

Pond Water Survey

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Illinois Learning Standards: 12.A.3a, 12.A.3b, 12.A.3c

[Back to Biology Lessons](http://sciencespot.net/Pages/classbio.html) <http://sciencespot.net/Pages/classbio.html>

Links to [Pond Water sites](#) are available in the Kid Zone!

Teacher Notes:

Lesson Objectives:

As a result of this project, students will be able to:

- (1) Identify and describe various organisms living in a pond water environment.
- (2) Describe the characteristics of living things.
- (3) Compare and contrast organisms created by asexual reproduction and sexual reproduction.
- (4) Classify biotic and abiotic factors in a pond water environment.
- (5) Describe the life cycles of various freshwater organisms.

Materials Needed:

Small backyard pond or other water source

Microscopes

Materials for observation - slides, cover slips, eyedroppers, and Detain (optional)

Small vials for water samples (filter/screens would also be helpful to reduce the samples)

Identification Guides (My students use Pond Life by Golden Guides and Internet resources (listed in the Biology section of the Kid Zone.)

Items for measuring volume of water source (rulers, graduated cylinders, etc.)

Water testing materials (optional)

Journal report papers (Project Procedures, Index of Organisms, Project Conclusion)

Teacher Directions:

Divide students into research teams consisting of 2 - 4 students. Each team will be required to prepare a Pond Water Survey based on the report guidelines. Research teams will need to communicate with other teams to determine the volume of the pond and population counts. Other portions of the report should be completed by each team.

Gather the equipment and resources needed for the project. Students should know how to use microscopes and be able to make wet mount slides. Once project procedures have been developed and approved, teams should begin their research. A list of online sites related to freshwater organisms has been provided on the Kid Zone.

Part A: Project Procedures

Develop testing procedures for each of the following:

- (1) How will you determine the volume of the pond?
- (2) How will you collect and record data?
- (3) How will you determine population counts of 10 organisms?
- (4) How will you communicate with other research teams?

Part B: Report Guidelines

The completed report must include:

1. Description of water source

(a) Size, volume (in milliliters, liters, and gallons), location, temperature, and water quality issues

(b) List biotic and abiotic factors of pond

* Depending on available resources, testing data related to dissolved oxygen, ammonia, nitrates, pH, nitrites, and various minerals) is optional

2. Population survey

Estimated population counts for 10 organisms (at least 3 must be plant life).

Calculations to support your estimates must be provided

A graph must be created to display population counts.

3. Index of organisms

Provide the following information for each organism included in your population survey:

(a) Name

(b) Classification

(c) Diagram

(d) Brief description (color, size, shape)

(e) Method of movement

(f) Reproduction

(g) Food source(s)

(h) Life cycle diagram

Part C: Project Conclusion

Answer the following questions:

(1) What life characteristics did you observe in living organisms in your water samples?

(2) Give examples of each: unicellular and multicellular.

(3) What types of features did you observe in living organisms relating to adaptation, competition, and survival potential (i.e. appendages, camouflage, defensive structures)?

(4) How do organisms produced through asexual reproduction differ from those produced through sexual reproduction?

(5) Compare and contrast autotrophs and heterotrophs.

(6) Draw a diagram to show the food chain of a small pond community.

Project Worksheets:

- (1) Project Procedures - pdf
- (2) Index of Organisms - pdf
- (3) Project Conclusion - pdf

Helpful Web Links

<http://mbgnet.mobot.org/fresh/index.htm>

This site features a wealth of information regarding freshwater biomes including Rivers and Streams, Ponds and Lakes, and Wetlands. This site has a great slide show about aquatic organisms that inhabit these various environments.

<http://sciencespot.net/Pages/kdzbiopond.html>

Includes Links to these sites

Pond Life ID Kit - <http://www.microscopy-uk.org.uk/index.html?http://www.microscopy-uk.org.uk/pond/index.html>

Smallest Page - http://www.microscopy-uk.org.uk/mag/wimsmall/x_small1.html

Microbe Zoo - <http://commtechlab.msu.edu/sites/dlc-me/zoo/>

Freshwater Ecosystems - <http://mbgnet.mobot.org/fresh/index.htm>

EcoWatch Invertebrates - <http://www.ento.csiro.au/Ecowatch/Invertebrates.htm>

Adopt-A-Pond - <http://www.uen.org/utahlink/pond/>

Protistic Park - http://www.funsci.com/fun3_en/protists/entrance.htm

Aquatic Macroinvertebrates Keys to Identification

<http://www.dec.state.ny.us/website/dow/stream/orderpageone.htm>

BioMedia Gallery - Life in a drop of water

<http://ebiomed.com/gall/drop/dropmain.html>