

BIRD VARIATION AND NATURAL SELECTION LAB

In this lesson, you will assess the level of variation in one of two traits in birds (feather color or bill size). The objectives of the lesson are for you to:

- Increase awareness of the range of variation available for natural selection.
- Learn about how differences in traits among individuals can lead to differential survival and reproduction.
- Improve skills at observing and describing the natural world.

Photos of bird colors: http://csip.cornell.edu/Curriculum_Resources/CSIP/Ardia/color.html

Photos of beak size: http://csip.cornell.edu/Curriculum_Resources/CSIP/Ardia/bill.html

STATION 1 & 5: VARIATION IN COLOR (Northern Cardinals)

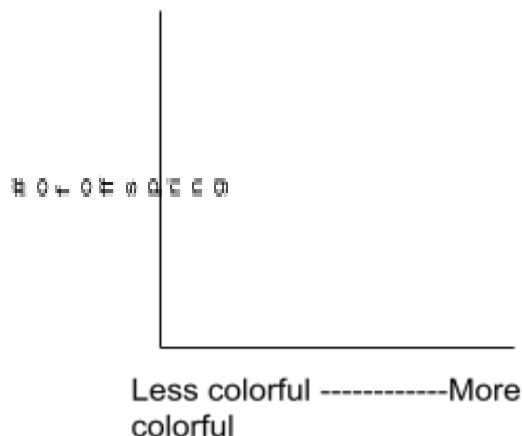
STATION 2 & 6: VARIATION IN COLOR (Summer Tanagers)

STATION 3 & 7: VARIATION IN COLOR (Scarlet Tanagers)

1. Determine which part of the bird you are going to measure; examine the link called “suggestions on where to measure” for ideas. It doesn’t matter which area you choose, just be consistent.
2. As a group, decide which color square from the template most closely matches the color on each bird (1-20). Remember, you are only concerned with the Northern Cardinal.
3. Record your choice in a data table.
4. Make a histogram of the # of birds with each color score in order to see the pattern of variation in color in the birds.

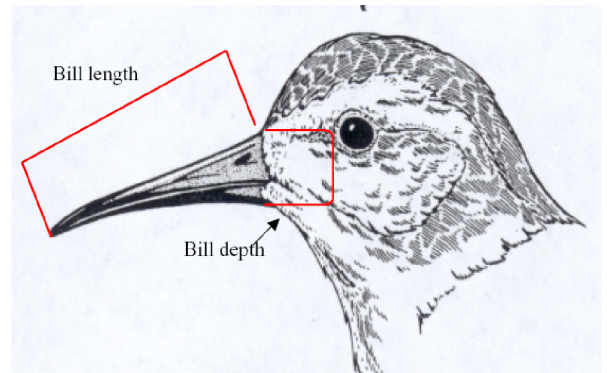
Answer the following questions based on your measurements

- Did you observe variation in the trait you measured? Explain the pattern.
- When we study natural selection, why might we care about variation?
- Scientists have measured the number of offspring that birds with different traits have produced. Do you think that birds of different colors produce different numbers of offspring? Draw a graph like the one below to show what you think might happen. Explain why you expect such a relationship (hint: there isn’t a right answer, it is just your hypothesis).



STATION 4 & 8: VARIATION IN BILL LENGTH (Northern Cardinal)

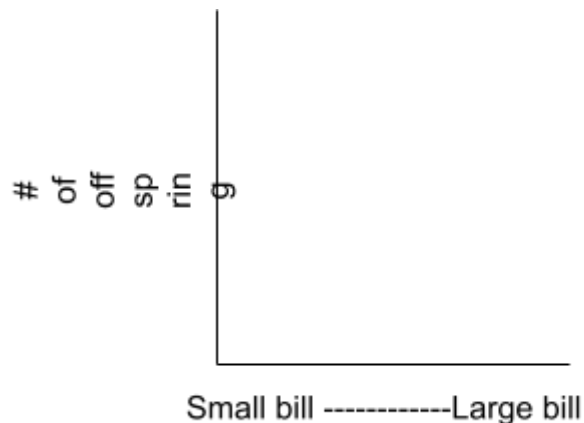
1. As a group, for each bird (1-20) measure the length of the beak in cm. Round to the nearest mm.
2. Record your measurements in a data table.
3. Make a line graph of the # of birds with each bill length order to see the pattern of variation in color in the birds.



How to measure bill morphology

Answer the following questions based on your measurements

- Did you observe variation in the trait you measured? Explain the pattern.
- When we study natural selection, why might we care about variation?
- Scientists have measured the number of offspring that birds with different traits have produced. Do you think that birds of different bill sizes produce different numbers of offspring? Draw a graph like the one below to show what you think might happen. Explain why you expect such a relationship (hint: there isn't a right answer, it is just your hypothesis).



Please complete the following for your bird data:

- A.** What is the mean of your data?
- B.** What is the SD of your data?
- C.** Add the mean to your graph as a vertical line.
- D.** Add the SD to your graph as a horizontal line.
- E.** Explain what a large or small SD means in relation to genetic variation.