

# Birds of Vermont Museum



## School Scavenger Hunt V

Name \_\_\_\_\_

Grade \_\_\_\_\_

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### FIRST FLOOR

#### Wetland Dioramas:

The larger diorama depicts a spring scene with the birds in their spring plumage. The smaller one shows a fall scene and birds in their fall plumage. Some of the birds can be found in Vermont all year, some migrate through Vermont, and some come to breed and nest.

*S9-12:39 Evolution and Natural Selection*

1. Notice the species' range maps alongside each bird's information card and consider the wintering and breeding sites for the various water fowl and birds.

a) Some wetland birds migrate along the coastline. Why might this be an advantage?

b) Name two wetland bird species with a broad migratory range.

c) Name two wetland bird species with a narrow migratory range.

d) What might dictate the boundaries of these ranges, and might these boundaries change over time or remain fairly permanent? Explain.

*S7-8:39, S9-1:39 Evolution and Natural Selection*

2. The American Bittern (#8) displays an elongated, up-stretched neck within a stand of bulrushes. What might be the purpose of this action and how does the Bittern's plumage color and body movement enhance the effect?

3 a) In what ways might this wetland environment meet the needs of all the birds represented here?

b) Consider which adaptations enable the birds portrayed in this particular freshwater/ marshland/ meadow habitat to survive. (Think about physical features as well as behaviors). Below, identify one of the birds from 1b) and 1c), and describe/explain three adaptations which support its survival.

i.

ii.

iii.

4. The Common Tern (#27) is endangered in Vermont . Examine the causes of diminished tern numbers. This species' recovery effort is currently being coordinated by Audubon Vermont and Vermont Fish and Wildlife. Fill in the graph showing the recovery progress.

*Expand:* Student groups research efforts to address each concern and discuss which approaches may be proving effective over the last forty years, and why.



**Endangered and Extinct Birds of North America:**

*S9-12 Classification of Organisms*

5. Notice the prehistoric Archaeopteryx, a bird whose fossil evidence suggests a connection to reptilian species. Compare a lizard's characteristics with those of the Archaeopteryx.

6. Explain why the Rainforest is a vitally important natural resource for North American birds. Provide specific examples to support your response.

*S9-12:39 Evolution and Natural Selection; S9-12: Equilibrium in an Ecosystem*

7. Of the birds portrayed in the Endangered and Extinct Birds exhibit, what environmental threats and human activities have figured in jeopardizing their survival? List four.

8. How have humans intervened to reverse the decline in population numbers for the California Condor and Whooping Crane?

**Viewing Window:**

*S9-12:38 Classification of Organisms; S9-12:5 Represent Data*

9. Using the resources available, list the names of a few of the birds you see in the feeding area. Are other animals present? If so, which?

10. What behavioral or auditory observations can you make about individual birds and their interactions with others present?

11. Are male and female birds of a particular species present? How are they alike? How are they different?

*S9-12:2 Predicting and Hypothesizing*

12. In a basket by the window is a set of labeled beanbags indicating the weights of different bird species represented by these bags.

a) Estimate the weight of one bird you see at the feeders. Check your guess with the bean bag version; then, compare a variety of birds' weights. What physical structures factor into a bird's overall weight?

b) Might a correlation between size and weight be suggested by your findings? If so, what?

## SECOND FLOOR

### **Raptor Gallery:**

*S9-12:38 Classification of Organisms; S9-12:39 Evolution and Natural Selection*

In order to survive, these birds of prey must employ adaptations that allow them to hunt with speed and precision.

13. a) List three physical adaptations that enhance a raptor's ability to hunt successfully.

*S9-12:34 Energy Flow in an Ecosystem*

b) At which trophic level would you expect to place raptors? Explain.

14. Many raptor species suffered from humans' use of pesticides, heavy metals, and DDT (which caused egg shell thinning), before their detrimental impacts on organisms were realized. List at least five species affected by these substances:

*S9-12:36 Equilibrium in an Ecosystem; S9-12:2 Predicting and Hypothesizing*

### **Thought Questions:**

Contemporary industrial practices may cause deleterious effects for bird species and nesting populations. Think about incidents such as oil spills, phosphorous run-off into waterways, airborne particulate effluent from paper mills, and other examples of threats to the environment by local industrial contamination.

Focus on a particular problem and predict the outcome from a specific contaminant. Who or what is affected and how? Why might you expect this outcome?

Find articles on the topic with opposing viewpoints. Consider the sources and intended audience. Identify and discuss any bias in the writings.

*Expand:* Create and propose a workable plan for cleaning up the problem as well as controlling or preventing the problem.

Think: can you address all of the connected consequences (good or bad) that must be considered e.g. economics, infrastructure, resources- human and natural, time, etc?

### **Nesting Bird Gallery:**

In addition to showcase displays of nesting birds, you can envision raptors in flight by gazing upward throughout the room. Hawks are readily identifiable by the shape of their tails and the angle of their wings while flying.

*S9-12:38 Classification of Organisms; S9-12:39 Evolution and Natural Selection*

**Winter Diorama:** *(to the right as you enter the Gallery)*

15. Owls are also birds of prey.

a) Look closely at the owls' eye position and the shape of their beaks. How might these features enhance their ability to obtain food?

b) Compare the eye position of owls and raptors with that of songbirds and wetland species. What might be an advantage for songbirds and wetland birds to have their eyes positioned farther apart and to the sides of their heads?

*S9-12: 34 Energy Flow in an Ecosystem*

16. Why do you think the Barn Owl has been referred to as “the most beneficial bird in the world?”

17. Like many owls, the Northern Shrike resides in Vermont in winter and catches other animals for food. Below, describe the prey-gathering technique of this species, nicknamed the “butcher bird.” How might this behavioral adaptation increase the Shrike’s survival potential?

### **Nesting Birds**

*S9-12:39 Evolution and Natural Selection*

18. What is the relationship between Eastern Screech Owls (#F1) and Blind Snakes (a very small snake that resembles an earthworm)?

19. Great Horned Owls (#E1) store mice and other prey during the winter. What behavioral adaptation enables them to consume the frozen carcasses they’ve stored?

Examine the variety of habitats, birds, nests, eggs, and food sources as you explore the displays in the Main Gallery.

20. a) For the following species, identify what the bird eats; what adaptation helps it obtain or consume its food; where the nest is placed; and the materials used in creating the nest.

<b>Case #</b>	<b>Bird</b>	<b>Food</b>	<b>Adaptation</b>	<b>Nest Site</b>	<b>Nest Material</b>
B1	Belted Kingfisher				
B11	Great-Crested Flycatcher				
B12	Marsh Wren				
E5	Hairy Woodpecker				
E15	Eastern Meadowlark				
G7	Red Crossbill				
G10	Northern Parula				

b) How does a bird's nest provide clues to the bird's habitat?

*S9-12:36 Equilibrium in an Ecosystem*

21. a) The Brown-headed Cowbird (#H3) has enjoyed marked success as a species. What particular (and peculiar?) nesting behavior has contributed to this species' survival?

b) How has the Field Sparrow (#E6) overcome the Cowbirds' behavioral habit regarding egg-laying?

22. a) List the names of three introduced (#G1), not native, bird species:

b) Explain the likely consequences of introducing non-native species to an ecosystem.

*S9-12:36 Equilibrium in an Ecosystem*

**Thought Question:**

Consider a specific incidence of locally invasive species such as:

Zebra Mussels or Eurasian Watermilfoil in Lake Champlain;

Purple Loosestrife, Yellow Flag Iris, or Common Reed (*Phragmites australis*) along Vermont's wetlands; or

Japanese Knotweed, Glossy Buckthorn, Emerald Ash Borer, or Hemlock or Spruce Adelgid in woodland areas.

Address the impact of these species as part of the "bigger picture."



## Wrap-Up

*S9-12:34 Energy Flow in an Ecosystem*

23. Draw or describe a food web that includes an individual from the wetlands habitat.

Note: Include and label producers, primary, secondary, and tertiary consumers, and decomposers.

24. Draw or describe a food web that includes an individual from the nesting birds gallery.

Note: Include and label producers, primary, secondary, and tertiary consumers, and decomposers.

### **Thought Question:**

What new technology could be applied to researching land development and agricultural issues, the design and construction of better bird feeders, the design and installation of windows that diminish seasonal bird collisions and death (without sacrificing light and views), or the development of museum exhibits that address certain physical disabilities of visitors and promote accessible learning experiences?

### **Further thinking: Issues and Audubon...**

\*What fashion rage at the turn of the 19th century led to the demise of many birds and the establishment of the Audubon Society?

\*Why might Audubon and the State of Vermont currently advise people to discontinue feeding wild birds between April 1st and Nov.1st?

\*Why then is feeding birds year-round at the Birds of Vermont Museum justified?

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