FLASHY FEATHERS

TEACHER GUIDE

LAUNCH

PLANNING

Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time.

ACTIVITY INFORMATION	SECTION (S)	TIME REQUIRED	DAY/ LESSON
ACTIVITY 1: BEAUTIFUL BIRDS Visualize how fast change can happen over time by comparing two genera of birds. **Total time: 30 min**	☐ African Starlings	30 minutes	Day 1
ACTIVITY 2: WHAT'S THE CHANCE? Use gaming to demonstrate how change happens over time. **Total time: 3 h 15 min**	☐ Change Over Time	60 minutes	Day 2
	☐ Out in Africa	45 minutes	Day 3
	☐ Show What You Know	45 minutes	Day 4
	☐ Math Time!	45 minutes	Day 5
ACTIVITY 3: LESS ISN'T ALWAYS MORE Discover how genetic variability impacts the survival of individuals and populations. **Total time: 1 h 30 min**	☐ Sensational Seeds	45 minutes	Day 6
ACTIVITY 4: NEIGHBORLY BRAWL Observe plants battling for resources. **Total time: 4 h 30 min**	☐ Duking It Out – Set Up	30 minutes	Day 7
ACTIVITY 3: LESS ISN'T ALWAYS MORE (CONTINUED)	☐ More Good, More Bad, More Ugly	45 minutes	Day 8
ACTIVITY 4: NEIGHBORLY BRAWL (CONTINUED)	☐ Interest		
	☐		

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CHANGE OVER TIME

PREPARATION AND SUPERVISION

- The average initial value of the cards for both versions is 5.5.
- The final average value for the African Starlings round hover around 7.5, while the average for the sparrows will remain around 5.5.
- If the final average values are closer together, help your student to recognize that the African Starlings coloration still changes quicker than the sparrows does.

MULTIPLE AGES AND ABILITIES:

If you are working with several students, you can have students take turns drawing 6 cards. You can also have one student do the African Starlings version of the game and the other do the true sparrows version. Then, students can observe the other completing their version and respond to the Think About It questions together.

THINK ABOUT IT!

Question 1: What happened to the coloration of the African Starlings' feathers and true sparrows feathers over time?
Answer: The African Starlings' feather coloration increased, meaning that they became more colorful. True sparrow feather coloration didn't change much over time.
How to Help: *The answer provided is what your student's game should have resulted in. However, if they did not, make sure their response matches their game and then encourage them to think about how the results of the game could have been different.*

Question 2: For the African Starlings, what type of coloration do you think your initial average reflected? What type of coloration do you think your final average reflected?
Answer: The initial average represents lesser variation in coloration, while the final average represents greater variation. Therefore, the initial population would be less colorful and dull, and the final population more colorful and vibrant.
How to Help: *You can talk through this with your student to remind them that the greater the value on a card, the more colorful. This means that as the average number rises, the overall population is going to have more colorful feathers.*

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OUT IN AFRICA

CONTENT

• In this section, your student will learn the following vocabulary terms: adaptation, genetic variation, inheritance, morphology, physiology, population, speciation.
• This section discusses structural colorations in African Starlings, but there are many types of animals with them. These complex structures are why butterflies have unique colorations and patterns on their wings. As a result, more and more brightly colored and interesting patterns may emerge in butterflies as those characteristics are passed on.

	F	F
f	Ff	Ff
f	Ff	Ff

	F	f
f	Ff	ff
f	Ff	ff

b. You are also looking at a white feathered female. What is her genotype?
Answer: ff
How to Help:
• *Having white feathers is the recessive trait, meaning that the bird needs two copies of the gene to express that trait.*
c. If the male black feathered bird mates with the white feathered female, what is the probability of their offspring having black feathers? What is the probability of their offspring having white feathers?
Answer: The probability of a black-feathered offspring is 50 % and the probability of having a white-feathered offspring is 50 %.
How to Help:

	F	f
f	Ff	ff
f	Ff	ff

activity 3

LESS ISN'T ALWAYS MORE

The traits passed down from parent to offspring can impact survival. Some offspring survive while others don't as a result of the traits passed down to them. Survival is key as this impacts the number of individuals within a population.

LEARNING GOALS:

- ✓ I can use mathematics to explain variation and distribution of expressed traits in a population.
- ✓ I can explain how heritable characteristics of biological populations change over time as a result of genetic variation, competition for resources, changes in the number of individuals, and varying rates of survival and reproduction.

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SENSATIONAL SEEDS

CONTENT

• Mutations do occur in nature, which is when there is a change in the nucleotide sequence of the genome of an organism. This can occur in many ways, and while not highlighted here, it can be an important discussion to have with your student in relation to that kit.

SAFETY: **WARNING! CHOKING HAZARD - Small parts. Not for children under 3 years..**

LAUNCH

SCIENCE UNLOCKED

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Kit	SU-FLASHY
Instructions	IN-FLASHYT
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