

Include in this as many of the bird laws as you can.

5. Make two of the following and tell the class how you did it:
 - a. Bird box.
 - b. Bird bath.
 - c. Feeding station.

References:

1. Peabody and Hunt—*Biology and Human Welfare*.
2. Smith—*Everyday Science Projects*.
3. Smallwood, Reveley, and Bailey—*New Biology*.
4. Davenport—*Elements of Zoölogy*.
5. Clement—*Living Things*.
6. Blanchian—*Birds*.
7. Moon—*Biology for Beginners*.
8. *Useful Birds of America*, Series A, one, two, three, four—30 in a set. Sent on request by Church and Dwight Co., Inc., 27 Cedar St., New York, N. Y. (10 cents to cover mailing.)
9. Audubon bird leaflets 5½ by 8½ with four pages of descriptive material. 5 cents each (five cards). National Association of Audubon Societies, 1974 Broadway, New York City.
10. Booklet of sixteen common birds (sent upon request). Dwinell-Wright Co., 311 Summer St., Boston, Mass.
11. Reed—*Bird Guide*.

This assignment was given to an average class of thirty pupils. My first step, after providing each pupil with a copy, was to explain every part of it in detail and to give instructions as to the procedure. This was done on Friday before the Monday on which the work was to be started. Each copy was then collected and held by me until the day of beginning. The pupils were asked to use the week-end for obtaining books and material for work. Books and pamphlets were to be brought in and left on a shelf designated for this purpose. The class as a whole appeared very much interested. On Monday—the day of beginning—quite a good supply of books and some bird charts were brought in. I had outline charts and pictures on the walls of the room also. The room had begun to take on the appearance of a work shop. The papers were given out and work started (of course, certain directions as to mechanical details

were given). Results at the end of the week were as follows:

- 3 pupils completed the A-Assignment
- 6 pupils completed the B-Assignment
- 14 pupils completed the C-Assignment
- 7 pupils completed the D-Assignment
- 0 pupils below the D-Assignment
- 1 pupil started the A-Assignment, but did not finish it.
- 4 pupils started the B-Assignment, but did not finish it.
- 5 pupils started the C-Assignment, but did not finish it.
- 5 pupils visited the zoo in the interest of this work.
- 6 pupils visited the museum.

A large percentage of the class sent for one or more of the pamphlets on birds.

All pupils liked the work and several asked for another unit.

This unit of work was chiefly centered around the plan outlined by Miller and Hargreaves in *The Self-Directed School*. At present I am working on a unit based on "The Group-Study Plan" by Edward R. Maguire.

SADIE S. WILLIAMS.

BIRD STUDY

TO THE close observer, it is evident that in recent years there has been a great increase of interest by people of all ages and all walks of life in the identification and life habits of birds. This is shown by the increased number of adults who have taken up bird study as a hobby and by the large amount of legislation designed to protect birds. Children, too, are changing their attitude from the destructive to the constructive. We do not have to search far nor long to find the reasons for this interest.

Perhaps the basic reason is an economic one. Agriculture has become intensified and new forms of plants have been introduced into our country. With them have come new weeds and insects which, added to those we already had, have complicated

the business of farm production, and, while artificial control has its undoubted value, natural control is the mainstay that has been in operation for all the ages. Birds are, and have ever been, the chief foe of both weeds and insects. A case in point might be cited. An aphid will produce thirteen generations in a single season of at least one hundred young to each generation. It follows, then, that at the end of a single season an aphid could have ten sextillions of progeny in the last generation. If these were put into a single line of ten aphids to the inch, it would take a ray of light traveling at the rate of 186,000 miles a second two thousand and five hundred years to pass from one end of that line to the other. Now if we will pause for the space of time that it takes that ray of light to go one of those 186,000 miles, we will realize that a pair of aphids never have that many descendants in a season. One of the reasons is the appetite of the yellowthroat warble which is known to have eaten 89 aphids in one minute, which is rather discouraging to the multiplying powers of the aphid. In Virginia the bob white alone, destroys, at a conservative estimate, 600 tons of weed seed. Further examples would be in the nature of an anticlimax, and the total economic benefits of birds would be difficult to estimate—and to believe. It is safe to say, however, that birds are the principal item in farm relief.

It is not for their services alone that we care for birds; we love them for themselves. From the time the first robins make us think of separating our spring suits from the moth balls until we hear the southward migrating geese, they are a part of our daily lives. We listen to their songs, and watch them build their nests and feed their young. Even the back seat driver varies the monotony of life by saying "Now, what was that bird?" They are interesting folk. If you note the sad expression on the face of a nestling robin, you may well assume that

it has not had its daily dozen—feet of earthworms. Nests alone are of infinite variety. The tern lays its eggs among the pebbles on the beach, while the Baltimore oriole constructs an intricate affair that it suspends from the twigs of a tree, and is a master weaver. The barn swallow is a mason and builds its home of mud, using its beak for a hod and its breast for a trowel. The cow bird evades maternal responsibility by laying her eggs in the nests of other birds. Incidentally, the cow bird is not the black sheep of the family; it is a black bird. Then there are birds that sing and birds that think they can sing—the thrush and the crow. How like people they are. Feet, bird feet, any kind of feet, are fascinating. Delicate little claws and sinewed talons, scratching feet and great spreading paddles, all tell where they lead their owners. Did you ever see a woodpecker holding on by two toes and rearing back on the other two? Then there are beaks—but space does not allow the taking up of the personality of noses.

The point is that bird study is a human sort of thing and, as such, offers to teachers an excellent opportunity to preface and introduce social studies in the schools. The social life of birds leads logically to the study of the social life of man. Study of the family life of the birds leads easily and naturally to the study of the family life of man and its responsibilities.

Likewise, man's inhumanity to man has much of its origin in man's inhumanity to animal life. Much of human nature is achieved; not all of it is hereditary. The boy that has a warped delight in crippling a bird can easily become the man who can easily take human life, while the boy that loves birds and flowers is more likely to become the one who loves his fellow man. The child may not have the proper human environment to properly develop his moral nature. We may not be able to change that, but we can substitute for the land of the

birds and flowers and dreams and visions. Some one has said that the success and greatness of the English race is due to the fact that every Englishman, no matter how poor, will have a dog. It is something on which to lavish his affection and produces self control, pride of ownership, gentleness, and strength of will. What is true of the dog is true of the horse. It is not so much the question of the kind of animal, but rather that mankind needs association with some kind of animal to make him a better man. Birds too have their humanizing influence.

While the development of morality and a good social adjustment is one of the principal aims of education, acuteness, and accuracy of observation are also very important. Can there be anything better than birds, with their variety of colorings and

markings, their songs, nests, habits, and migrations, lend itself to this end? Try to formulate a description of the wood thrush and the brown thrasher that will actually enable one to distinguish between them, and you will realize your own inability in this respect. In a course in bird study last summer, the students said they had not realized how little they had been seeing before they had started to study birds. When asked at the beginning of the course how many different birds they would expect to see during the next few weeks, the average answer was from twenty to thirty. As a matter of fact they identified during the five weeks no less than ninety different birds. No doubt, several times that many would have been seen if the observations had run throughout the year. These birds are given in the list below:

BIRDS SEEN AT HARRISONBURG FROM JULY 27 TO AUGUST 30

Downy Woodpecker	English Sparrow	Robin
Crow blackbird	Partridge	Ruby-throated humming bird
Killdeer	Yellow warbler	House wren
Wilson warbler	Crow	Yellow-bellied sapsucker
Wilson's thrush	Mocking bird	Black and white warbler
Night hawk	Catbird	Red headed woodpecker
Wood thrush	Mourning dove	Chimney swift
Rusty blackbird	Wood pewee	Barn swallow
Meadow lark	American goldfinch	Chipping sparrow
Yellow-billed cuckoo	Baltimore oriole	Black-capped chickadee
Cardinal	Brewer's blackbird	Brown thrasher
Starling	Black-bill cuckoo	Flicker
Brown creeper	Turkey buzzard	Red-winged blackbird
Screech owl	Pigeon	Field sparrow
Song sparrow	Towhee	Bobolink
Phoebe	Purple martin	Rose-breasted grosbeak
Brewer's sparrow	Vesper sparrow	Cowbird
Bluebird	Scarlet tanager	Yellow-throated vireo
Cooper's hawk	Indigo bunting	Kingbird
Purple grackle	Black tern	Franklin's gull
Ruby-crowned kinglet	Fish hawk	White-breasted nuthatch
Upland plover	Blue heron	White heron
Green Heron	Tufted titmouse	Belted kingfisher
White throated sparrow	Cliff swallow	Swamp sparrow
Blue jay	Spotted sandpiper	Slate colored junco
Tennessee warbler	Orchard oriole	Sparrow hawk
Maryland yellow-throat	Winter wren	Hairy woodpecker
Pine tree warbler	Greater scaup	Loggerhead shrike
Least flycatcher	Warbling vireo	Whip-poor-will
Barn swallow	White swan	Golden-crowned kinglet
American three-toed woodpecker		

Could anyone learn to distinguish all these birds without acquiring accuracy of observation?

Perhaps, after all, the best thing about

bird study is that all children, young and old, like it. It is not like getting vitamins where one has to eat spinach. Anyway, I have never seen a bird eat spinach.

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