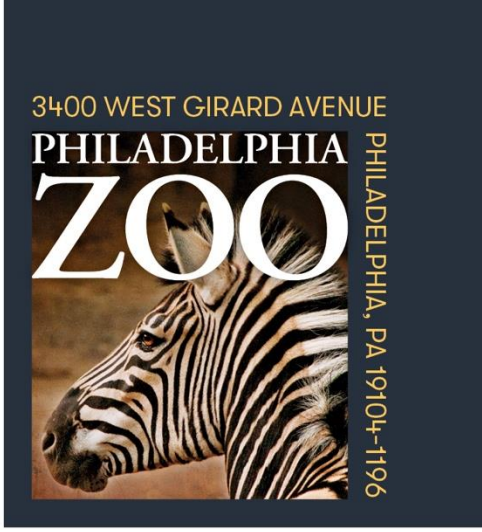
Characteristics of Life
9-12 Onsite Activity



Lesson Summary
Students observe and describe features of Zoo animals within the same species, compare and contrast these features, and determine what implications it might mean for genetic information.

Objectives
Students will be able to identify differences between individuals of a species
Students will be able to quantify the presence of specific traits in a population
Students will be able to hypothesize which of these features may be dominate, and which recessive genetically

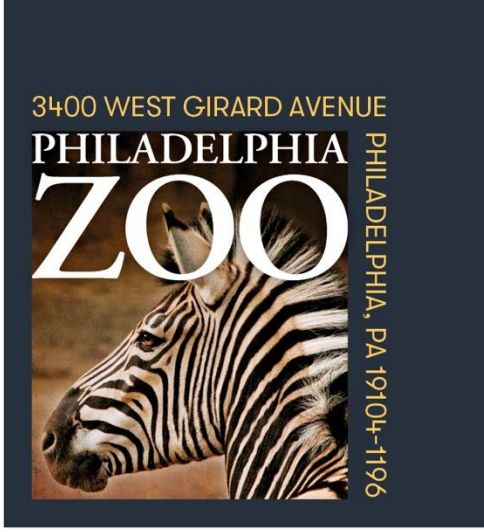
Essential Question
Why are living things similar or different from one another?

Materials
- Scrap Paper (or worksheet such as provided at the end of the lesson)
- Writing utensils

Prep
1. 1 Week before: Look at the Zoo map to determine locations for observations
2. 1 Day before: Print out worksheets as needed (1 for each student)
3. 15 minutes before: Prep students for expectations

Key Terms
- **Classification:** the assignment of organisms to groups that share characteristics
- **Taxonomy:** the system of organisms to categorizations based on shared characteristics and relation
- **Nonliving:** not having life
- **Living:** having life, able to breathe, eat, drink, move, grow, and reproduce
- **Cell:** the basic structural unit of all living things
- **Genes:** the basic unit of heredity that informs the expression of features for a living thing
- **Gene Pool:** the total genetic information of all individuals in a population
- **Dominant Gene:** a variant of a gene that expresses itself more strongly by itself than other versions
- **Recessive Gene:** a variant of a gene whose expression is masked in the presence of a dominant gene
- **Inherited trait:** a characteristic received through family genes
- **Acquired trait:** a characteristic caused by environmental factors (not transferred genetically)

Background
There are many ways in which organisms (living things) can be classified. This process involves grouping organisms together based on shared characteristics. Some of these characteristics might include habitat, presence of a backbone, food source, diet, how they move, etc. By observing these organisms and sorting through their similarities and differences, we gain a better understanding of them and their needs, and are therefore able to better work toward protecting and preserving all living things!



Implementation

1. Excite: Welcome the students to the Zoo! As you walk around the Zoo, verbally discuss some differentiation you notice between individuals of the same species. Are there noticeable differences?

2. Explore: Travel to the Kid Zoo U building to visit the Gouldian Finch exhibit. Initially ask the students to determine if they can see any noticeable differences between individuals. For this species, what are some things that seem to set the individuals apart and allow us to visually identify one from the other?

3. Explain: Remind students that although a species of animal has many shared features, each individual is has a unique set of genetic combinations and expressions. In some species, we may be able to visually see it more, such as with the Gouldian Finches.

4. Elaborate: While looking at the finches, invite the students to count how many differentiations in colors they are able to find. How many types of colors do they see on the wings? How many different types of colors do they see on the head? How many types of colors do they see on the beak?

5. Ask students to take a closer look specifically at the different head colors, counting how many birds exhibit each of the head colors they see. If possible, ask students to calculate the percentages of the number of finches that have each head color in this population.

6. Based on their findings, invite students to consider which head color gene they would hypothesize to be the dominant gene and which they would hypothesize to be the recessive gene. Why or why not?

7. Evaluate: Ask students to consider why genetic and individual differences might be important.

Curriculum References

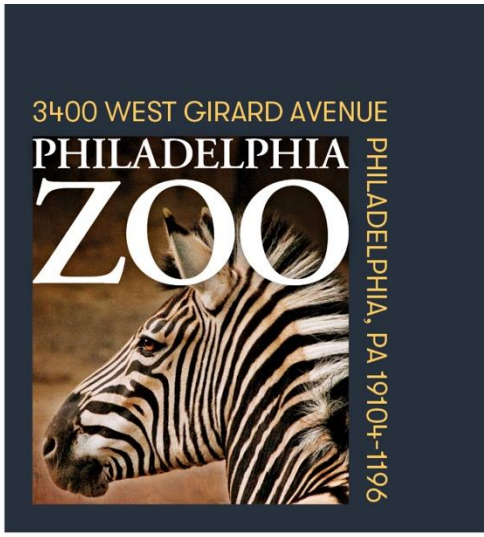
3.1.10.A1, 3.1.10.B1, 3.1.12.B1

Name: _____

Teacher: _____

School: _____

Date: _____



Welcome to the zoo! Head to KidZooU to visit with the Gouldian Finches. You'll see many of these colorful birds flying about the exhibit. Make some observations of these birds and share your findings below.

Gouldian Finches are a small, colorful bird found in Western Australia within the trees amongst the mangroves or savannas. These birds live in flocks, where several pairs may share a single hollow. Today it is estimated that that there are fewer than 2,500 mature Gouldian finches living in the wild. Fortunately, there are many breeding programs in places like Zoo to support their population!

How many different beak colors do you observe on the birds in the exhibit? _____

How many different chest colors do you observe on the birds in the exhibit? _____

How many different head colors do you observe on the birds in the exhibit? _____

Record the head colors that you see in the chat below. (The number of colors that you see may not fill out every row of the chart). Then count and record the number of birds that you see with that head color. Calculate the percentages of the number of finches that have each head color in this population.

Head color	Number of Finches Counted	Percentage of Population $\left(\frac{\#\ with\ specified\ color}{total\ number\ of\ finches} \times 100\right)$

Based on this population, which head color gene appears to be dominant? _____

Which head color gene appears to be recessive? _____

Why would genetic differences be important? _____

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