

Title: Point Counts

Abstract: In this study, students will use “point counts” to investigate how the types and numbers of birds in the schoolyard changes during the year.

Author/Adapted from: Jornada Basin LTER and Chihuahuan Desert Nature Park’s Schoolyard Desert Discovery Project

Time: 30 minutes (preparing for and conducting point counts)
45 minutes - 1 hour (analysis and conclusions)

Grade Level: 3rd - 12th

Background: There are more than 9,300 species of birds distributed over the earth. The highest concentration of species diversity is in the tropical areas, while species diversity is lower at the poles. Temperate areas in North America, Europe, and Australia are relatively equal in the disbursement of bird species.

“Point counts” are often used by ornithologists and ecologists to study bird populations. The observer stands at a set point or observation post and records the number and type of birds seen within a given area. The data are used to estimate relative abundance and population trends of particular bird species. By conducting this study once a month for the entire school year, you will notice fluctuations in the number and species of birds seen.

The fluctuations in numbers and species of birds being observed might be attributed to migration. It is theorized that a reduction in food is the main reason for migration. For example, of all the insectivores in higher latitudes in North America, the only species that over winter are a few woodpeckers and nuthatches that can extract their prey from the trunks of leafless trees. Migration occurs both during the day and at night. While most birds travel alone, some migrate in flocks of single or multiple species. Migrating in flocks aids in protection against predators and aids the younger migrants.

Objectives: The student will be able to:

- Record and graph bird numbers at different locations during the school year.
- Draw conclusions about the seasonal bird populations.

Advance Preparation:

None

Materials:

- Metric measuring tapes
- Binoculars
- Bird identification books and identification sources
- Colored pencils

Tips for Entire Class Participation:

- If you have a large class, establish more observation posts. Make sure the boundaries of each observation post are at least 10 meters apart to avoid students counting the same birds.
- Assign one group to each observation post. A group can contain as few as two students, one to observe each half of the circle. To accommodate more students in each group, you may assign one pair of students a certain group of birds to observe (e.g., one pair could observe pigeon-type birds, another pair could observe sparrows and finches, and another pair could observe all other species).

Procedures:

- 1) Have students learn to identify common bird species in your schoolyard. The Bird Identification Activity is good preparation for this study.
- 2) Have students select two to five observation post locations in your schoolyard. Use the same posts for the entire study. These can be posts that you install or features that are already present, such as a fence post or a basketball hoop.
- 3) Measure a 20-meter radius circle around each observation post. The circle extends as a vertical column into the air, incorporating any flyovers by birds. Marking the observation area with posts and flagging tape or using existing landmarks will help students identify the observation area boundaries. There should be at least 10 meters between observation boundaries.
- 4) Have students sit in the center of the observation circle and observe 1/2 of the circle with another student facing the opposite direction and observing the other half.
- 5) On each observation day, students make observations for 10 minutes. Observations are taken once a month at the same time each day. Remind students that they must be very quiet while doing their observations so that they do not affect the birds' behaviors.
- 6) During observations, students record the observation post number and the number and type of bird observed at that post on the Bird Diversity Data Sheet. If there are species that students do not recognize, have them write as many details as possible on the chart so they can later try to identify the bird using books and other resource materials (see sample chart).
- 7) After the observation period, total the number of different species observed at each post and record these values on the Class Diversity Data Sheet. Average the number of species observed each month across all observation posts and plot this number on the graph.
- 8) Choose three to five of the most common species on your schoolyard. Have students total the number of each of these species seen each month on the Class Population Data Sheet. Graph these values.

Evaluation: Allow students to draw conclusions from the graphs and monthly data sheets. How does the total number of species vary across the year? What might explain this pattern? Do some bird species have greater seasonal fluctuations than others?

Extensions: Have students record the sex of the birds they observe during the point counts (when possible) to examine trends. In species that migrate and nest in our area, do the males arrive before the females?

Bird Diversity Data Sheet - SAMPLE

Observation Post Number: 4

Location of Post: Basketball hoop on the south side of the building

Date	Bird Species	Number of Individuals
Sept 12, 2005	Chipping sparrow	4
Sept 12, 2005	White-winged dove	7
Sept 12, 2005	American robin	1
Sept 12, 2005	Turkey vulture	3
Sept 12, 2005	Black-chinned hummingbird	1
Sept 12, 2005	??? (medium, bill curves down at end, reddish eye, brown, white on throat)	1

Class Diversity Data Sheet - SAMPLE

Date: September 12, 2005

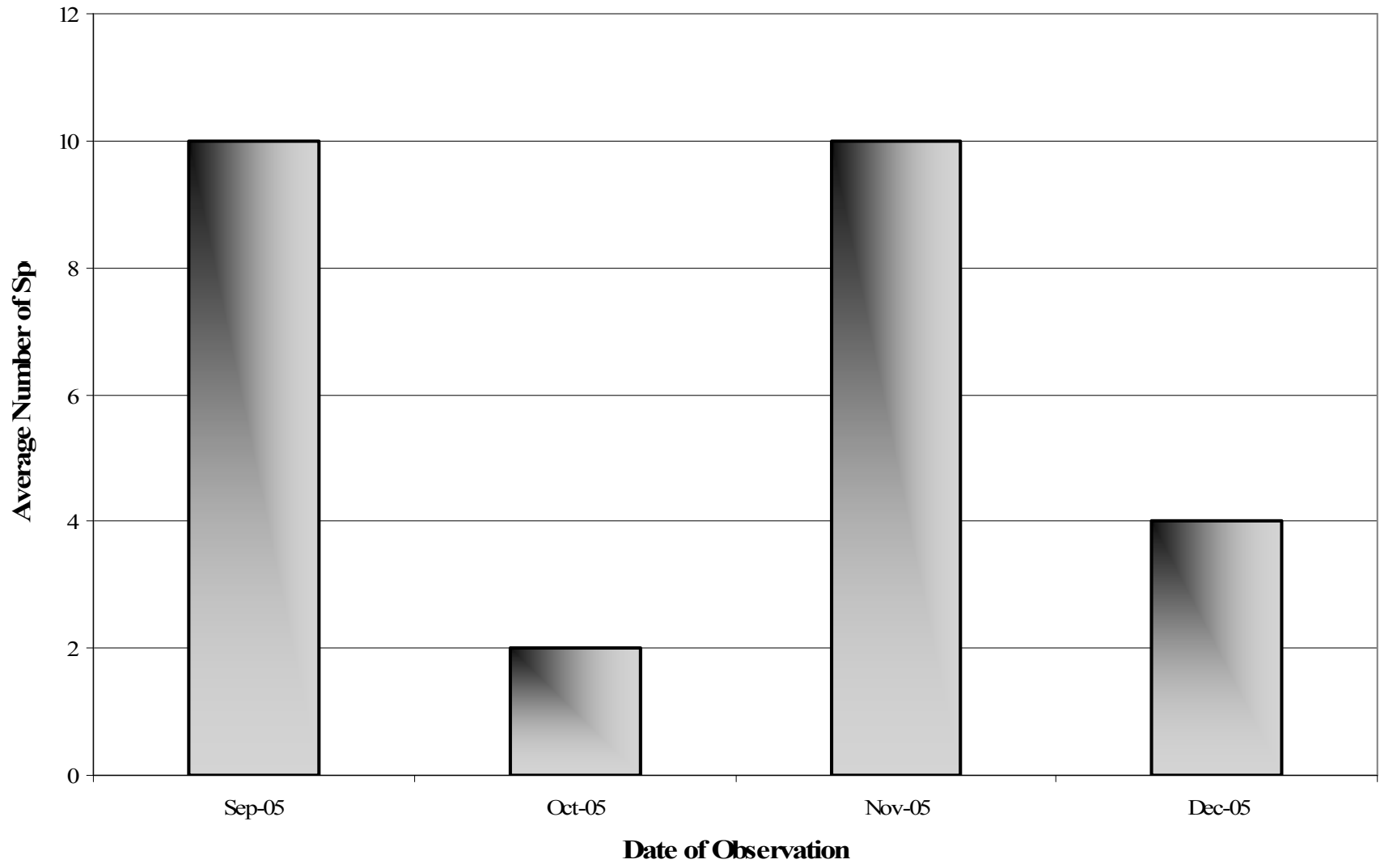
Post Number	Number of Species
1	11
2	9
3	10
4	6
5	14
Average	10

Class Population Data Sheet - SAMPLE

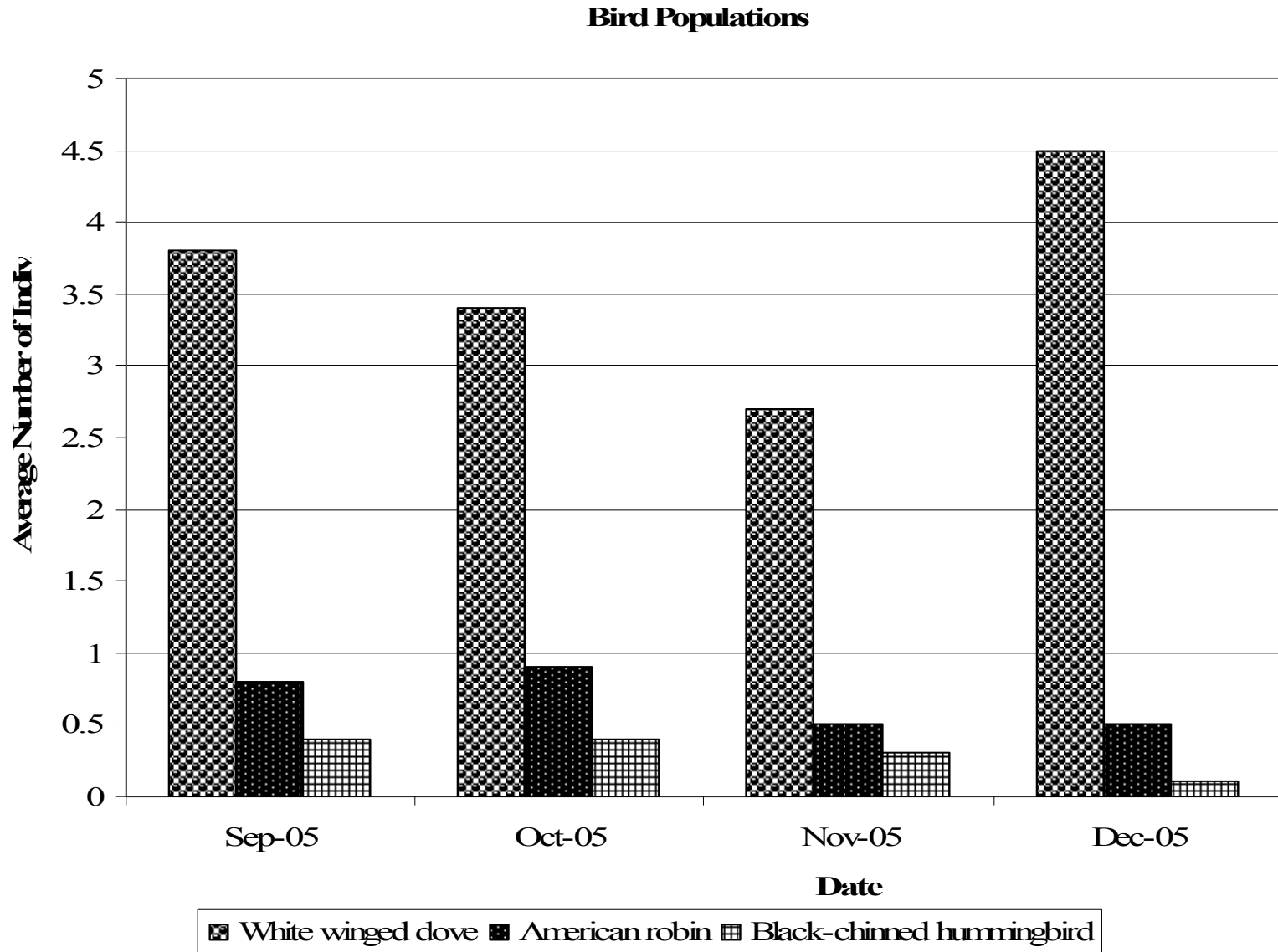
Date: September 12, 2005

Species	Number of Individuals					Average
	Post 1	Post 2	Post 3	Post 4	Post 5	
White-winged dove	2	4	0	7	6	3.8
American robin	0	0	2	1	1	0.8
Black-chinned hummingbird	0	0	0	1	1	0.4

Bird Diversity



Bird Diversity Graph - SAMPLE



Schoolyard Bird Diversity & Populations

Question: How do bird diversity (number of species) and population sizes change during the school year?

Materials:

- Metric tape measure
- Binoculars
- Bird identification books and other identification sources
- Colored pencils

My Hypothesis: _____

Procedures:

- 1) Select two to five observation post locations in your schoolyard. Use the same posts for the entire study. These can be posts that you install or features that are already present, such as a fence post or a basketball hoop.
- 2) Measure a 20 meter radius circle around each observation post. The circle extends as a vertical column, incorporating any flyovers by birds. Marking the observation area with posts and flagging tape or using existing landmarks will help identify the observation area boundaries. There should be at least 10 meters between observation boundaries.
- 3) One student sits in the center of the observation circle and observes 1/2 of the circle. Another student faces the opposite direction and observes the other half. No student will be observing more than one observation post.
- 4) On each observation day, at the same time each day, make observations for 10 minutes. Be very quiet while doing your observations so that you do not affect the birds' behaviors.
- 5) During observations, record the observation post number and the type and number of birds observed at that post on the My Observations of Bird Diversity Data Sheet.

- 6) After the observation period, total the number of different species observed at each post and record these values on the Class Diversity Data Sheet. Average the number of species observed each month across all observation posts and record this average on the Bird Diversity graph.
- 7) Choose three to five of the most common species on your schoolyard. Average the number of each of these species seen each month on the Class Population Data Sheet. Record these numbers on the Bird Population graph.

Results: See your graphs.

Conclusions:

Diversidad y Población de los Pájaros en el Terreno de la Escuela

Pregunta: ¿Cómo cambian la diversidad de los pájaros (número de especies) y el tamaño de la población durante el año escolar?

Materiales:

- Cinta métrica
- Binoculares
- Libros de la identificación de los pájaros (y otros fuentes de identificación)
- Lápices a colores

Mi Hipótesis: _____

Métodos:

- 1) Elige de dos a cinco sitios de observación en el terreno de la escuela. Usa los mismos sitios para el estudio entero. Pueden ser sitios que Uds. instalan o cosas que ya existen, como un poste o un aro de basquetbol.
- 2) Mide un radio de 20 metros alrededor de cada sitio de observación. El radio extiende como una columna vertical, así incluyendo cualquier pájaros que vuelan sobre el área. Marcando el área de observación con postes y cinta marcadora o usando guías que ya existen te ayudará en identificar los bordes del área de observación. Debe estar a lo menos 10 metros entre los bordes.
- 3) Un estudiante se sienta en el centro del círculo de observación y observa 1/2 del círculo. Otro estudiante se sienta hacia la otra dirección y observa la otra mitad. Ningún estudiante observará más de un sitio de observación.
- 4) En cada día de observar, a la misma hora del día, observa el sitio de observación por 10 minutos. Guárdate el silencio mientras haces las observaciones para que no afectes el comportamiento de los pájaros.
- 5) Durante las observaciones, anota el número del sitio de observación y el número y tipo de pájaros observados en ese sitio en la Hoja de Datos: Mis Observaciones de la Diversidad de los Pájaros.

6) Después del período de observación, sumar el total de los especies diferentes observados en cada sitio y anota estos valores en la Hoja de Datos: Class Diversity. Haz un promedio del número de especies observado cada mes al través de todos los sitios de observación y anota este promedio en la tabla de la Diversidad de los Pájaros.

7) Elige de tres a cinco de los especies más comunes en tu terreno de la escuela. Haz un promedio del número de cada de estos especies vistos cada mes en la Hoja: Class Population. Anota estos números en la tabla de Bird Population.

Resultados: Ve tus tablas.

Conclusiones:

Student's Name _____

Bird Diversity Data Sheet

Observation Post Number: _____

Location of Post: _____

Date	Bird Species	Number of Individuals

Student's Name _____

Class Diversity Data Sheet

Date: _____

Post Number	Number of Species
1	
2	
3	
4	
5	
Average	

Class Population Data Sheet

Date: _____

Species	Number of Individuals					Average
	Post 1	Post 2	Post 3	Post 4	Post 5	

Student's Name _____

Bird Diversity					

Date of Observation

Average Number of Species

Student's Name _____

Bird Populations						Date of Observation
Average Number of Individuals						