



## Displays and Exhibits

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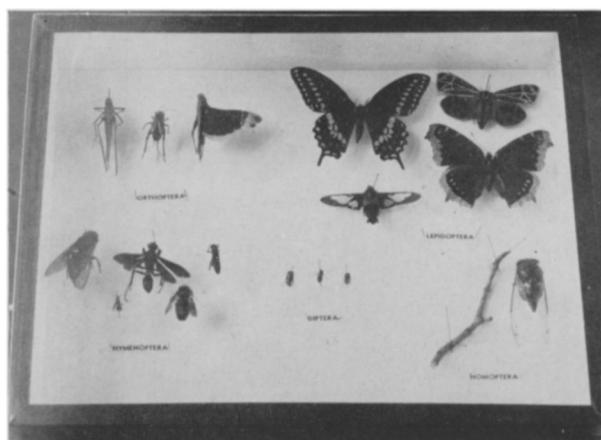
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Many high school biology laboratories are "spic and span," having nice clean work benches, a series of very neat display cabinets under lock and key and a conservatory in an adjoining room filled with plants and aquaria.

A more "biological" atmosphere can be built up by having the aquaria and plants in the laboratory itself where they can be seen and observed daily. Also added interest is secured if displays, pictures, skeletons, specimens, exhibits, and paintings are arranged in the laboratory. Still more interest and more actual learning can be accomplished if the pupils themselves take part in the preparation and placing of these various attractions.

This all gives the impression of having a "work shop" instead of a recitation room.

A display of preserved specimens is a worth-while addition to any biology laboratory, and can be purchased from any science supply house. Fun, valuable experience, and much actual learning can be afforded if the biology pupils themselves make up a display series covering a cross-section of the animal kingdom, and many of the specimens can be procured by the youngsters in one way or another. Glass jars are to be found in any home. They should be of fairly uniform size and shape. Small forms such as insects, spiders, small am-



phibians, etc., can be tied on a piece of glass to keep them up off the bottom of the jar.

For preserving fluid, a 7% formalin and water mixture is good. Insects can be kept in iso-propyl alcohol or even in rubbing alcohol, although the latter is not as good as iso-propyl. A mixture 85 parts of 70% alcohol, 10 parts formalin and 5 parts glacial acetic acid makes an ideal preservative. Most water-inhabiting forms can be anesthetized by adding small amounts of alcohol to the water in which they are collected. Larger forms can be killed the same way but must be opened afterwards to let the preservative penetrate body cavities. Insects can be dropped directly into alcohol.

What can the boys and girls use? What kinds of animals? Leave that to them—or suggest looking for some of the following:

#### On land:

All local types of animals, earth-worms, hundreds of insect types, land snails, spiders, birds (if you are adept at taxidermy, but don't let the youngsters go out just to kill birds—it's more fun to have a feeding station or to go on bird walks), toads, lizards, snakes, embryos from slaughtered animals.

#### At the seashore:

Star fish	Sea urchin
Sponge	Sea cucumber
Jelly fish	Sand dollar
Polyps	Barnacle
Coral	Crab
Sandworm	Horse-shoe crab
Lobster	Insects
Fishes	Clam
Octopus	Oyster
Squid	Mussel

#### Fresh water (ponds, streams, springs, swamps):

Sponge	Snail
Liver fluke	Mussel
Planaria	Fish
Crayfish	Mud puppy
Clam	Frog
Turtle	Salamander
Alligator	Aquatic insects

The Riker mount, a flat cardboard box filled with cotton and having a glass cover makes an excellent display case. Insect life histories, leaf specimens, and many other exhibits may be arranged in these neat, protecting cases. It is well to have a supply of them on hand as the boys and girls will be able to suggest and produce a multitude of interesting displays.

In the same way, exhibition boxes made of cardboard with glass tops can be utilized by pupils. Figure 1 shows a series of representatives of various orders of insects prepared by the boy and girl in the picture at the beginning of the article. The boxes are not expensive to purchase from a biological supply house and the labels can be cut out of old catalogues or can be hand printed.

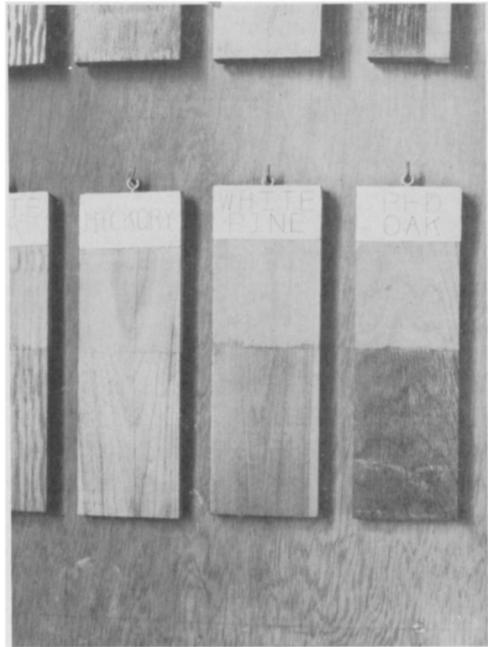
One pupil made little transparent pockets from cellophane saved from cigarette packages and filled them with various types of seeds to show adaptations for dispersal. These envelopes were fastened to a large sheet of cardboard and appropriately labelled.

Ears of corn showing various types or

exhibiting hereditary traits can be hung in the biology laboratory to add interest.

The local druggist often has beautiful posters or reproductions of paintings which he will lend or give away. One drug company is using paintings to portray events in the history of medicine and these make worth while additions to any laboratory.

Some boys who were taking a wood-working course in shop asked their instructor for odds and ends of various kinds of wood. The boys then sawed the pieces to a uniform size, planed them and varnished one-half of each specimen. A screw-eye fastened in one end made it possible to hang these pieces on hooks screwed into a ply-wood board. The photograph (Figure 2) shows one corner of this display board with several wood samples in place.



## Teaching and Learning Aids in Biology\*

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Teaching and learning aids in biology are so varied and numerous, that in a short report of this type, it is difficult to determine the limits of the field and to do justice to any one aid. I shall limit my discussion to generalization rather than to any one specific aid.

A biology teacher greeting his class for the first time asked: "What will you learn of me?" The reply came: "How shall we learn to live together in peace? How shall we learn to work together? How shall we care for our bodies? How shall we play? How shall we see and understand the things about us? How shall we rear our children? For what ends shall we live?" The teacher pondered these words and sorrow was in his heart, for his own learning touched not upon these things.

\* Part of program of NSTA, assigned to NABT.

Although the author who first presented this illustration is unknown, the lesson it imparts needs to be made a part of every biology teacher today. We need to ask ourselves these questions over and over again, until their answers become our way of living and teaching. Real teaching must be human, down to earth, and practical. Modern biology draws from so many fields of knowledge for its materials to fit the interests, needs, and abilities of individual pupils, that no single textbook is adequate. Most of our materials for living and teaching biology lie outside the textbook.

Teaching and learning aids provide the means by which biology becomes the dynamic and fascinating subject of life. Contact with life provides first-hand observation, pulsating with activity rather than the deadening stagnation which re-