

## Unit III

### Lesson 2    **Schoolyard Feeder Research Materials & Methods**

**OBJECTIVES**    Students will...

1. Demonstrate the proper care and use of binoculars.
2. Practice recording and summarizing data for their Feeder Research Project using observation sheets and team reports.

**DURATION**    Three 45 minute sessions

**MATERIALS**    **Note: For Aviary Staff-taught lessons, items 1-10 are provided by Tracy Aviary.**

1. Binocular bin: binoculars, lens cleaning cloths
2. Birds of Utah field guide & Utah Birds folder
3. Binocular Checkout Sheet (See Appendix)
4. An Introduction to Binoculars (See Appendix)
5. Set of five Bird Word Cards (See Appendix)
6. Feeder Observation Sheet, one per student (See Lesson 1 Appendix)
7. Bird Food Log Sheet (See Appendix)
8. Master Observation Sheets, five total, one per feeder or ground (See Lesson 1 Appendix)

Make five copies of the Master Observation Sheet, which will allow the entire class to track progress during the feeder study. These can be made in three ways:

- a. Photocopy the Master Observation Sheet onto transparency media and use it to project the students' data periodically. Make five transparencies, one for each feeder observation site (A, B, C, D & G).
- b. Enlarge photocopies of the Master Observation Sheets onto 11 x 17 paper and post on the classroom wall for students to track their research progress throughout the project. Make five large copies, one for each feeder observation site (A, B, C, D & G).
- c. Keep a digital version of the Master Observation Sheet and enter data into this file throughout the research project. Project the chart periodically for your class to help them follow along with the progression of their research project.

9. Feathered Friends Field Guide Posters, five total, one for each group (See Lesson 1 Appendix)
10. Unit III Avian Explorer Handbook, one per student
11. Clipboard, pencil and scratch paper, one of each per student

**ADVANCE  
PREPARATIONS**

1. Be sure students have completed the following pages in the Student Journal section of their Avian Explorer Handbooks:
  - Page 3, The Scientific Method
  - Page 4, What Bird is That?
2. Prepare a color transparency or digital image of An Introduction to Binoculars.
3. Prepare the five Master Observation Sheets.

**AVIAN  
EXPLORER  
HANDBOOK**

**PAGES TO BE USED IN THIS LESSON**

Student Reference Guide Pages

- Page 1, Team Record Sheet
- Page 2, My Schoolyard Research Project

**APPENDIX**

Binocular Checkout Sheet  
 An Introduction to Binoculars  
 Bird Word Cards  
 Bird Food Log Sheet

# Instructional Sequence

## ENGAGE IT'S ALMOST TIME TO BEGIN OUR RESEARCH!

1. Explain to the students that there are a few more things to learn before they begin their schoolyard feeder research.
2. Briefly explain that the following tools include:
  - a. FEEDER OBSERVATION SHEETS: Hold up an example and explain that everyone will need to record data on one of these during each feeder observation session.
  - b. TEAM REPORTS: Explain that there is a part of the Feeder Observation Sheet where everyone will summarize the team's "official data report" at the end of every observation session.

The total number of bird species and number of individual birds the group observed will be tallied and written in the "Team Total" boxes on the Feeder Observation Sheet. The Team Captain will be responsible for delivering his or her observation sheet with the team totals to the teacher.
  - c. MASTER OBSERVATION SHEET: Hold up an example and explain that this is where the data from all of the teams will end up. There will be a total of five Master Observation Sheets, one per feeder (and ground). When they finish their feeder observations it will help them analyze their data and determine if their hypothesis is correct.
  - d. STUDENT HANDBOOKS: Each student should have a personal copy of the Avian Explorer Handbook, both for reference and for showing how much everyone has learned.
  - e. BINOCULARS: Hold up a pair of student binoculars and remind the students of how valuable of a tool this is to an ornithologist. Explain that binoculars improve our vision to *almost* as good as an eagle's!
3. Let's begin with the binoculars...

## EXPLORE BINOCULAR CARE & HANDLING

1. Explain that each student who shows that he or she can be responsible for the appropriate use and care of binoculars will receive a pair to use during each feeder observation session.
2. Take a pair of binoculars from its case and hold them up for the students to see. Ask if anyone has had experience using binoculars before.
3. Investigate how well students are prepared to use binoculars by asking volunteers to come to the front of the class to lead various demonstrations, each followed by some additional instruction.
  - a. *How to carry and handle binoculars.* Pose each problem to the volunteer, then work together to demonstrate the solutions:
    - **Problem:** The case can be easily lost, soiled or damaged.

**Solution:** The case should be placed in a pocket or other safe place while the binoculars are in use.

- **Problem:** The binoculars could be dropped or laid down and become damaged or lost.

**Solution:** The strap should always be around the neck during use. When not around the neck, the binoculars should be put away in their case.

- **Problem:** The glass in the front and rear can become scratched or fingerprinted, which can damage the glass and cause blurry viewing.

**Solution:** The user must *never* touch either the front objectives including the glass at the front, the eyepieces or the glass in the back through which we look.

- **Problem:** The glass accidentally becomes dirty.

**Solution:** Bring the binoculars to the teacher for cleaning.

Note: Only special lens cleaning tissue or cloth should be used.

- **Problem:** The binoculars do not work properly or seem to be broken.  
**Solution:** Bring the binoculars to the teacher to examine.

- b. *How to hold binoculars.* Pose the problem to another volunteer, then work together to demonstrate the solution:

- **Problem:** Binoculars magnify *everything*, including our own hand movement, so it can be difficult to hold them steady enough to see the birds clearly.

**Solution:** If you must stand, hold the binoculars with thumbs and fingers from both sides, and tuck your elbows down so that they are pressing against each side of your stomach. This way, your body is working similar to a tripod. Better still, try sitting with your elbows braced against a table, ledge or window sill.

- c. *How to focus binoculars.* Pose each problem to another volunteer, then work together to demonstrate the solutions:

- **Problem:** The image in the binoculars does not look sharp.

**Solution:** While looking through the binoculars, use the index finger of each hand to reach over and slowly turn the focus wheel located in the center at the top of the binoculars until the image is sharp. Note that the minimum focus of these binoculars is approximately 20 feet. Anything closer than that cannot be brought into sharp focus.

- **Problem:** The image looks focused through one eyepiece, but looks out of focus in the other.

**Solution:** There is a diopter adjustment on the right eyepiece, which can be adjusted to match the sharpness in both the left and right eyepiece. This is designed to allow users to correct the differences that can exist between the vision in our two eyes, but for our purposes the diopter should always be set to “0” (zero).

**EXPLAIN    LOOKING SHARP**

1. Distribute a pair of binoculars to each student.
2. Instruct the students to each notice the number written on the outside of the binocular case, and then carefully remove the binoculars, laying the binoculars flat on their desk. The number on the case and the binoculars should match.
3. Explain that these will be their assigned binoculars for the entire project and that they will be responsible for taking care of them. The binoculars will be passed out before each feeder observation session and then collected for safe storage.
4. Instruct the students to place the cases on a corner of their desk and put the neck cord of their binoculars around their necks.
5. Instruct the students to report their assigned binocular number as you call on each student. Record these numbers next to each student's name on the Binocular Checkout Sheet. Later, the students may record their binocular number on the front cover of their Avian Explorer Handbook on the Student Journal side below their name.
6. Instruct the students to practice focusing their binoculars on different objects around the room.
7. Remind the students of two important pieces of information:
  - a. They need to be sure that the diopter on the right eyepiece is set to zero.
  - b. The minimum focus for these binoculars is approximately 20 feet. Anything closer will not come into proper focus.
8. Assist any students having difficulty getting their binoculars to focus properly.
9. Inform the students that in their next activity they will test their ability to focus binoculars properly. Encourage the students to speak up now if they are still uncertain about how to use their binoculars and address any problems.

**ELABORATE    BIRD WORD BINOCULARS PRACTICUM**

This activity involves the five research groups formed in Lesson 1 of Unit III.

1. Instruct the students to gather a pencil and a piece of scratch paper.
2. Explain the procedure for the activity:
  - a. Each of the five groups will take turns bringing their binoculars to the front of the classroom and stand with their backs against the wall facing the opposite side of the room.
  - b. The teacher will be standing at the opposite end of the room at least 30 feet away (approximately 12 normal adult steps), holding one of five Bird Word Cards. Each Bird Word Card has an illustration of a bird and bird-related word written in small font. The word on each card will be too small for the students to see with the naked eye, but they should be able use their binoculars to read them.
  - c. On your signal, you will hold up one of the Bird Word Cards and the students

in the first group should quietly focus their binoculars on the card, read it to themselves and then write the word on their piece of scratch paper. This should all happen with no talking.

- d. After each student has written the word on a piece of paper, he or she should silently return to their seat.
  - e. This same procedure will repeat for the remaining groups, one group at a time, using a different Bird Word Card each time.
3. Invite the first group to come up and begin the activity.
  4. When you complete the activity, review the words from each Bird Word Card and resolve any problems that students are having with the binoculars.

**EXPLORE GETTING READY FOR THE NEXT STEP**

1. Remind the students of the hypothesis they have chosen to test (decided in Lesson 1). How will going out to watch the feeders help test their hypothesis? What kind of data do they need to collect?
2. Conduct a brief discussion to get the students thinking about how their feeder observation sessions will help test and determine if their hypothesis is correct.

**EXPLAIN RECORDING DATA FROM THEIR FEEDER OBSERVATION SESSIONS**

1. Remind the students that each group will only be watching one feeder (or ground) during each feeder observation session, but that they will get to observe a different feeder each time.
2. Explain to the students that they will be organizing the research data they collect in three different ways:
  - a. Feeder Observation Sheet which will be completed by each student during each feeder observation session;
  - b. Team Record Sheet, page 1 (inside cover) of the Student Reference Guide section of their Avian Explorer Handbook;
  - c. Master Observation Sheets which will be maintained by the teacher to show all the class data thus far.
3. THE FEEDER OBSERVATION SHEET
  - a. Explain that gathering data during each feeder observation session is the most important part of their research project, and this sheet will be where their data first gets recorded.
  - b. Hand out a copy of the Feeder Observation Sheet to each student. Note that each page is formatted to contain two Feeder Observation Sheets. This way only a half page is needed for each student during a single feeder observation session.
  - c. Explain that everyone on the team will make their own observations as they watch for birds at a feeder and record it on their own Feeder Observation Sheet. This way errors will be minimized.

- d. Review the sheet, clarifying what needs to be filled out and how to do so.
- e. Explain that after each feeder observation session, the group will assemble back in the classroom and compare findings using this form.
- f. A new Feeder Observation Sheet will be filled out during each feeder observation session.

#### 4. THE TEAM REPORT

- a. Direct the students' attention to the "Team Total" boxes on the Feeder Observation Sheet. Explain that since it is very possible that members of the same group will sometimes record slightly different information during their observations, they will need to turn in an "official report."
  - Each observation group will create the "official report" by filling in the Team Total boxes on his or her own Feeder Observation Sheet and then comparing their results with the other group members.
- b. How will the Team Captain choose what to put in each Team Total box if there are discrepancies? That will be partly left up to the group to work out, but to start the process they should do the following:
  - Determine if any one group member's data should be thrown out because that person was distracted during the observation or if they realized a mistake was made.
  - If half or more of the group has recorded the same data, that is what should go in the Team Total boxes.
  - If fewer than half have recorded the same information, the group should discuss why this may have happened and think about how to improve their accuracy. Then, they should either report whatever was reported by the most people *or* report an average of each person's data.
- c. When the Team Total boxes are complete, the Team Captain should turn in his or her Feeder Observation Sheet as the official Team Report to the teacher.

#### 5. THE AVIAN EXPLORER HANDBOOK

- a. Explain that if they have not already, they will each receive a Unit III Avian Explorer Handbook. On the inside cover, or page 1 of the Student Reference Guide section, titled "Team Record Sheet," students should write the date, feeder type and number of each bird species that the group observed during each feeder observation session.
- b. Explain that their handbooks will also contain their own personal field guide to the same birds shown on the Feather Friends Field Guide Posters.

#### 6. THE MASTER OBSERVATION SHEET

- a. Present these forms to the students.
- b. These five forms will be used primarily by the teacher to compile data from the Team Reports turned in after each feeder observation session. Each sheet will display data from one particular feeder (or ground) and will help the

students track and appreciate the progress of their research during the study.

- c. Explain how at the end of their study the class will be able to use the data on these sheets to analyze the results of their study, form a conclusion about their hypothesis and prepare their reports.

**ENGAGE GETTING READY FOR THE NEXT STEP**

Suggest to the students that it would be a good idea to visit their feeder observation area and perform a practice feeder observation session. But before that happens there is just one more discussion they need to have to help everything go smoothly...

**EXPLORE WHAT SHOULD BE OUR FEEDER WATCH GUIDELINES?**

1. Ask the students what guidelines they should have for going to the feeder watch observation area.
2. Facilitate a short discussion in which the students consider proper behaviors that will not scare the birds away and that will make the best use of their time.

**EXPLAIN FEEDER WATCH GUIDELINES**

Summarize guidelines for the feeder observation sessions, such as:

1. Before leaving the classroom everyone should gather all materials needed for the observation session. This includes a pencil, clipboard, data sheet and binoculars. The Team Captain should be responsible for taking their group's Feathered Friends Field Guide Poster.
2. Groups will be assigned to observe a certain feeder type before leaving the classroom.
3. Students will line up by research groups to walk quietly to the feeder observation area.
4. Students should move slowly and speak in a whisper during the entire observation session and wait quietly for instructions.

**ELABORATE A PRACTICE FEEDER OBSERVATION SESSION**

1. Distribute or direct the students to gather their research materials: pencil, clipboard, data sheet and binoculars and a Feathered Friends Field Guide Poster carried by each Team Captain.
2. Remind the students that their feeder observation area has five different feeders to be observed, A, B, C, D and G. A through D are the four feeders and G refers to the ground beneath all the feeders. Assign each group to a feeder for this practice session.
3. Direct the students to line up by groups at the door and then depart for the observation area.
4. At the feeder observation area, help the groups get situated for their observations, making sure that everyone has a good view of both their assigned feeder and their group's Feathered Friends Field Guide Poster.

5. Conduct the observation session.

**EXPLAIN**

**DEBRIEFING THE PRACTICE FEEDER OBSERVATION SESSION**

1. Assemble the students by groups back in the classroom.
2. Begin the debriefing by asking the students to evaluate the experience. What went well? What should be changed or improved?
3. Help the students complete their post-observation tasks:
  - a. Gather as a team to review data recorded on their individual Feeder Observation Sheets.
  - b. Work with the Team Captain to decide on final data for the Team Totals for both bird species and total number of birds on their feeder.
  - c. At this point, they would turn in the Team Captain's Feeder Observation Sheet as the Team Report to the teacher for recording onto the Master Observation Sheets. However, this step can be omitted for the practice run.

**ELABORATE**

**THE AVIAN EXPLORER HANDBOOK**

1. Distribute an Avian Explorer Handbook to each student and remind everyone to complete the identification information on the front cover.
2. Show the students where they will be accumulating their own groups' record of data on page 1, Team Record Sheet, once they begin the official data collection.
3. On page 2, My Schoolyard Research Project, have the students write their class hypothesis. Conclusions will be recorded later. Let the students visit their observation site and sketch the feeders and ground below. Collect the handbooks when the students have finished.

**TEACHER  
NOTE**

Before students begin their official data collection, fill each feeder completely and record the total amount of food used on the Bird Food Log Sheet.

## **Appendix**

*Binocular Checkout Sheet*

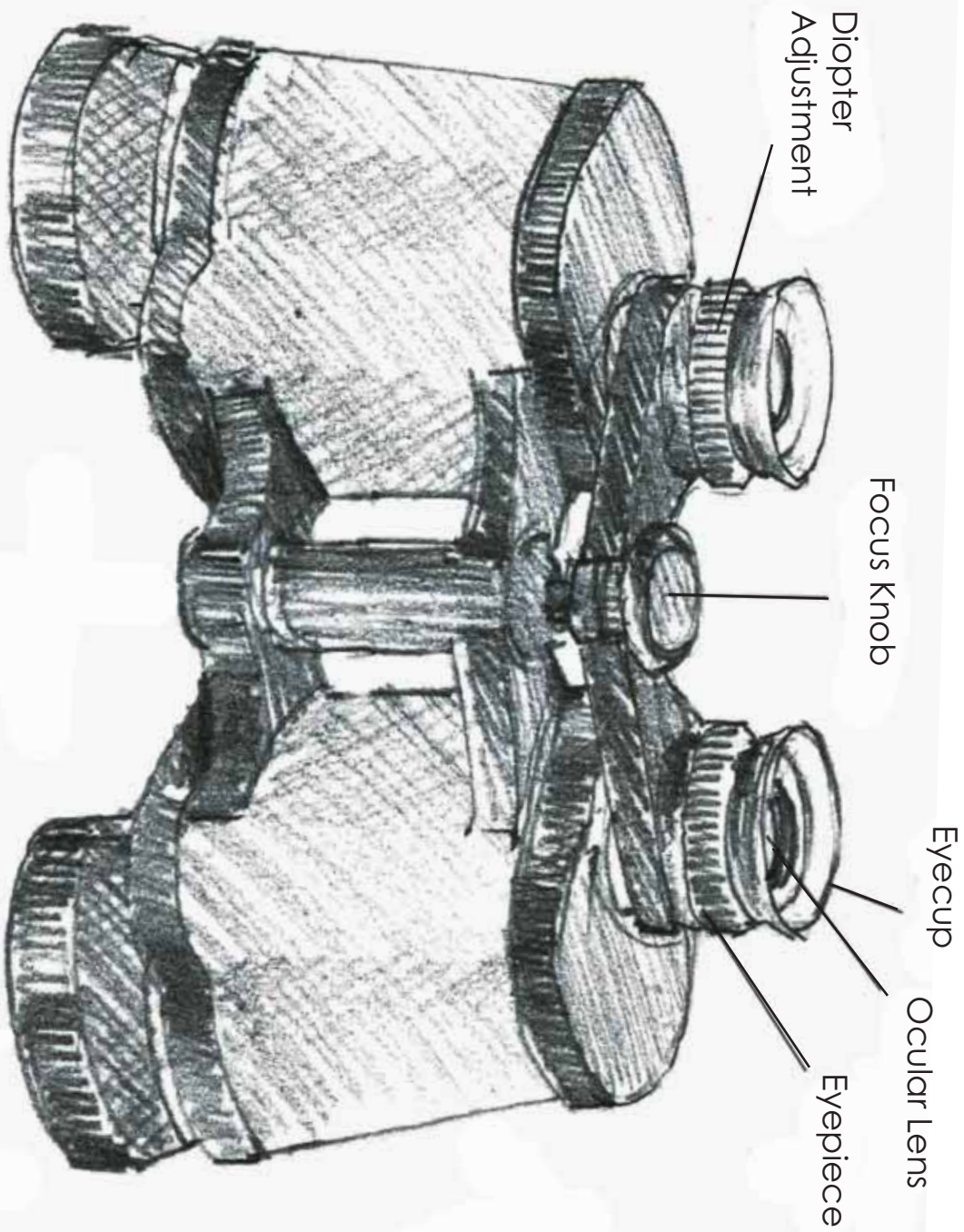
*An Introduction to Binoculars*

*Bird Word Cards*

*Bird Food Log Sheet*



# An Introduction to Binoculars





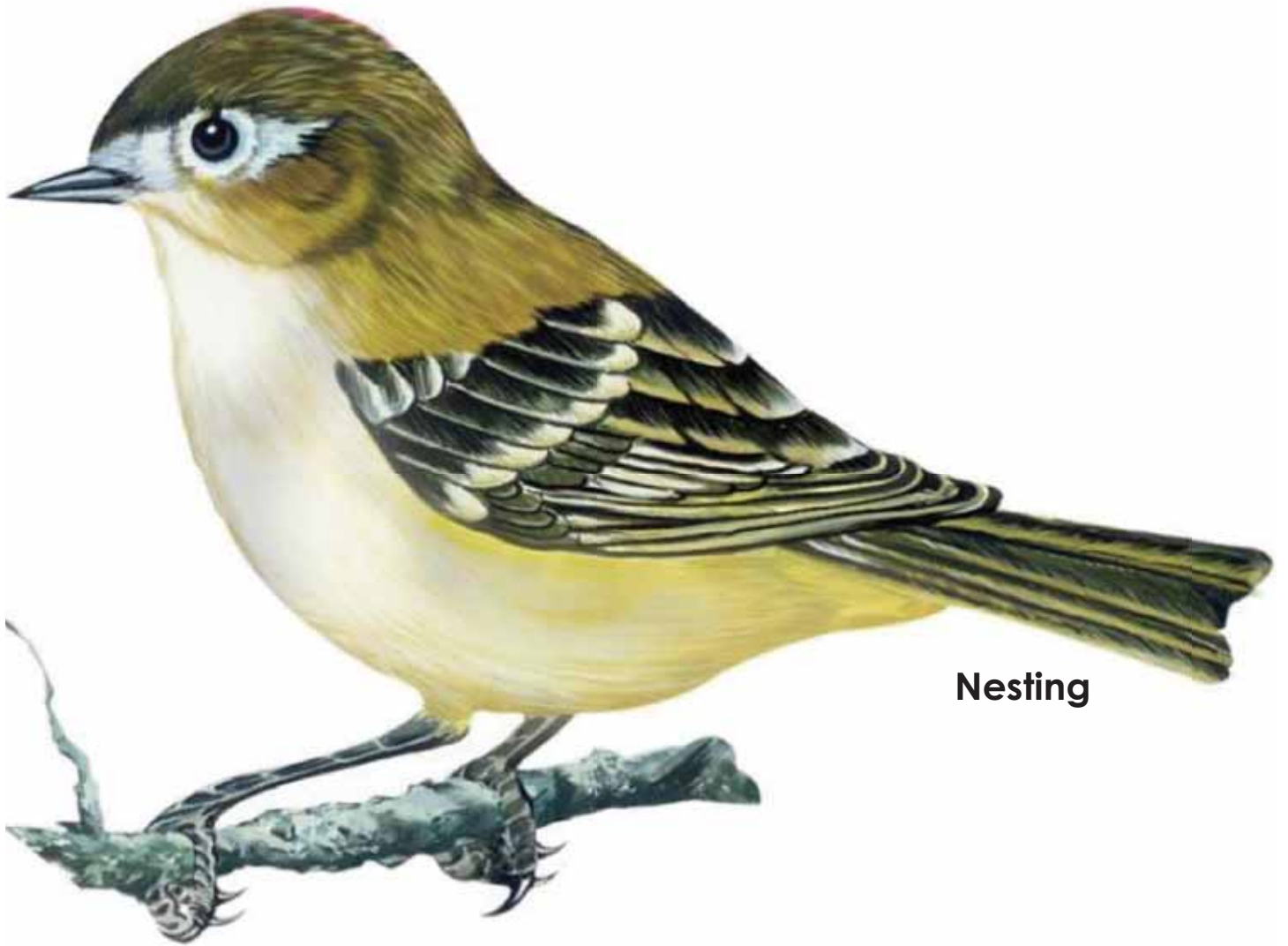
Feather



Species



Feeder



**Nesting**



**Aviary**

