

## Humane Science Projects



### Suggestions for Biology Studies That Are Scientifically Educational and Ethically Noncontroversial

compiled by Jonathan P. Balcombe, Ph.D., The Humane Society of the United States

- Study the growth of molds on food items under different growing conditions; vary the foods and growing conditions.
- Observe birds at a feeder. Which species eat together? Which species leave when other species arrive? Which species eat which seeds, fruits, and berries and why?
- Which bird species are attracted to which types of birdhouses and/or cover vegetation and why?
- Count the seeds on plants. How many seeds do different plants produce? How does the number of seeds vary among seed pods on the same plant? Different plants of a single species? Different species? Why?
- Survey a particular plant species for insect life. What sorts of adaptations do certain species have for living on this plant (e.g., camouflagic coloration)? Monitor the number of insect visitors to a small cluster of flowers or plants: How does visitation change with time of day, year, weather, etc.?
- Grow bean sprouts in commercial sprouters (beans and sprouters are available in natural food stores). Compare growth rates of different types of beans and different lighting conditions. Compare different sprouter designs. Compare the taste preferences of students.
- Design a study involving placing different food items near the entrance to one or more ant colonies and recording the behavioral responses of the ants in order to study their food preferences.
- Do a comparative study of plants, such as two populations of dandelions (one growing in an undisturbed area, the other in a more disturbed area). Examples of data that could be collected: stem length, seed number, density, leaf area, seed plume length and width, etc.

### Note to teachers

Using PETA literature, acquaint students with animal rights issues. Encourage discussion in class, comparing older, widely held beliefs with a more modern understanding of our relationships with our fellow animals. Assign these ideas as essay or research topics or use them as guidelines for class discussions.



- Collect, grow, and study bacterial cultures from various places, such as garbage cans, doorknobs, and people's mouths. Compare the bacteria in people's mouths before and after brushing.
- Study leafing patterns of trees or bushes. Which species drop their leaves for the winter? Which drop their leaves the soonest? Which leaves change color? Why?
- Prepare an arboretum of plants growing on the school property.
- Observe nesting birds (e.g., watch the nest for an hour each day, estimate the number of insects consumed, based on the number of trips to and from the nest, then extrapolate over all the daylight hours). Do males and females perform the same amount of parental duty?
- Study absenteeism in school; try to relate it to colds, flu, and other illnesses.
- Use a water analysis kit to test the water at various points along a river or stream, to associate bacterial contaminants and other things (such as turbidity) with sewer plants, runoff, etc.
- Do a physiological self-study. For example, test hearing directionality by blindfolding fellow students and tapping a metal object to the right, left, front, and back of the subjects; test smelling and tasting accuracy of students using juice from various fruits, for example.
- Investigate leaf and leafing adaptations. For example, relate leaf shape and area to habitat or the effects of light availability.
- Do a habitat analysis on a local piece of undeveloped land. What types of trees are there? What types of animals are there? How might they interact?
- Survey roadkills. Relate them to different locales (rural vs. urban) and road types (paved vs. unpaved; two-lane vs. four-lane). Are there solutions? [Caution: For health and safety reasons, animal carcasses should not be handled.]
- Find a roosting tree (or trees) of a gregarious species of bird. Determine from which direction most of the birds enter or leave the roost. Crows and starlings are excellent species for observational study; they are abundant, very active, intelligent, social, vocal, and opportunistic.
- Grow individual plants in different conditions and study and compare their growth patterns. For example, change lighting conditions (direction, amount, and timing).
- Visit a local pond where bats forage at dusk. Time the arrival of the bats on different nights and see if it correlates with the time of year (official sunset data can be obtained from a local weather station). Estimate insect abundance by counting the bats' sudden changes in flight direction (attacks), etc.
- Compare the fauna on organic farms with the fauna on farms where pesticides are used. Relate the results to current trends toward organic farming.
- Examine air pollution by sampling (say, by rubbing them with white tissue paper) the surfaces of tree leaves or buildings in different areas of a city. If you live near an



industrial incinerator, you might compare samples taken at different distances (100 yards, 1 mile, 5 miles, etc.) from the incinerator.

- Compare trunks of dead trees with those of living trees in a wooded area. For example, compare woodpecker holes, fungal growth, etc.
- Conduct a behavioral study of your animal companion(s) at home. For example, to what sounds do they respond? Tape record different voices and monitor the animal's response when they are played back (i.e., all visual stimuli have been eliminated). Compare the response to different vocal inflections. Observe your sleeping animal companion closely and monitor his or her body movements and frequency of REM sleep. Examine play behavior, etc. A video camera may be very useful for such studies.
- Measure the heights of students in the class. Conduct a statistical analysis (mean height, standard deviation, significant differences based on age or sex). Compare the statistics for small and large groups of students.

