specialized terms? When is it beneficial to use them, and when does using them interfere with communication? (This activity could also be done with dry seed heads.) Reference: Lauren Brown, Grasses: An Identification Guide (Houghton-Mifflin, 1979).
Grades 9-12

Language Arts

Life Like a River: Discuss the concept of watersheds and the idea that rivers and lakes develop characteristics which reflect the journeys of the water flowing into them. Extend this to consider the concept of cultural watersheds. How did people flow to this place? What experiences did they have in getting here? How does the community reflect the characteristics of the people living there? Visit a river or stream and compare in writing the role and growth of the river with your own. Begin with questions such as: How old is the river? What are the signs of its age? How is it viewed? Who depends upon it? Compare/contrast what you have observed about the river with your own growth and responsibilities. At this point in your life, how are you viewed? What are your responsibilities? Who depends on you?

Science

Foot Loading: The ability to travel through snow to obtain food and shelter is crucial to many animals. It is influenced by the physical characteristics of both the snow and the animals’ feet and legs. Heavier animals generally have larger feet and longer legs than lighter animals. One way to study how different animals move through snow is to compare foot loads, or an animal’s mass per unit foot area. To compare foot loads, the following foot load index is used: 100 minus (body mass in grams/foot area in cm²)/10.

Have students calculate their body mass in kilograms and their foot area in centimeters. Then go outside and measure foot penetration in undisturbed and packed snow. Construct a graph showing the relationship between foot load indexes and foot penetration. Calculate the foot load index of a pet cat or dog and compare. Look for and identify tracks in snow and discuss the implications of foot size for animals living in snowy environments.

Math

Weighty Water: Measure how much water comes down when it rains. First, calculate the area of the schoolyard. Measure the next rainfall and calculate the volume of water that fell on the school grounds (depth x area). Compare this volume to quantities the students would recognize. For added effect have the students calculate the weight of this water (1 cubic foot weighs 28.4 kg or 62.5 lbs; 1 cubic meter weighs 1000 kg or 2205 lbs.). Discuss where all this water goes.

Personal and Family Life

Animal Clans: Throughout history cultures have used clan animals to create or express a closeness to the natural world. Ask students to list the living things that inhabit your nature area (whether observed or not) and discuss the characteristics of a few of the species. Tell the students they will be forming “clans” and selecting a plant or animal that best represents their traits. Each group should research several species, select one that is representative of their group, and list qualities of their clan species that they find inspiring and want to foster in their own lives. Create visual displays that highlight these traits and introduce the clan to the rest of the class.

Activities developed by members of the School Nature Area Project in Northfield, Minnesota: Nalani McCutcheon (K-3), Bill Lindquist (4-6), Char Bezanson (7-8), and Craig Johnson (9-12).