

NAME: _____ DATE: _____ CLASS PERIOD: _____

Warm-Up: What is the plaintext message encoded in this cipher?

CBJXIBP PFKD

HINT: P = S

ENCIPHER ALGORITHM

-3 X Y Z A B C D E F G H I J K L M N O P Q R S T U V W

-2 Y Z A B C D E F G H I J K L M N O P Q R S T U V W X

-1 Z A B C D E F G H I J K L M N O P Q R S T U V W X Y

0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

+1 B C D E F G H I J K L M N O P Q R S T U V W X Y Z A

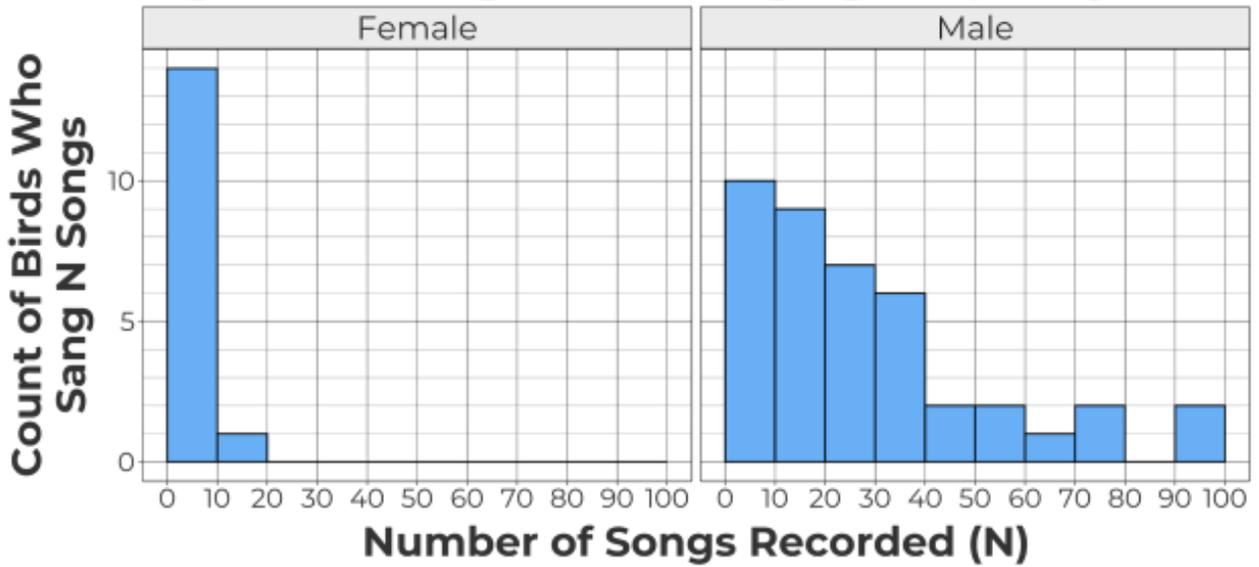
II Pause when you are done and wait for instructions from your teacher.

Task #1 Fill out Table 2 when you are prompted by your teacher.

Table 2: Binned song counts for each sex		
Bin: Song counts	Number of female birds that sang this many songs	Number of male birds that sang this many songs
0-10		
11-20		
21-30		
31-40		
41-50		
51-60		
61-70		
71-80		
81-90		
91-100		

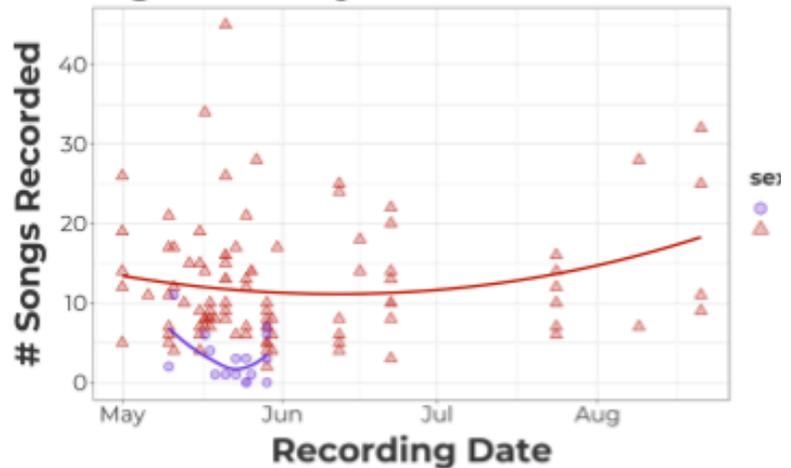
Task #2 The histogram for males has been completed for you. Compare the male values in Table 2 to the histogram in Figure 2 to make sure you understand how the numbers are shown in the graph. **Then draw the histogram for females.**

Figure 2. Histograms of Singing Output by Sex



Task #3 Figures 1 and 2 show different ways to visualize the same data. Compare how the data is shown in the two graphs. Then **complete the key by drawing the appropriate symbol (triangle or circle) next to each sex.**

Figure 1. A Mysterious Scatter Plot



Task #4 Which of these statements *best* explains how you knew which set of points belonged to each sex in the scatter plot?

- a) Males had to be circles because in Figure 2, males had a lot more songs recorded and there are a lot more circles than triangles in Figure 1
- b) Females had to be circles because in Figure 2, most females sang 0-10 songs, and the purple circles are mostly below 10 songs in Figure 1
- c) Males had to be triangles because in Figure 2, no males sang more than 20 songs

Task #5 What information does the deciphered Figure 1 (a scatter plot) tell you that Figure 2 (the histograms) do not? (hint: read the X-axis labels)

Task #6 Now that you have looked at the singing data as a scatter plot and as a histogram, do you agree with the anonymous scientist who suggested that a histogram is a better choice to tell the data's story? Would any information be gained or lost by choosing a histogram over the scatter plot? (Hint: compare the x-axis in both figures).

Task #7 Consider these facts:

- Until recently, many people (scientists included) assumed that females did not sing in most North American bird species
- Male and female barn swallows look similar to the untrained eye

Why do you think female barn swallow song was ignored until 2020? (Hint: Use the facts above and the scatter plots to explain how a scientist might not notice that female birds sing.)

Task #8 Consider these facts:

- Female barn swallows spend a lot of time incubating their eggs (keeping them warm) after they are laid in May.
- Males in this species spend much less (or no) time sitting on eggs.
- Predators may be attracted to prey by sounds.

Relate these facts to the pattern you found in the data. In other words, how do these facts help explain why females sing less than males?

BONUS CHALLENGE

#6269742e6c792f6770686935

This is called a **hexadecimal** number, a type of code used to store information in computers.

This code represents a secret web link. Here's how you decode it:

- 1) Type the code into an internet search field
- 2) Copy the code using Ctrl+C (PC) or Command+C (Mac)
- 3) Search for "hex to text converter" and go to the top result
- 4) Paste the code into the "Input" field with Ctrl+V (PC) or Command+V (Mac)
- 5) Switch to "Hex to Text" if "Text to Hex" is selected by default
- 6) Type "www." + the decoded text in the address bar (Hit enter)
- 7) You should get a rewarding surprise if you went to the right link.