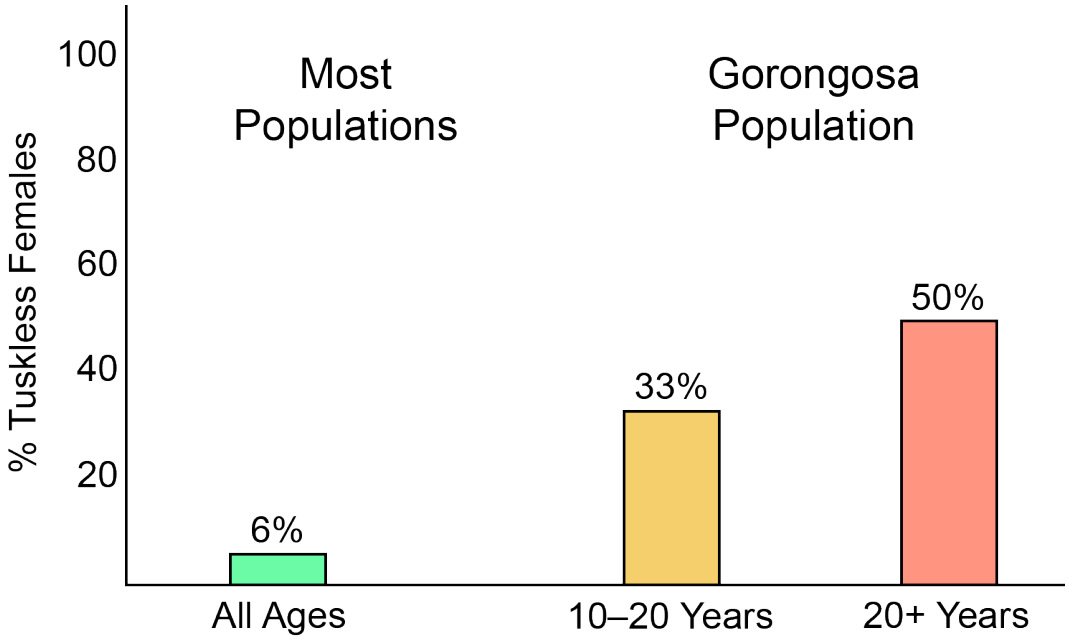
INTRODUCTION

Most African elephants have tusks, but typically about 6% of females in a population will never grow tusks. Adult males are very rarely found without tusks. However, in Gorongosa National Park in Mozambique, 50% of females over 20 years old are tuskless, and 33% of females between 10 and 20 years old are tuskless.



Why are there so many tuskless females in the Gorongosa elephant population? To answer this question, you will complete the following parts:

1. **Information Gathering**. To learn more about the problems facing African elephants and their recovery in Gorongosa National Park, watch these two BioInteractive *Scientists at Work* videos: the first minute of *The Great Elephant Census* and all of *Selection for Tuskless Elephants*. As you watch the videos, complete the questions from Part 1.
2. **Scientific Explanation of Evolution by Natural Selection**. Using a "Scientific Explanation of Evolution by Natural Selection" chart, construct an explanation for the high incidence of tusklessness in the Gorongosa elephant population.
3. **Argumentation**. Develop an argument to answer the question "Will the trend toward increased tusklessness in a population with heavy poaching lead to increased African elephant population sizes in the future?" The goal of this part is for you to make a prediction about the future of these populations using evidence and reasoning from the previous parts.

PART 1: Information Gathering

1. Look up the definition of the term *poaching* and summarize your understanding of what it means in the space below.

2. Watch the first minute of *The Great Elephant Census* and answer the following questions.

   a. What are the main threats to African elephant populations?

   b. The estimated rate of elephant loss is _____ elephants per day.

3. Research the location of the country of Mozambique. Draw an arrow pointing to Mozambique on the map.

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4. Watch the entire *Selection for Tuskless Elephants* video and answer the following questions.

   a. Joyce Poole is an expert in _____.

   b. What happened in Mozambique between 1977 and 1992? How did this event affect the size of Gorongosa National Park's elephant population?

   c. What is unusual about the elephant populations found in Gorongosa now?

   d. What are tusks? How does an elephant use its tusks?

   e. What would probably happen to a male elephant that doesn't have tusks?

      Therefore, tusklessness in male elephants is a _____ (rare/common) trait.

   f. What percentage of females are typically tuskless in an elephant population less affected by poaching?

   g. Tusklessness is an _____ (inherited/acquired) trait. Tuskless females tend to have _____ (tusked/tuskless) offspring.

   h. Why were elephants with tusks targeted during the civil war in Mozambique?

i. What percentage of female elephants were tuskless in Gorongosa according to Poole's surveys? Write your answers in the table below.

	Civil War Survivors (20+ years old)	Offspring of Civil War Survivors (10-20 years old)
% tuskless females		

j. How many adult males without tusks have been found in Gorongosa National Park? _____

k. Is the link between heavy poaching and a high incidence of tuskless females unique to Gorongosa? Cite evidence to support your response.

PART 2: Scientific Explanation of Evolution by Natural Selection

5. Write an explanation based on natural selection for the high incidence of tusklessness among female elephants in Gorongosa. Like all good scientific explanations, your explanation should include a *claim*, supporting *evidence*, and scientific *reasoning* to link the evidence to the claim. Use the **Scientific Explanation of Evolution by Natural Selection** chart below and on the next page to organize the information you will use in your explanation**.**

Condition	Description	Evidence
Variation	Individuals in a population or group differ in some trait of interest.	
Inheritance	The variation in the trait of interest is at least partially inherited (passed from parents to offspring). The variation stems from random mutations and the recombination that accompanies sexual reproduction. The genetic variation may have arisen many generations in the past.	
Differential survival and reproduction	More offspring are born than can survive, resulting in competition among individuals within a population. Some individuals with a particular trait are more likely to survive and/or have relatively more offspring compared to individuals that do not have that trait. Selection depends on the specific context of a species. Traits that are	

	beneficial in one environment may cause problems in another environment.	
Adaptation	The frequency of the trait that helps individuals survive or leave more offspring will increase in the population over time, as will the frequency of the alleles that affect the trait. This process can take many generations and extend over very long periods of time.	

PART 3: Argumentation

6. Develop an argument to answer the following question:

   Will the trend toward an increased incidence of tusklessness in a population with heavy poaching lead to increased African elephant population sizes in the future?

Your argument should be 1 or 2 paragraphs in length. Like a scientific explanation, a strong argument includes a *claim* with supporting *evidence* and scientific *reasoning*. The argument may also address weaknesses in alternative claims.

Keep in mind that there may be more than one plausible argument. The goal of this task is to provide a strong, convincing explanation supported by relevant evidence, logical scientific reasoning, and current knowledge about elephants.