

ACTIVITY NO. – 9- Let's explore how we evolve!

Subject	Science
Class	X
Chapter/Unit	Heredity and Evolution
Topic	Genetic Drift
Time	40 min
Nature of Activity	Group

What will I learn (Learning Outcome)?

Students will develop the concept of Genetic Drift

Skills: Analyzing and Creating

What I have to do? To perform an activity with coloured paper beads (representing alleles) to understand how genetic drift can lead to the rise of new species.

What do I require? Paper cups, Beads with yellow and green colour

What do I need to know?

- Genetic drift is a mechanism of evolution in which allele frequencies of a population change over generations due to chance.
- Genetic drift occurs in all populations of non-infinite size, but its effects are strongest in small populations.

➤ Teacher's Activity

Teacher will-

1. explain the concept of genetic drift
2. arrange materials for the activity
3. divide the students in to groups
4. give instructions for the activity (Student's activity)

How will I proceed?

➤ Student's Activity

Students will-

1. put yellow beads in five cups and place it on their desk (desk A)
2. put green beads in five different cups and place it on the same desk.
3. take ten empty cups and place them on a separate desk.(desk B)

4. randomly pick a bead from one of the cups in desk A and transfer to one of the empty cups in desk B.
5. place a bead of same colour in the empty cup of desk A, so that it can be picked again as the activity proceeds.
6. continue till all the empty cups in desk B contain bead in it.
7. note down how many cups in desk B contain yellow beads and how many contain green beads
8. remove the beads from the ten cups in desk A.
9. randomly pick a bead from one of the cups on desk B and transfer to one of the empty cups in desk A.
10. place a bead of same colour in the empty cup of desk B, so that it can be picked again as the activity proceeds.
11. continue till all the empty cups in desk A contain bead in it.
12. note down how many cups in desk A contain yellow beads and how many contain green beads. This will be generation no.1
13. now arrange ten empty cups on desk B.
14. randomly pick a bead from one of the cups on desk A (generation no.1) and transfer to one of the empty cups in desk B.
15. place a bead of same colour in the empty cup of desk A, so that it can be picked again as the activity proceeds.
16. continue till all the empty cups in desk B contain bead in it.
17. note down how many cups in desk B contain yellow beads and how many contain green beads. This will be generation no.2
18. continue the activity till all the cups contain the same colour beads.

What have I observed?

S.No.	Generations	No. of yellow beads	No. of green beads
1.	Parental generation	5	5
2.	Generation 1		
3.	Generation 2		
4.	Generation 3		
5.	Generation 4		

(Students can continue till the number of beads of any one colour becomes zero and number of beads of the other colour becomes 10)

What have I learnt?

1. How are the beads selected by you?

2. Which bead would be found in larger number in the first generation?
3. Which bead would be dominating the population after 3 generations?
4. If bead represent alleles, what is this phenomenon called as?
5. In the above activity, shift in allele frequencies in a population over generations is due to -----
6. An evolutionary mechanism that produces ----- changes in allele frequencies in a population over time is known as -----.
7. Every population experiences genetic drift, but-----feel its effects more strongly.

What am I curious to learn?

Evolution is any shift in allele frequencies in a population over generations. Let us find out which factors lead to this shift, apart from genetic drift?

Let me evaluate myself

1. What is Genetic drift?
2. Specify the role of genetic drift in evolution.
3. If the two isolated populations separated by genetic drift become very different from each other, What is the consequence?

4. In a simple accident (stamping by an elephant foot) killed majority of the red coloured beetles from the population .With the help of this example, explain how does the population size affect evolution?

5. Imagine a bottle filled with marbles, where the marbles represent the individuals in a population. Explain how can a bottleneck event reduce genetic diversity?