

Hence the live fish can only retain its position by active motion. Probably the pairs of fins on its under surface are chiefly instrumental in this, and particularly the front pair, which are constantly in motion whether it is moving forward or not. The large unpaired fins on the upper and under surface are usually extended and offer considerable resistance to its turning over. The chief organ of locomotion is the tail fin. Whenever it moves forward this can be seen in rapid motion from side to side. But when this tail fin moves to one side it would tend to turn the front of the body in the opposite direction and it is here the unpaired fins on the dorsal and ventral surface come into play. By their broad surface they offer great resistance to lateral motion and thus the tail fin can move rapidly from side to side without turning the rest of the body to any considerable extent in the opposite direction. The tail is also the chief steering organ to the right or left and it can also serve to bring it up or down as the lower or upper part of the fin is moved the more vigorously. For steering in the vertical direction the pairs of fins on the under surface are also useful.

The red gills are the breathing organs. The gill covers are regularly opened and closed and the mouth does the same. The purpose of these motions is to cause a continuous circulation of water over the gills; it enters the mouth and passes through the slits between the gills and out through the opening behind the gill cover. The water contains dissolved air which purifies the blood as it surges through the gills.

The eyes have no eyelids and do not need them as the eyeball being in contact with the water is always moist. Vision is probably fairly keen though there is some doubt as to both the keenness of sight and the sensitiveness of hearing. A double pair of nostrils are present at the top of the snout; these serve as organs of smell.

Almost all the above facts can be observed by the pupils under the guidance of the teacher.

Dispersal of Seeds.—Let each pupil take a pot of earth, place it in a warm room and keep it moist but not wet. Count all the plants that begin to germinate, pulling them out shortly after they come up. Let this be continued for at least a month. Some should get from fifty to a hundred. Discuss with the pupils the origin of the plants, and impress on them that each came from a seed and each seed was once on a plant. Then question them as to how the seed got from the plant to the soil. This will form an introduction to show the significance of distribution and to arouse an interest in the methods. Let the pupils collect the fruits of the following plants for study: milkweed, maple or bass-wood, burdock, or beggar's ticks, garden baslam or vetch (wild pea), apple or peach. The most of the following observations can best be made by the pupil in the fields, though each should also be studied