**Monohybrid Cross: Identifying Inheritance Pattern**

**Background:** You will be studying two traits in a fictional mammal-like organism. The wild type phenotype is black eyes and tailless. White eyes and tails are mutant traits. All P generation organisms are assumed to be homozygous.

1. **White Eyes**

**Question:** What is the inheritance pattern of the white eye mutation?

1. Select a P generation pair to test for the inheritance pattern of white eyes. You can choose from the shaded options indicated on the grid. Since we are testing for the inheritance of white eyes, the presence or absence of a tail is not important to this cross.
2. 

P generation cross: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Record the results.

**F1 Results:**



1. Select the F1 cross

F1 generation cross: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Make a chart to record the F2 results.

**F2 Results:**



**Analysis:**

1. Is there a significant difference in expression of the white eye trait in males and females in either the F1 or F2 results?
2. Based on the previous answer, is this eye color gene located on the X chromosome or an autosome?
3. What are the genotypes of the P generation cross?

P generation cross: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Based on the F1 generation results, which allele (white or black) is dominant? Use a Punnett square to demonstrate your reasoning.
2. What is the genotype of F1 individuals?
3. Use a Punnett square to show the F1 cross and determine the expected F2 phenotype distribution.

**F2 Expected:**



1. Compare your expected % to the observed F2 data. Is the data consistent with your hypothesis of the inheritance pattern (from question 9)?
2. **Tail**

Use the same process as in Part I to determine the inheritance pattern of the tail trait.

P generation cross: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**F1 Results:**



F1 generation cross: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**F2 Results:**



**Analysis:**

**F2 Expected:**



What is the inheritance pattern for this trait? Explain the evidence for your conclusion. You may use Punnett squares as part of your explanation.