# Activity #8: *The Tale of Chipilo*
# Analyzing Scientific Data

The table below shows a representative sampling of Golden-cheeked Warbler nests studied in 2008 on a site in the Texas Hill Country. Review the table below. Then answer the questions that follow.

A ***nestling*** is a young bird *in the nest.*
A ***fledgling*** is a young bird that has *just left the nest.*

| Nest # | Number of Eggs | Number of Nestlings | Number of Fledglings | Nest Height (meters) | Nesting Tree Type |
|---|---|---|---|---|---|
| 1 | 4 | 4 | 4 | 6 | Ashe juniper |
| 2 | 4 | 4 | 0 | 6 | Ashe juniper |
| 3 | 3 | 3 | 3 | 3 | Shin oak |
| 4 | 3 | 0 | 0 | 4.5 | Ashe juniper |
| 5 | 3 | 0 | 0 | 4 | Ashe juniper |
| 6 | 3 | 3 | 3 | 5 | Ashe juniper |
| 7 | 4 | 4 | 4 | 5 | Texas red oak |
| 8 | 4 | 4 | 0 | 5 | Ashe juniper |
| 9 | 2 | 0 | 0 | 6 | Ashe juniper |
| 10 | 4 | 4 | 4 | 5 | Ashe juniper |
| 11 | 1 | 0 | 0 | 6 | Ashe juniper |
| 12 | 4 | 4 | 4 | 6 | Ashe juniper |

1. What might be a good title for this table?
   a) The Golden-cheeked Warbler and Nest Graph
   b) 2008 Nesting Site Information on the Golden-cheeked Warbler in the Texas Hill Country
   c) Golden-cheeked Warbler Nests in the Texas Hill Country
   d) How Many Golden-cheeked Warblers Survive in a Nest?

2. The most frequent nest tree type for a Golden-cheeked Warbler in this study is:
   a) shin oak
   b) cedar elm
   c) Texas red oak
   d) Ashe juniper

3) Define “mean”:_____

Without using any numbers, explain how you would calculate the mean:

_____

_____

4) Define “median”:_____

Without using any numbers, explain how you would calculate the median:

_____

_____

5) Define “mode”:_____

Without using any numbers, explain how you would calculate the mode:

_____

_____

6) **On a separate sheet of paper**, calculate the answers for the chart below, rounding your answers to the hundredth’s place. Be sure to show your work. Record your answers in the table below.

| | Mean | Median | Mode |
|---|---|---|---|
| Number of eggs | | | |
| Number of nestlings | | | |
| Number of fledglings | | | |
| Nest Height | | | |

7) What would the mean nest height be in *centimeters*? _____

8) About how tall would the mean nest height be in *feet*? _____

9) What percentage of Golden-cheeked Warblers survive to the nestling stage? _____

$$\%\ \text{GCWA surviving from egg to nestling} = \frac{\text{Total number of nestlings}}{\text{Total number of eggs}} \times 100$$

10) What percentage of Golden-cheeked Warblers survive to the fledgling stage? _____

$$\%\ \text{GCWA surviving from egg to fledgling} = \frac{\text{Total number of fledglings}}{\text{Total number of eggs}} \times 100$$

11) If a Golden-cheeked Warbler manages to survive to the nestling stage, what is its percent survival to the fledgling stage?_____

$$\%\ \text{GCWA survival from nestling to fledgling} = \frac{\text{Total number of fledglings}}{\text{Total number of nestlings}} \times 100$$

12) A wildlife biologist is interested in finding out if Golden-cheeked Warblers nesting six meters high in a tree have a greater survival rate than birds nesting less than six meters. Based on the table of data you have, do you think nest height is a major factor in the survival of the Golden-cheeked Warbler from egg to fledgling? Why or why not? Use complete sentences and data to explain your reasons.

13) What questions related to Golden-cheeked Warblers might you have based on this table and the work you've completed? Use complete sentences.

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**Answer Key Activity #8: *The Tale of Chipilo*−Analyzing Scientific Data**

1) What might be a good title for this table?
   a) The Golden-cheeked Warbler and Nest Graph
   **b) 2008 Nesting Site Information on the Golden-cheeked Warbler in the Texas Hill Country**
   c) Golden-cheeked Warbler Nests in the Texas Hill Country
   d) How Many Golden-cheeked Warblers Survive in a Nest?

2) The most frequent nest tree type for a Golden-cheeked Warbler in this study is:
   a) shin oak
   b) cedar elm
   c) Texas red oak
   **d) Ashe juniper**

3) Define "mean": the average of a set of numbers
Without using any numbers, explain how you would calculate the mean:
Add up all the numbers in a set and divide that sum by the total number of numbers in the set

4) Define "median": the number in the middle of a given set of numbers
Without using any numbers, explain how you would find the median:
Place the numbers in numerical order. The number in the middle of the sequence is the median, or the average of the two middle numbers if there are two.

5) Define "mode": the most frequently occurring number in a set
Without using any numbers, explain how you would find the mode:
Place the numbers in numerical order and find the one that occurs most frequently

6)

| | Mean | Median | Mode |
|---|---|---|---|
| Number of eggs | **3.25** | **3.50** | **4.00** |
| Number of nestlings | **2.36** | **3.00** | **4.00** |
| Number of fledglings | **1.83** | **1.50** | **0.00** |
| Nest Height (m) | **5.13** | **5.00** | **6.00** |

7) What would the mean nest height be in *centimeters*? 513 cm

8) About how tall would the mean nest height be in *feet*? over 15 ft

9) What percentage of Golden-cheeked Warblers survive to the nestling stage? 30/39 x 100 = 76.92%

10) What percentage of Golden-cheeked Warblers survive to the fledgling stage? 22/39 x 100 = 56.41%

11) If a Golden-cheeked Warbler manages to survive to the nestling stage, what is its percent survival to the fledgling stage? 22/30 x 100 = 73.33%

12) *Question 12 can either be assigned or discussed orally to come up with the answers:*

The survival rate for warblers nesting six meters high in a tree is 53.3% (8 fledglings/15 eggs x 100). It is slightly lower than the overall survival rate. In nesting sites less than 6 meters, the survival rate is actually slightly higher (14 fledglings/24 eggs x 100) at 58.33%. From this I conclude that the data does not support tree height as being a major factor in the survival of the Golden-cheeked Warbler from the egg to the fledgling stage.

13) What questions related to Golden-cheeked Warblers might you have based on this table and the work you've completed? Use complete sentences.

- Why do so many not survive?
- What are the Golden-cheeked Warbler's predators?
- What other problems might affect survival rate? (e.g., weather, rain, drought, availability of food sources, destruction of habitat)

**Alignment:**

Grade 3 (red) Grade 4 (blue) Grade 5 (green) Grade 6 (purple)

English Language Arts & Reading student expectations: 3(A), 4(A,B), 15(B), 22(A-C), 23(A-D), 24(A-F); 1, 2(A,B), 13(B), 20(A-C), 21(A-C), 22(A-C); 1, 2(A,B), 13(B), 20(A-C), 21(A-C). 22(A-D); 1, 2(A,B), 12(B), 19(A-C), 20(A-C), 21(A,B)
Mathematics student expectations: 1(A,B), 5(A,B), 16(A,B); 1(A,B), 4(D,E), 5(A,B), 16(A,B); 1(A,B), 3(A-C), 4, 12(B), 13(B), 16(A,B); 1(A-C), 2(D), 10(B,D), 11(A), 13(A,B)
Science student expectations: 3(A,D), 9(A); 2(D), 3(A,D); 2(D), 3(A,D), 9(A); 2(E), 3(A,D), 12(E,F)
Social studies student expectations: 17(B,C,E), 18(C); 21(A-C,D), 22(A, C-E); 24(A-C), 25(A,D,E); 3(A,B), 21(A-C,F), 22(A,D,E)



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