

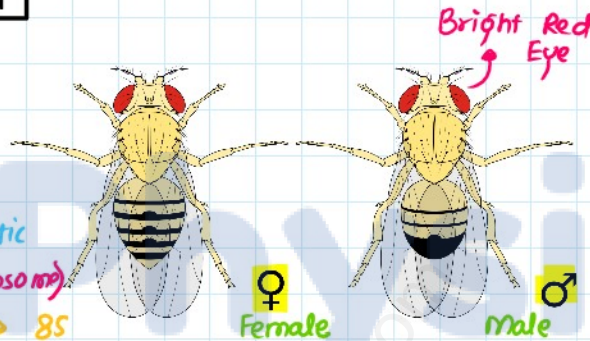
## Sex Linkage in Drosophila

T. H. Morgan → 1910

Experimental Organism → *Drosophila melanogaster*

### Advantages of Drosophila

- Easy to Capture
- Sexual Dimorphism
- Generation time (14 days / 2 weeks)
- Excellent for genetic studies (Giant chromosome)
- Contrasting traits → 85
- Human Genome Project



Eye Colour  
→ Wild Type (Bright Red Eye)  
→ White Eye (male)  
↑  
Calvin Bridges

### STEP-I Normal Cross

RED EYE (Female) × WHITE EYE (male)  $P_1$

1237 → Red Eye is dominant  
Red Eyed

### STEP-II Normal Cross

RED EYE (Female) × RED EYE (male)  $F_1$

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RED EYE (Females) : RED EYE (Male) : WHITE EYE (male)  $F_2$   
2459 : 1011 : 782

### Observations

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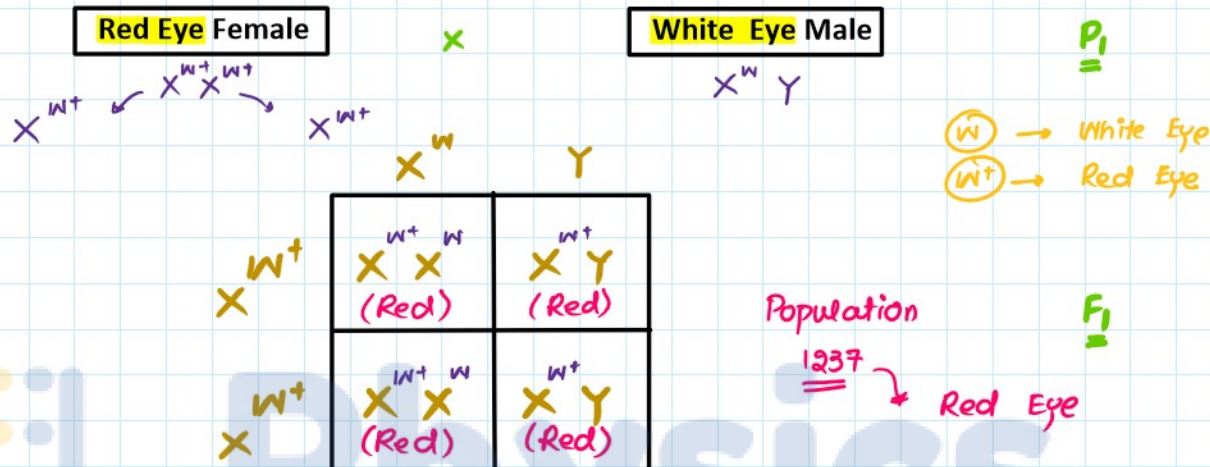
- Red Eye (3) : White Eye (1) ×
- Ratio is not fit to Mendelian Ratio (3:1)
- Recessive trait individuals were quite small.
- All white eyed were male.
- No White Eyed Female were observed.

### Conclusion

- Eye colour inheritance is associated with sex.
- Gene for eye colour is on X-chromosome.
- No allele on Y-chromosome.

# CROSSES OF DROSPHILA

## STEP-I

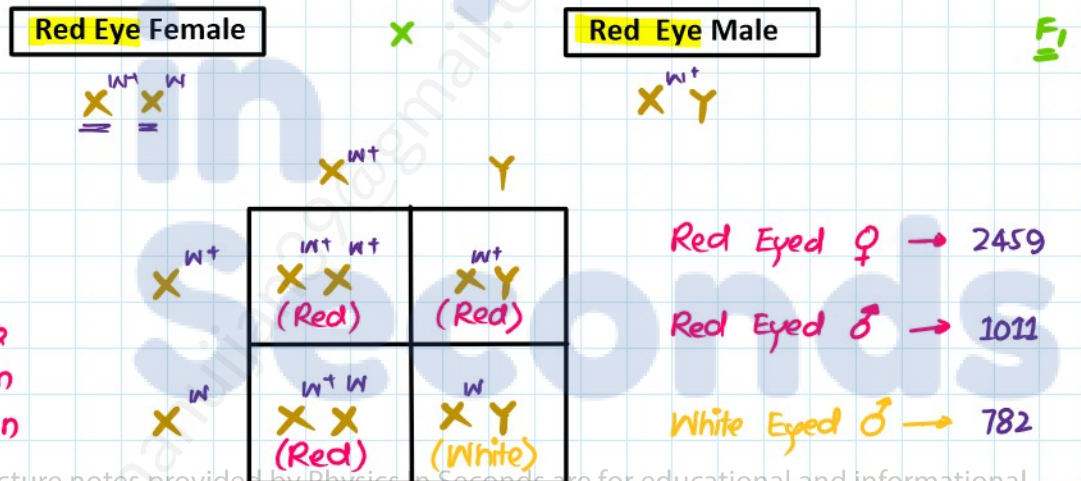


## STEP-II

$F_1 \times F_1$

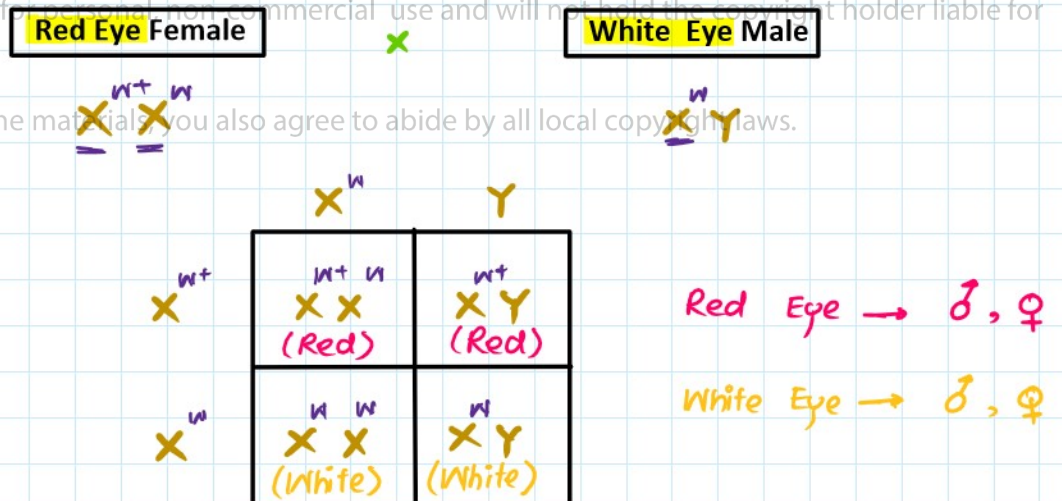
No 3:1

- Result of  $F_2$  cross is in Non-mendelian Ratio.



## STEP-III

(Test Cross)



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# STEP-IV → Reciprocal Cross

White Eye Female



Red Eye Male



	$\times^{w^+}$	$Y$
$\times^w$	$\begin{array}{c} w \quad w^+ \\ \times \times \\ \text{(Red)} \end{array}$	$\begin{array}{c} w \\ \times Y \\ \text{(White)} \end{array}$
$\times^w$	$\begin{array}{c} w \quad w^+ \\ \times \times \\ \text{(Red)} \end{array}$	$\begin{array}{c} w \\ \times Y \\ \text{(White)} \end{array}$

Red Eye → ♀

White Eye → ♂

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