

DETERMINING SPECIES RICHNESS OF ANURANS IN LOCAL PONDS

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Abstract

This experiment is designed to compare the number of species of frogs and toads in different sized ponds to see if the size of the pond affects the number of species.

Objectives

To compare the number of species of frogs and toads in different sized ponds to see if the size of the pond affects the number of species.

Problem

Does the perimeter of a pond affect the number of species of frogs and toads that live there?

Hypothesis

I think that: _____

Materials

- A local pond between 25 and 400 m in perimeter
- Cassette of native frog and toad calls
- Data collection sheet
- pencil
- Stopwatch or wristwatch

Method

1. Get with your three other group members, and find a pond that is easily accessible and fits within the measurement guidelines. (Be sure to check it out before you begin to listen for anuran calls.)
2. Measure the perimeter of your pond with the pacing method. (the number of paces x the pacer's stride length in meters)
3. Familiarize yourself with the ten native anuran calls learned in class, and utilize your cassette copy of those calls.
4. Choose three separate dates of good weather when you will go listen for the calls.
5. Go to your chosen pond on the specified dates, and listen to the anuran calls from 7:00 - 7:30 PM.
6. Record on your data chart the species you heard calling during that time.
7. On the specified day in class, post your data and analyze class information with the Spearman Rank statistical test.
8. Determine if the number of species is affected by the pond perimeter size.

Data

Dates chosen to collect data:

Day 1: _____

Day 2: _____

Day 3: _____

See attached data sheets to record your data.

Significance from Spearman Rank Test (P): _____ Is this significant?

Conclusions

1. When listening for the calls, what sex of anuran were you hearing?
2. Which type of call was the most common?
3. Why is it best to do this type of activity in the spring?
4. Did you hear more frogs or toads?
5. Why do anurans tend to congregate around ponds?
6. What does species richness mean?
7. By the results of the Spearman Rank Test, was your original hypothesis supported?
8. What other factors could have influenced the number of species you heard each night?
9. How could you change this experiment to account for some of the things you mentioned in #7?
10. Why (or why not) do you think does the perimeter size of the pond affect the number of anuran species?
11. What other kinds of animals could we track using this same method?

TEACHER'S NOTES:

Target Audience

Upper level students in:

- Biology, in an environmental unit
- Zoology, in a study of anurans
- Environmental Science, in a unit on populations

Type of Activity

Hands-on

Inquiry lab

Materials Necessary

- 4 or more small local ponds
- CD or cassette of frog and toad calls
 - (I used North Word Nature Guide: The Calls of Frogs and Toads. This is produced by Naturesound Studio. Call 1-800-336-5666 for more information)
- Blank cassettes for the student copies of the calls
- Student worksheet and data guide
- A statistical analysis program (I used E-Z Stat)

Information for the teacher

It is strongly suggested that the teacher become very familiar with the sounds and physical characteristics of the native frogs and toads. Also, the teacher should check locations of local ponds and find out about student accessibility to each. Since this must be done in the evening, it might be a good idea to send home a form for the parents to sign so they know what to expect.

Required of Students

The students must have background knowledge about different kinds of frogs and toads that can be found in the area. It is important to know basic characteristics of anurans and to recognize different types of calls. It is recommended that the student bring in a blank cassette so the teacher can send home a copy of the specific frog calls.

Preparation Time

A few weeks spent ahead of time learning to identify different anuran calls would be helpful. One class period (45 minutes) should be sufficient to explain the project to the students. At this time, a due date should be set for when all information is due back to class. Preparation times for setting up the computers for statistical analysis will differ by school and by program.

Special Suggestions

As a unit on anurans, I have the students memorize 10 native frog and toad calls. I play the specific calls from the CD at the beginning of class for a few weeks before I have the students do the project. I quiz the students on identifying the anuran based on the calls. Specimens of each native species are also an excellent way for the students to visualize what they are hearing. A dichotomous key for native amphibians is a great way for them to learn to identify organisms.

Methods of Evaluation

- Discussion by groups and/or class
- Completion of student worksheets and/or
- Individual or group lab reports

DETERMINING SPECIES RICHNESS OF ANURANS OF LOCAL PONDS

Pond Name:									
Pond Size (m):									
Location:									
County:									
Common name of species:									
1	Bullfrog								
2	Green Frog								
3	Carpenter Frog								
4	Southern Leopard Frog								
5	Pickeral Frog								
6	Green Tree Frog								
7	Gray Tree Frog								
8	Cope's Green Tree Frog								
9	Spring Peepers								
10	Northern Cricket Frog								
11	American Toad								
12	Oak Toad								
13	Pinney Tree Frog								

Total: (species richness)