

# Specific Learning in School Biotope Activities (Especially Schools in Urban Areas)

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## Perspective

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### About the Study

Nagoya University of Economics, Ichimura high school is an urban school located in Nagoya city, Japan. The school joined United Nations Educational, Scientific and Cultural Organization (UNESCO) associated schools network in 2023. Our school was founded 115 years ago, and the founding spirit of the school is expressed in "Yabutsubaki" written by the founder Yoshiki Ichimura. The phrase "Sakura na sakura, matu na matu tare" expresses respect for individuals based on this founding spirit, the classrooms were named "Sakura" (Cherry Blossom), "Matu" (Pine), and "Enoki" (Hackberry), and the same types of plants were carefully planted and nurtured on the school grounds.

However, the development of school facilities has led to the disappearance of the natural environment and disruption of the ecosystem, posing a risk of gradually losing the nature that should be preserved for future generations. In order to achieve Sustainable Development Goal 15 (SDG 15) "Life on Land" we need to think globally and act from the ground up. To realize this policy, since 2013, students and teachers have been collaborating to create a "school biotope" consisting of farmland, forests, grasslands, etc., and use it to learn about biodiversity conservation activities.

Since 2013, practical training in vegetable cultivation (vegetables, fruit trees, flowers) has been conducted in the school biotope, and the diversity of species such as trees, insects, and birds has been investigated. The natural regeneration of the school biotope was carried out by removing waste materials and plastic garbage. In vegetable cultivation, soil improvement was carried out using compost derived from fallen leaves and compost from food waste in the cafeteria. Chemical analysis of the soil was performed. In addition to the compost pit, stones and branches were piled up to make an eco-stack. In addition, since there is no river near the school, we tried setting up a watering place. However, many times the watering hole dried up and it did not work well (Figure 1).

**Figure 1.** Students digging water hole.



In the Nagoya Biological Survey 2021, we collaborated with people from other survey sites across Nagoya. We investigated the diversity of ladybugs on campus and reported the results to students from experts. Seven species of ladybugs were identified in this survey, two of which were invasive. One of the non-native species, *Platynaspidium maculosus*, was first identified in Nagoya, Japan. It is carnivorous and preys on aphids (Figure 2).

**Figure 2.** Invasive species of lady bugs observed in the school campus.



Students learned about biodiversity, deepened their understanding in dealing with non-native species, and thought about how to attract more living creatures to the school biotope. This was an excellent opportunity to gain insight. We promoted activities related to biodiversity conservation, centering on the school biotope, both inside and outside the school (Figure 3). The format of the presentation consisted of both presentation and stage presentations, and sometimes flyers were prepared and distributed for activity reports. On campus, we gave presentations during classes and at cultural festivals. Outside of school, we presented during classes and at cultural festivals, and at events held at facilities and universities in Nagoya city.

Students used wild bird cards, which are original science teaching tools, to explain the ecology of wild birds to younger elementary school students. Biological conservation activities are carried out in our workshops and biology classes. Through these activities, students have come to better appreciate the value of life by interacting with living creatures on-site. This leads to the acquisition of knowledge and wisdom, allowing students to gain experience through activities related to the investigation, analysis, and conservation of biological diversity.

**Figure 3.** Students performing activities to promote the conservation in school biotope.



By investigating the diversity of ladybugs, students were able to directly look at a part of Nagoya's environment and compare it with data from other survey sites, which led to ideas that would lead to solving local environmental problems (Figure 4). Biological surveys are proceeding systematically, and we were able to learn about the diversity of species in land snails in 2022 and an ant species diversity in 2023. In 2024, we are investigating the species diversity of spiders. Moving forward, it will be necessary to promote the development of the school biotope by announcements inside and outside the school, as well as to develop regional cooperation and educational activities using the school biotope. In addition to students in biology classes, we have also started the Ichimura Manabi cafe, making it easy for students and teachers from all schools to participate in activities.

Furthermore, we have revised our own science teaching materials based on trees, birds, insects, etc. on campus and are using them in our presentations. One of the challenges of the school biotope is creating water areas to attract more birds to the campus, and we are trying to create a satoyama (traditional Japanese rural landscape) model. Through activities that contribute to biodiversity, we aim to develop students and teachers who can recognize real environmental issues and take action to address them.

**Figure 4.** (A) A group of students employed in sample collection; (B) Students employing various techniques in collecting the sample; (C) Examining the available samples on the leaves; (D) Searching for the samples if in the specified zone.

