

Unit III Lesson 4

Schoolyard Feeder Research Data Analysis & Conclusion

OBJECTIVES

Students will...

1. Deduce a variety of information from collected classroom data.
2. Form a conclusion about their class hypothesis.

DURATION

45 minutes

MATERIALS

1. Five sets of the five completed Master Observation Sheets
2. Scientific Method Arrow Cutouts or the Scientific Method Diagram (See Lesson 1 Appendix)

ADVANCE PREPARATIONS

1. Prepare five copies of each completed Master Observation Sheet, one set per research group.

AVIAN EXPLORER HANDBOOK

PAGES TO BE USED IN THIS LESSON

1. Student Journal Page
 - Page 5, Bird Words
2. Student Reference Guide Page
 - Page 2, My Schoolyard Research Project

VOCABULARY

WORDS & PHRASES USED IN THIS LESSON

A glossary of vocabulary relevant to the entire AVES Project is included in the Student Reference Guide section of the Avian Explorer Handbook. The list below shows the words that appear in this lesson. Any words defined in this lesson are shown in **bold**, both below and in the lesson text.

experiment

scientific method

Instructional Sequence

ENGAGE HOW FAR WE HAVE COME!

1. Suggest to the students that it is time for a small celebration. They have done their series of feeder observation sessions and now they get to take a look at the results.
2. Remind the students of the important steps they have completed in the scientific method to get where they are. As you do so, use the Scientific Method Arrow Cutouts or the Scientific Method Diagram from the Appendix of Lesson 1, or simply make a list on the board. Briefly review what took place in each step.
 - **STEP ONE: ASK A QUESTION**
First, they came up with different questions about birds involving the four feeder types (and ground) and the four different bird food types.
 - **STEP TWO: BUILD A HYPOTHESIS**
Next, they reviewed their collection of questions and chose one from which to build their hypothesis. Ask a volunteer to remind everyone of their class hypothesis and write it on the board.
 - **STEP THREE: DESIGN AN EXPERIMENT**
They designed a bird feeder experiment to test their hypothesis.
 - **STEP FOUR: COLLECT DATA**
They made a series of scheduled feeder observation sessions and recorded the information on their Feeder Observation Sheets.
3. Remind the students that this brings them to the present; they have finished *collecting* data. What is the next step?
It's time to move on to the fifth step of the scientific method: Analyze the Results

EXPLORE STEP FIVE OF THE SCIENTIFIC METHOD: WHAT DOES OUR DATA TELL US?

1. Ask the students to suggest what it means to “Analyze the Results.”
Explain as needed that analyzing results is looking at the data that was collected during the experiment and figuring out what that information means.
2. Provide one example by describing how some specific data from their study provides a piece of new information about birds, food and feeders.
3. Describe the procedure for the next activity:
 - a. Students will gather into their five research groups. Each Team Captain will receive a set of the five completed Master Observation Sheets.
 - b. Each group will take a few minutes to look at all the data, and then discuss what various things the data might be telling them (their analysis need not apply to their hypothesis). For example, based on the data they gathered, what might they be able to conclude about...
 - The popularity of the different bird foods or feeder types? Which food types or feeder types were visited by the most birds?
 - Connections between certain bird species and kinds of bird food or feeder

types? Were certain bird species more commonly seen on certain feeder types or eating certain food types?

- Trends or changes in what was observed between the beginning of the experiment and the end?
- Other possible conclusions based on their data?

c. Although they might find themselves interpreting a variety of things from their data, each group should agree on just one observation or interpretation to share with the class.

4. Begin the activity.

EXPLAIN SUMMARIZE DATA ANALYSIS

1. Invite the groups to take turns presenting their data interpretations by building a list on the board for discussion.
2. Review the classroom list on the board. Correct any misconceptions and add any other important observations or interpretations the groups might have missed from the data.
3. Conclude by reemphasizing how much information can be drawn from the data from this one experiment.

EXPLORE STEP SIX OF THE SCIENTIFIC METHOD: FORM A CONCLUSION ABOUT THE HYPOTHESIS

1. Remind the students that the sixth step of the scientific method is to “Form a Conclusion about the Hypothesis.” The students might very well have already brought up their class hypothesis during the previous discussion, but now is the time to conclude specifically about whether the class hypothesis was true or not.
2. Discuss with the students whether the data supports or disproves their hypothesis, considering these points:
 - What data specifically supports or disproves the hypothesis?
 - Are there other factors that could explain their data besides, or in addition to, the explanation provided by their hypothesis?
 - If there is uncertainty, what could be done to draw a more definite conclusion?

EXPLAIN FORM A CONCLUSION ABOUT THE CLASS HYPOTHESIS

1. Summarize the previous discussion and help the students reach a consensus.
2. Reemphasize that all experiments are successful whenever they provide information that was not known before. Whether the hypothesis was correct or not is much less important than the new knowledge gained and the opportunities this knowledge presents for designing a new experiment.
3. Distribute the students’ Unit III Avian Explorer Handbooks and instruct them to complete the sentence on page 2 in the Student Reference Guide section that begins, “Our conclusion is...”
4. Set up anticipation for the next lesson in which they move from today’s conclusion to a formal classroom presentation to show what they’ve learned from their research.

ELABORATE AVIAN EXPLORER HANDBOOK ASSESSMENT PAGE

Within the next few days, direct the students to complete the following pages in the Student Journal Section of their Avian Explorers Handbooks.

1. Page 5, Bird Words