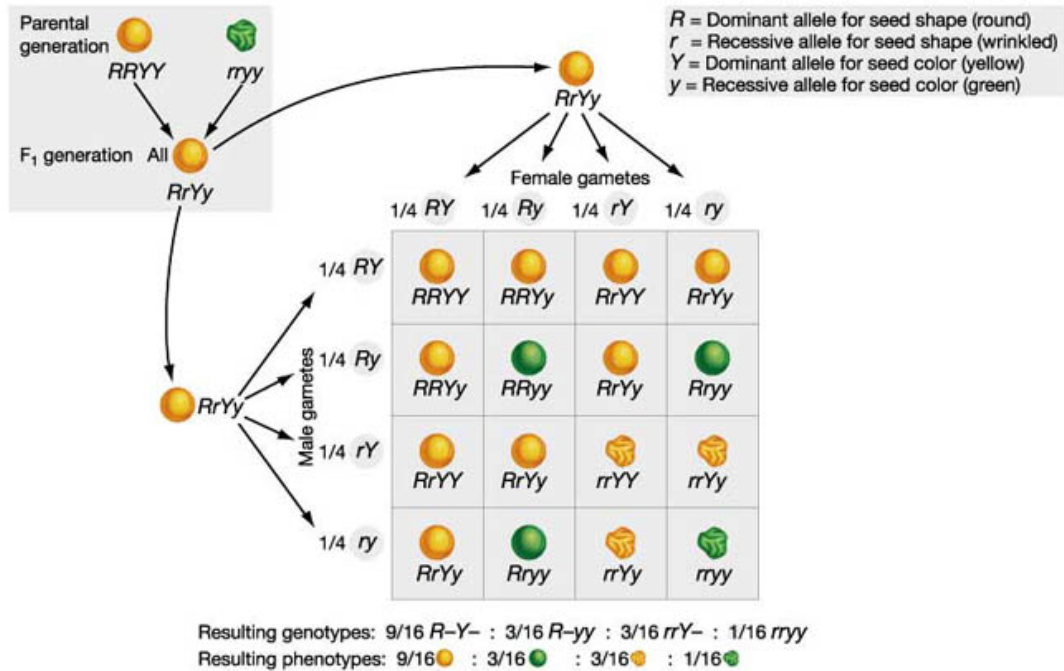


Blood Type Genetics

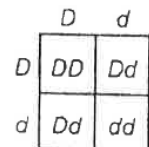
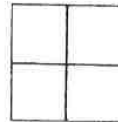
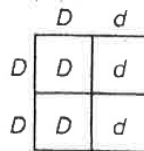
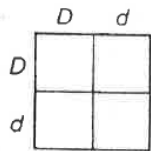
I_A , I_B , and i code for different proteins on the surface of red blood cells. The i allele is recessive. I_A and I_B are dominant to O . I_A and I_B are codominant to each other.

Fill in the table below and then answer the questions that follow

Blood Type (Phenotype)	Genotype
Homozygous for type A	$I_A I_A$
Heterozygous for type A	$I_A i$
Homozygous for type B	$I_B I_B$
Heterozygous for type B	$I_B i$
Type AB	$I_A I_B$
Type O	ii



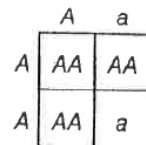
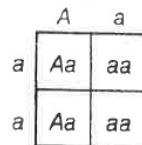
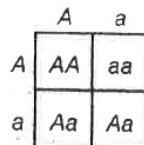
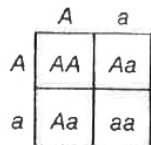
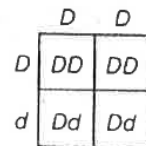
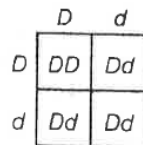
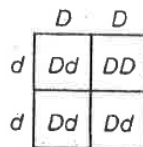
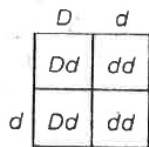
3. Examine the diagrams below. Each is a step in the Punnett square method. Put the steps in order by writing the numbers 1 to 4 below them on the correct blanks.



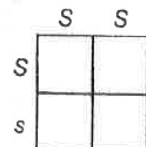
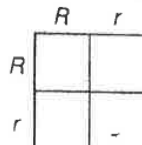
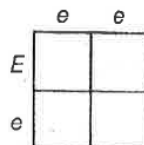
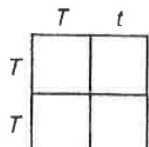
4. What do the letters outside the Punnett square stand for? _____

What do the letters inside each box stand for? _____

5. Examine the following Punnett squares and circle those that are correct.



6. Complete the following to determine the expected offspring.



1. In fruit flies, normal wings (W) is dominant over vestigial wings (w). The results of a cross of two flies gives the following offspring:

Normal Wing	793
Vestigial Wing	811

What was the genotype of the parents of these F1 offspring? Use a Punnett square to support your answer.

2. In fruit flies the eye color is controlled by genes. Red is dominant to white. Find the possible eye colors of the F1 generation for each of the following crosses. Use the five-step format given in class to solve each problem. (the first one is set up for you)

A) $Rr \times rr$

1) Symbols:

4) fill out the square:

2) genotypes of parents

3) possible gametes

5) Phenotypic and genotypic ratios:

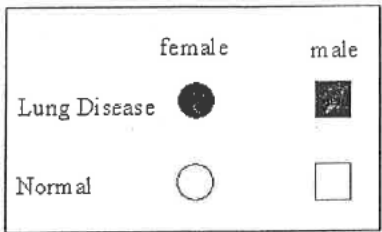
B) $rr \times RR$

C) $Rr \times Rr$

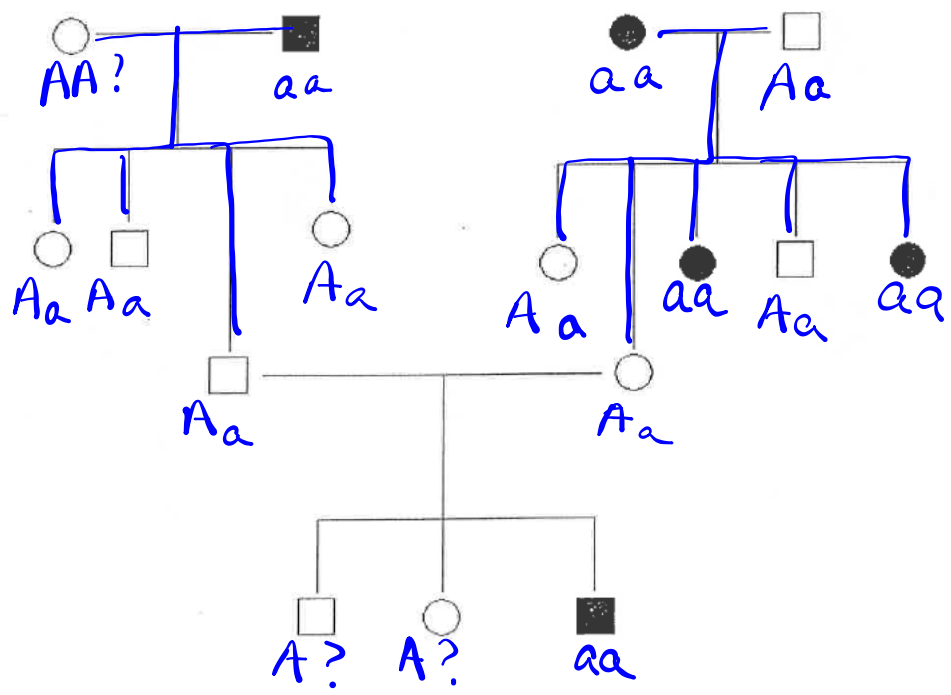
3. Circle the crosses that are possible (i.e. are written correctly) from the list below, and then complete them below using Punnett squares, solved using the five-step format given in class.

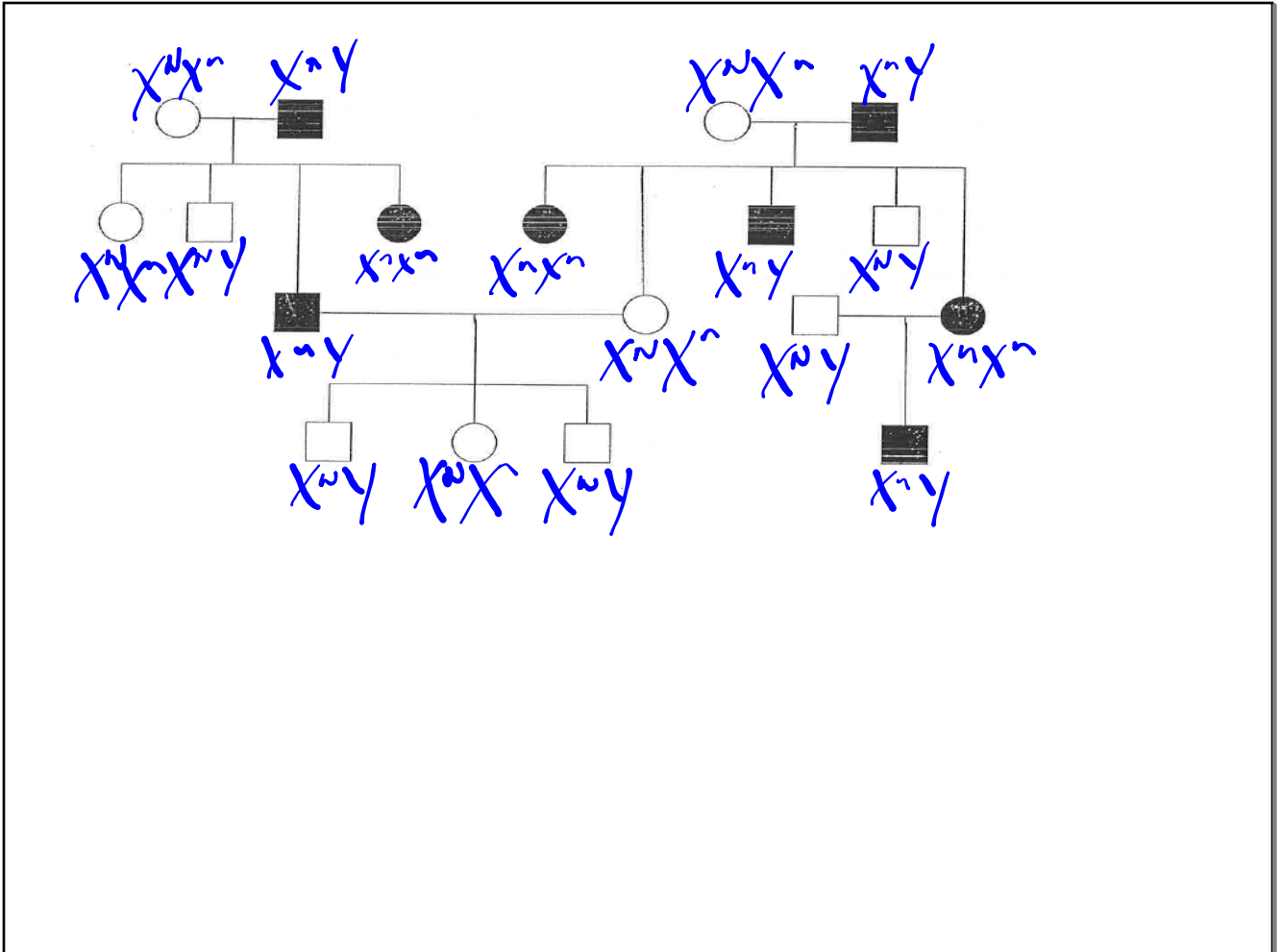
- A. $Ww \times RR$
- B. $WW \times Ww$
- C. $RW \times rw$
- D. $Rr \times RR$
- E. $Ww \times Ww$
- F. $WR \times rr$
- G. $Wwr \times Rrw$

a = disease

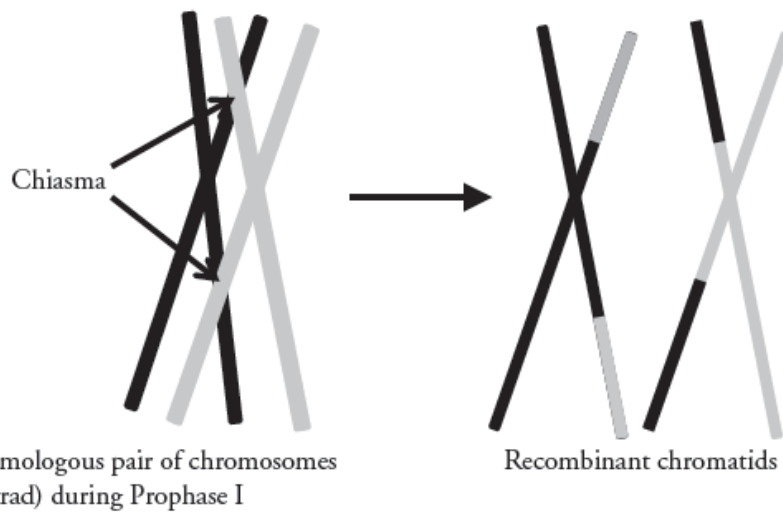


choose: $\begin{cases} AA \\ Aa \\ aa \\ A? \end{cases}$





Model 4 – Crossover of DNA in Chromosomes



Model 5 – Genetic Variation



Early Prophase I



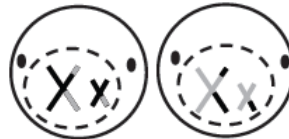
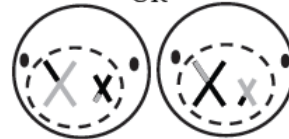
OR



Late Prophase I



OR

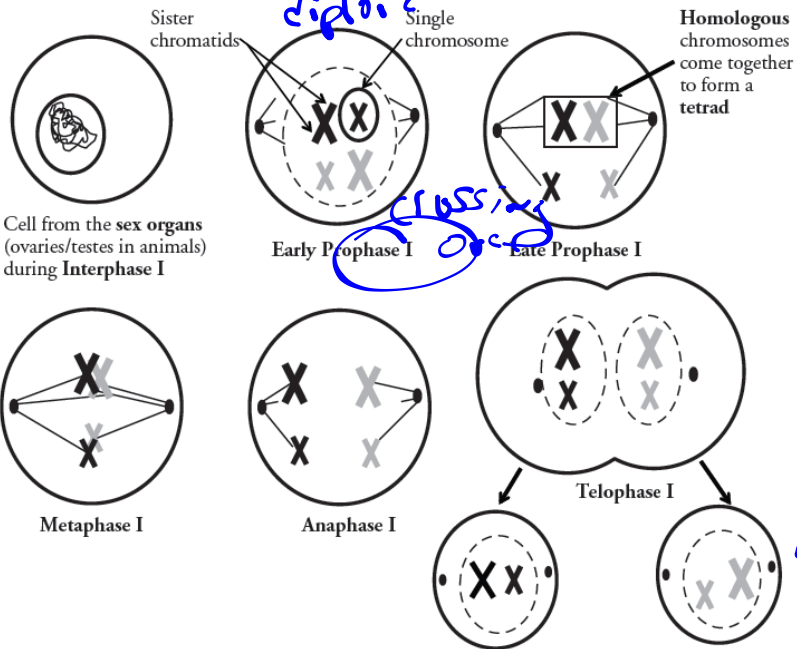


OR



Late Telophase I

Model 1 – Meiosis I



genetically different

haploid

Model 2 – Meiosis II



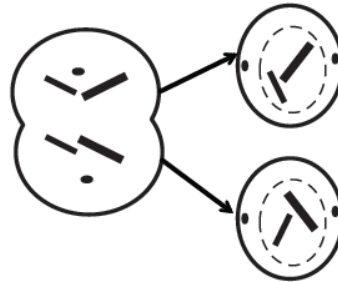
Two cells from
Meiosis I in
Prophase II



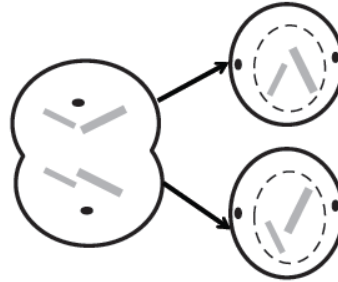
Metaphase II



Anaphase II



Telophase II



dihybrid cross:

P: $YYRR \times yyrr$

F₁: $\frac{YR}{yR}$

F₁ cross: gametes: FOIL

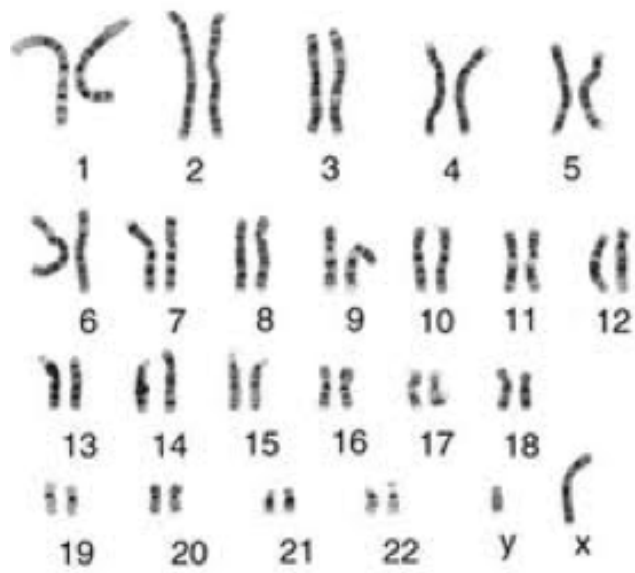
	YR	y _r	yR	y _r
YR				
y _r				
yR				
y _r				

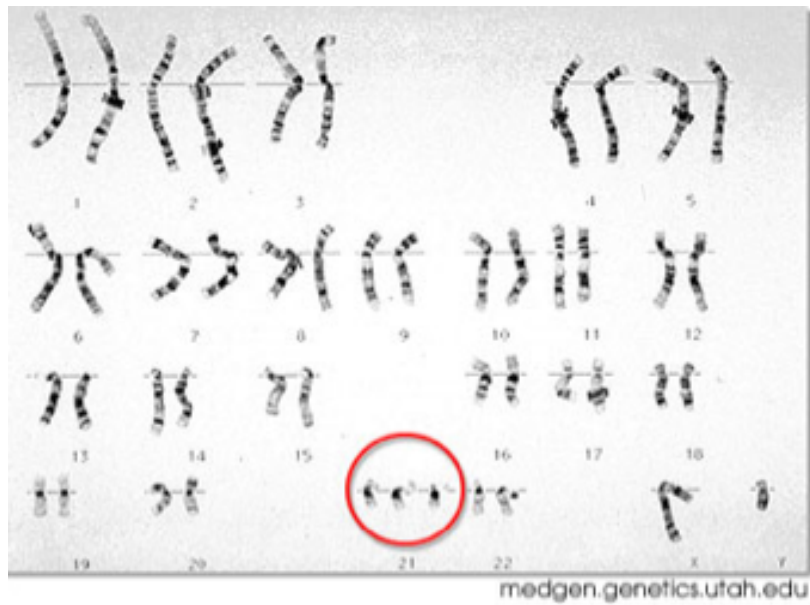
T = tongue roller

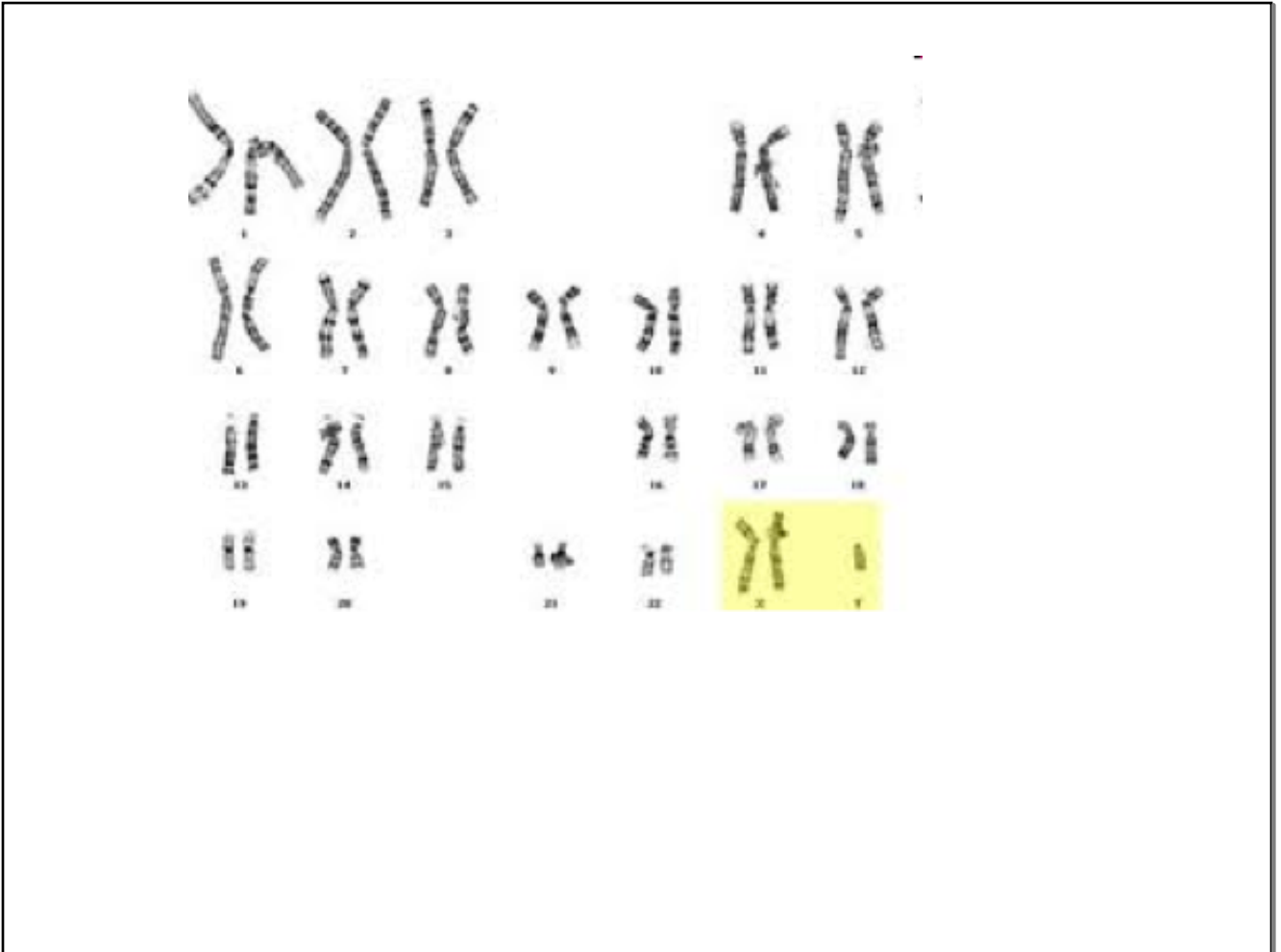
t = non-roller

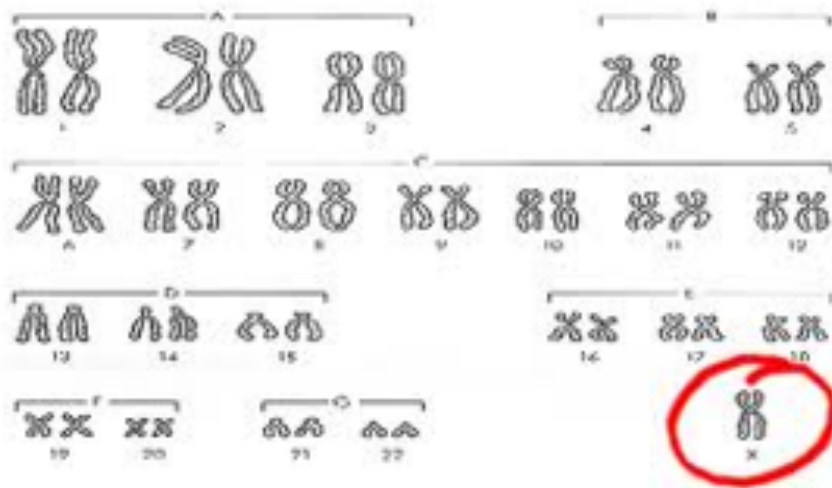
Hybrid female crossed with a non-roller

1. Write out parental genotypes and do Punnet square
2. Predict genotypic ratio of offspring
3. Predict phenotypic ratio of offspring









Yellow Autosome	P. no spots on thigh Q. green body R small comb on head [see ♀ below] S. [See ♂ below] T. [See ▶ below]	p. spots on thigh q. purple body r. large comb on head [see ♀ below]
Sex Chromosomes	U. regular thigh V. four toes W. no chest plate	u. pointed thigh v. three toes w. chest plate
X Chromosome Only	X. no. tail spike Z. long arms	x. tail spike z. short arms
Y chromosome only	+ non-fire breather Y. male sex	- fire breather

Codominant traits

* E. eye pointed at each end e. round eye Ee. eye round at front only
 ♂ S. Red spots s. yellow spots Ss. orange spots

Sex-influenced traits

+ M. wings m. no wings [dominant in presence of male hormone]
 ▶ T. no elbow spike t. elbow spike [dominant in presence of male hormone]

Sex-limited traits

♀ R or r Only males have the comb on the head.

P: TT x tt

		T	T
F ₁	t	Tt	Tt
	t	Tt	Tt

F₁ cross: Tt x Tt

phenotype:

3:1

genotype: 1:2:1

		T	t
	T	TT	Tt
	t	Tt	tt

2-factor

P: $YYRR \times yyrr$

F₁: $YyRr$ — dihybrid

F₁ cross $YyRr \times YyRr$

gametes: FOIL: $YR / Yr / yR / yr$

	YR	Yr	yR	yr	
YR	$YYRR$	$YYRr$	$YyRR$	$YyRr$	↖ 2
Yr	$YYRr$	$YYrr$	$YyRr$		
yR	$YyRR$	$YyRr$	$yyRR$	$yyRr$	
yr	$YyRr$	$Yyrr$	$yyRr$	$yyrr$	

Gene maps

