

# Life-Cycles & Families: Water and Land Animals

Grade: Every grade

Group Size: One Class

Time: 1 ½ Hours

Season: Spring

**\*Adapted from Prairie Wetlands Learning Center**

## **Summary:**

During an investigation, students make predictions as well as ask and answer their own questions about animal families and lifecycles. They search for animals in the prairie and a wetland to observe parents and offspring. Using a checklist, they track which parents and which offspring they find. Back inside, students compare their results to their predictions and share other discoveries.

## **Performance Objectives:**

After completing this activity, students will be able to...

- Identify and match two parents with their offspring.
- Give an example of offspring and parents that look similar to each other and that look different from each other.
- Recognize that not all life cycle stages look like the adult.
- Enjoy exploring the oak savanna/prairie and wetlands and observing animal families.

## **Core Standards:**

Science: The Nature of Science and Engineering

- The Practice of Science
- Interactions Among Science, Technology, Engineering, Mathematics and Society
- Communicate Investigations and Explanations.

Science: Life Science

- Structure and Function in Living Systems
- Evolution in Living Systems

Literacy: Speaking and Listening

- Informational Text
- Foundational Skills
- Speaking, Viewing, Listening, and Media Literacy
- Language

## **Materials Needed:**

- Clip boards
- Lifecycle photo sets
- Pond nets and tubs
- Journal Sheet

### **Background Information:**

The purpose of this program is to introduce students to animal families and give them an enjoyable first-hand experience searching for and watching oak savanna/prairie and wetlands animals. Using the KWL model, students design an investigation based upon their own questions about animal families. Their field work helps answer those questions and allows for additional discovery.

Members of animal families may include parents, offspring, siblings, and other relatives. Animal families are part of the elaborate realm of animal behavior. "All species of animals have intricate and purposeful patterns of behavior. Some behaviors are learned while others are inherited. ... Animal behavior refers to the way in which an animal responds to its environment. The behavior takes many forms including communication, courtship, caring for young, territorial disputes, finding and consuming food, and for some species, migration or hibernation."

*(Wildlife Forever)* Many offspring are not parented but are genetically programmed for survival, such as insects, reptiles, and amphibians. Offspring living in the family social unit, such as mammals and birds, learn many of their behaviors from siblings, parents, and/or relatives.

Among most animals, it is the mother who typically cares for the young.

- Female birds incubate the clutch of eggs and warm the brood after hatching. Some mother birds provide more care than others, depending upon the type of bird. Precocial birds like prairie chickens and waterfowl, for example, hatch with eyes open and with downy feathers. They can walk, run, and feed themselves right away. Altricial species like bobolinks and red-winged blackbirds, however, hatch with eyes closed and without feathers. They cannot walk or run yet. Their parents must provide food in order for their offspring to survive. Both Canada goose parents care for the young. The father's role in this case is to watch for and alert the family to danger, defend the territory, and protect the family from harm.
- Adult females are usually the primary care provider amongst mammals as well. Raccoons are ready to leave their tree den to explore at about 10 weeks of age and are fully independent at four to six months of age. Gray squirrels and striped skunks wean at about two months of age but stay with their mother for two more months. The young of cottontails, muskrats, and meadow mice leave their mother at about four weeks of age. Both coyote parents help raise their young by regurgitating food for them to eat, and the pups are independent of their parents by six to nine months of age. Mammal families remain intact for varying periods of time depending upon the species.

During their spring visit, students are encouraged to notice if parents and offspring look alike or completely different. For example...

- Parents and offspring of aquatic mammals like mink and muskrats look nearly identical except for differences in size. Prairie mammal parents and offspring also look similar, such as 13-lined ground squirrels and plains pocket gophers, especially the older the offspring become.
- Offspring of ducks and geese are the same shape but different sizes. Both parents and offspring have feathers, swim, and search for food. They are less identical looking than aquatic mammals but more so than some insects.
- Also, parents and offspring of insects which undergo simple metamorphosis (grasshoppers for instance) look nearly identical except for differences in size. They begin life as an egg. The nymph hatches from the egg and looks like a miniature adult. The nymph sheds its skin several times to accommodate the growth and development of its body until it reaches adult size and maturity.
- However, parents and offspring of insects that undergo complete metamorphosis (butterflies) look entirely different from each other. These insects also start life as an egg from which the larva (caterpillar) emerges, grows, and sheds its skin several times. The caterpillar makes a chrysalis within which the pupa transforms into the adult form and emerges. Dragonflies lay their eggs in water, wetland soil, or in aquatic plants. The eggs hatch and the larvae live in the water as predators. They leave the water to metamorphose into adults that fly in the air over both prairie and wetland habitats defending a territory, hunting, and mating. Adult females return to wetlands to mate and lay their eggs, possibly with males protecting them, and the cycle begins anew.

- Leopard frogs lay globular masses of black eggs in shallow water. The eggs hatch and tadpoles emerge, living in the water as omnivores and breathing dissolved oxygen with gills. They develop legs and lungs to breathe atmospheric oxygen, and then leave the water to live on land as predators, especially in wet meadows and tallgrass prairies near ponds and lakes. They prefer grasses six to 12 inches tall to allow cover for hiding but short enough to allow adequate movement. Leopard frogs over-winter on the bottom of deep ponds, lakes, and streams. By the spring thaw, they are moving overland to breeding ponds, and the cycle begins anew.
- Painted turtles and snapping turtles spend most of their life foraging for food and finding shelter in ponds. However, females move away from the pond into the prairie to dig a nest and lay their eggs. The eggs may hatch that same year with the young turtles emerging from the nest right away. Or if the eggs are laid late in the season, the hatched young will over-winter in the nest, emerging in spring. Young turtles travel overland to a pond to feed, find shelter, and mature.
- Mallards build nests in prairie associated with small ponds where they are better protected from predators by upland grass cover. After their eggs hatch, hens move their broods to the ponds to feed. As the season progresses to hotter, drier weather and small ponds dry up, hens move their broods to deeper wetlands to feed. Once ducklings grow flight feathers and adults complete their annual feather molt, they can fly to upland fields to feed on waste grain, to upland grasses for cover and loafing, and to other wetlands to feed and loaf (including during fall migration and at wintering areas). In spring mallards return and the cycle begins anew.

In addition, the chart below lists other animals by habitat as well as the name used for their young.

<b>Habitat</b>	<b>Animal</b>	<b>Offspring Names (Life Cycle)</b>
Prairie/Oak Savanna	Killdeer and sparrows	Egg, hatchling, chick, fledgling, juvenile, brood
	13-lined ground squirrels	Pup
	Grasshoppers and crickets	Egg in egg pods, nymph
	Millipedes	Egg, larva/nymphs
	Ladybugs and ants	Egg, larva, pupa
	Butterfly	Egg, caterpillar, pupa, adult
Wetland	Red-winged blackbirds	Egg, hatchling, chick/nestling, fledgling, juvenile
	Snails	Egg, hatchling
	Mallards	Egg, duckling, brood, fledgling, juvenile
	Muskrats	Kit
	Turtles	Egg, hatchling
	Frogs and Toads	Frog spawn, egg, tadpole, polliwog, froglet, adult
	Trumpeter Swans	Egg, hatchling/cygnets, fledgling, brood
	Canada Geese	Egg, hatchling, gosling, juvenile, fledgling, brood
	Bald Eagles	Egg, hatchling, nestling/eyas/hawkling, fledgling, juvenile, brood

As spring continues and summer begins, wetlands offer a buffet of aquatic invertebrates that waterfowl consume to refuel their energy reserves during migration, produce eggs, and fuel rapid growth of their offspring. Grasslands and woodlands provide nesting habitat for various species including blue-winged teal, mallards, and wood ducks. This blend of habitats provides for an impressive diversity.

## **Procedure:**

1. **Refuge Volunteer:** In the classroom, welcome students, teachers, and chaperones to Sherburne National Wildlife Refuge. Remind them of your name. Explain traits of a naturalist and expectations for behavior: calm and quiet, inquisitive, respectful, prepared, use all of their senses.

2. **Teacher:** Explain to students that today they are going to be doing an investigation of animal families and lifecycles. Ask them to tell you some things that they already know about animal families. (This is the K part of the KWL model; what do students already know?) Have they seen any animal families before? How about goose or duck families? Which members of those families did they see? Are there other animal families in the prairie, savanna, or wetlands?

3. **Teacher, with assistance from volunteer:** Ask students what they would like to find out about animal families when they go outside in the prairie/oak savanna and in a wetland? Jot down their questions on the white board or a clipboard. (This is the W part of the KWL model; what do students wonder or want to find out?) Ask the class what kinds of animal families they think they might see? Which ones might they see the most or least? Write down their predictions on the clipboard.

4. **Volunteer:** Explain that soon the class will be splitting into groups and heading outside to explore and try to answer our questions and test our predictions. Depending on time available, some groups will make observations in the prairie/oak savanna habitat while others make observations at the wetland habitat. Afterward, groups will compare observations. If ample time available, each group can explore both habitats.

5. **Volunteer, with assistance from teacher:** Tell students that they are now almost ready to go outside to explore. Put students into small groups, and put an adult volunteer with each group, if possible. Make eye contact with the adult volunteers and teachers. Explain to them that they will each get a small group of students. When the class gets outside, some groups will head to the prairie/oak savanna and others to the wetland.

8. **Volunteer:** Distribute materials to each volunteer leader. Have all the groups form a single file line to get ready to head outside. Make sure that the students have all of their materials. Remind students that naturalists are happy outside, explorers, adventurers, respectful, prepared, responsible, and quiet. They ask questions, use words, numbers, and pictures, and share their discoveries.

### 9. **Volunteer and Teacher:**

In each habitat, look and listen carefully for animals.

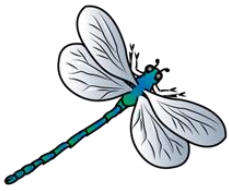
- Look in soil, muck, and water for invertebrates. Use tubs and nets to collect and examine aquatic invertebrates. [Option to bring tubs of invertebrates to the classroom for examination.]
- Watch the water, grasses, and sky for perching, singing, and flying birds and flying and skating insects.
- Search grasses for insects and other invertebrates on leaves and stems.
- Check the water surface for a swimming muskrat or turtle.
- Listen for singing frogs near the wetland and insects in the prairie.
- In the prairie, look for ant mounds or rodent holes.
- In the savanna, look for squirrel nests or bird nests/cavities.

When animals are observed, prompt students with questions as appropriate to encourage thinking and discussion.

- Which family member are they observing? (parent or offspring)
- What stage of life are they observing? (For example, egg, larva/caterpillar, pupa/chrysalis, or adult butterfly?)
- Do the parents and offspring look the same or different? In what ways?
- Do the parents raise their young or not? How can they tell?

12. **Volunteer and Teacher:** To wrap-up, sit together as a whole class back inside and ask the class to share what they discovered outside. When you ask them, “how do you know?” encourage them to answer based upon their observations. Answer the questions that students generated as recorded previously. (This is the L part of the KWL model; what have we learned?) Review the kinds and numbers of different animals and families observed as recorded on their checklists and compare to their predictions. How do they think animal families might be important?







13. **Volunteer:** At the end of the lesson, explain to students that today they discovered how magical the prairie/oak savanna and wetlands can truly be if they just look closely. There are endless discoveries to be made about different habitats. Students don’t even have to come to Sherburne NWR to track changes in animal families; they can do it in their very own yard, at a park, or anywhere outside. Explain that the world needs more naturalists who will stop to examine the beauty of different habitats and that, because they did such a good job today, they seem like perfect candidates.



# Animal Families at Sherburne NWR



Names: \_\_\_\_\_ Date: \_\_\_\_\_

Animal	Mom	Dad	Parent	Baby
Canada Goose 				
Duck 				
Red-winged blackbird 				
Ant 				
Dragonfly 				
Frog 				
<b>And More! (List)</b>				