

Mutations in Fruit Flies

Problem: You have a light haired female dog who just gave birth to a litter of six black puppies. You were expecting the litter to be mixed, some with light hair and some dark. How could you explain why there are no light colored puppies in the litter?

Hypothesis: It is hypothesized that the Genotype of the Mother dog is _____
It is hypothesized that the Genotype of the Father dog is _____

Experiment:

Materials: (write the materials list here)

Procedure:

1. Click on each item in the materials list
2. Observe the P1 (parent) generation
3. Click on the ether bottle to add three drops of ether to the anesthetizing bottle
4. Drag the bottle containing the tan colored male fruit fly to the anesthetizing bottle to put the flies in a twilight sleep
5. Click on the anesthetizing bottle to pout the flies onto the index card
6. Click to step 2
7. Look at the male fruit fly under the microscope
8. Click to open the lab notebook to make observations (make sure you write you observations on the data table on this lab sheet) (you must write something in each box to advance to the next step)
9. Click to step 3
10. Drag the male fly to the culture bottle
11. Click to step 4
12. Drag an Ebony bodied female to the anesthetizing bottle, put her to sleep
13. Place her on the card then observe her under the microscope. Make observations on the lab notebook. (make sure you write you observations on the data table on this lab sheet) (you must write something in each box to advance to the next step)
14. Click to step 5
15. Drop the female fly in the same culture bottle as the male
16. Wait 15 Days
17. Remove the parent flies and the click to step 6
18. Anesthetize the f1 generation of fruit flies
19. Dump the sleeping flies onto the card and select one male & one female for observation.

20. Write your observations in the lab notebook
21. Click to step 7
22. Drag the male into the container labeled males & the female to the container labeled females
23. Record the numbers of fruit flies in the lab notebook & data table
24. Click to step 8
25. Place one female and one male from the F1 generation into the second culture bottle. Wait 15 days
26. Remove the parents
27. Click to step 9
28. Anesthetize the flies and dump them on the index card
29. Examine the flies under the microscope and select one of each phenotype.
30. Place each of the four phenotypes in the appropriate containers on the left
31. Open the lab notebook and record the total number of flies in F2 generation
32. Click to step 10

Data:

Table 1.

	P1 Generation Wild Male	P1 Generation Ebony Female	F1 Generation Male	F1 Generation Female
Eye Color				
Eye Shape				
Wing Shape				
Body Color				

Observation: What body color was produced in the f1 generation? _____

Table 2: Results of F1 Cross (*Tan Male X Ebony Female*)

Phenotype	Number of flies
Tan Female	
Tan Male	
Ebony Female	
Ebony Male	

Table 3: Second Cross Prediction (*F1 Male X F1 Female*)

Males	Tan	Ebony

Females	Tan	Ebony

Table 4: Results of 2nd cross (F2 generation) (*F1 Male X F1 Female*)

Phenotype	# of Flies
Tan Female	
Tan Male	
Ebony Female	
Ebony Male	

Analysis Questions:

1. Describe the difference in body color observed in the F1 & F2 generation? _____

2. Construct a Punnett square to show the original cross between the tan fruit fly and the ebony fruit fly.

3. What is the genotypic ratio of the F1 generation? What is the phenotypic ratio of the F1 generation?

4. Construct a Punnett square to show the F2 Cross

5. What is the genotypic ratio of the F2 generation? What is the phenotypic ratio of the F2 generation?

6. Is the trait for ebony body color dominant or recessive? How can you tell?

7. Why did the Ebony body color disappear in the F1 generation but reappear in the F2 generation?

8. Why do you think the puppy litter was all dark haired even though the mom was light haired?

