

FLASHY FEATHERS



STUDENT WORKBOOK

LAUNCH



BEAUTIFUL BIRDS

You change your clothes. You change your hair. You change your mind. Change happens. Everything changes. Have you ever seen change happen in nature? Some changes happen quickly, while others happen more slowly. So, just how quickly do populations change over time?

AFRICAN STARLINGS

African Starlings and true sparrows are thought to be closely related.

AFRICAN STARLINGS GENUS



Onychognathus morio or Red-winged starling



Lamprotornis nitens or Cape starling



Cinnyricinclus leucogaster or Violet-backed starling

TRUE SPARROWS GENUS



Passer domesticus or House sparrows



Passer hispaniolensis or Spanish sparrow



Passer ammodendri or Saxaul sparrow

Most birds have only one or two types of structural colorations present. The genus of African Starlings (*Sturnidae*) is unique as it includes all four types, allowing for increased **genetic variation**. Genetic variation is the differences in DNA between organisms of the same species that occur when there is more than one observable trait within a population.



Notice how the genetic variation between the African Starlings is much more diverse than the variation between the true sparrows.

These differences are characteristics that impact the structure and function of organisms as **adaptations**. Adaptations are physical or behavioral characteristics that help an organism to survive in its environment. For example, toe arrangements on a bird's feet are a critical adaptation for survival as they impact function.



While there are five generally agreed upon toe arrangements in birds, African Starlings have an arrangement called anisodactyl, meaning that their feet have three digits facing forwards and one digit facing backwards. Anisodactyl feet are flexible because all four digits move independently. This allows the birds to perch while sleeping and grasp nesting materials during transport.

To better understand the adaptations of African Starlings we need to study the closely related fields of **physiology** and **morphology**. Physiology is the study of the functions of organisms, and morphology is the study of the relationships between the form and structures of organisms.

The Hoopoe Starling went extinct in the 1850s, but had anisodactyl feet.

SHOW WHAT YOU KNOW

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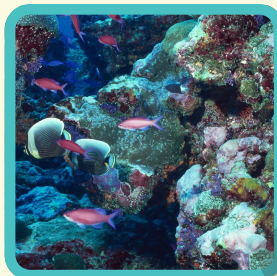


Individuals may pass down a recessive trait to their offspring, even if they do not express the phenotype for that trait. This can reduce the chances of survival of the offspring if the recessive trait makes them less suited their environment. It's crucial that organisms have the greatest **fitness**, or be the best adapted to their environment.

In the following ecosystems, determine an organism that has adaptations that would allow it to survive best in the given environmental conditions. Then, explain why the organism's physiology and morphology led you to that conclusion.



a. Desert



b. Ocean



c. Freshwater Lake



d. Tropical Forest



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Revision Date	12/2021