

Skittles Population Bottlenecking Game

In your table you have a bag of skittles, each skittle representing an allele in a population and each color represent different alleles. You'll also need 2 differing coins, say a penny and a nickel.

1. In your bag, count the population and calculate the allele frequencies (% of the total population). This is the original population.
2. Put the skittles in the bottle and give it a good shake.
3. Imagining a disaster causes a massive drop in population. Only 5 alleles survive! Pour 5 alleles through the bottleneck. This is the survivor population.
4. Calculate the allele frequencies of the survivor population. How do these allele frequencies differ from those in the original population?
5. Take an allele from the survivor population and remove it from the group (it died). Flip the penny and the nickel and put the appropriate number of the same allele in a separate pile. These alleles represent the offspring survivor population.
 - Penny Heads, Nickel Heads: Add 3 of the same allele
 - Penny Heads, Nickel Tails: Add 2 of the same allele,
 - Penny Tails, Nickel Heads: Add 1 of the same allele,
 - Penny Tails, Nickel Tails: Add none (allele failed to reproduce).

When all of the original survivor alleles have died, repeat step 5 three times using the offspring survivor population. Calculate the allele frequencies at each step.

Repeat this again to simulate another disaster scenario.

- Compare the allele frequencies now with those in the original population before any bottlenecks were experienced.
- How does population bottlenecking influence genetic diversity?



The TASC Transition curriculum is a collaborative project of the New York State Education Department and the Queens Borough Public Library, supported by funding from the New York State Department of Labor.

Allele Disaster Worksheets

Disaster #1

Population	Alleles:	Red	Yellow	Orange	Green	Purple	Total
Original	Count:						
	Percent:						100%
Survivor	Count:						5
	Percent:						100%
Offspring 1	Count:						
	Percent:						100%
Offspring 2	Count:						
	Percent:						100%
Offspring 3	Count:						
	Percent:						100%

Disaster #2

Population	Alleles:	Red	Yellow	Orange	Green	Purple	Total
Original	Count:						
	Percent:						100%
Survivor	Count:						5
	Percent:						100%
Offspring 1	Count:						
	Percent:						100%
Offspring 2	Count:						
	Percent:						100%
Offspring 3	Count:						
	Percent:						100%



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