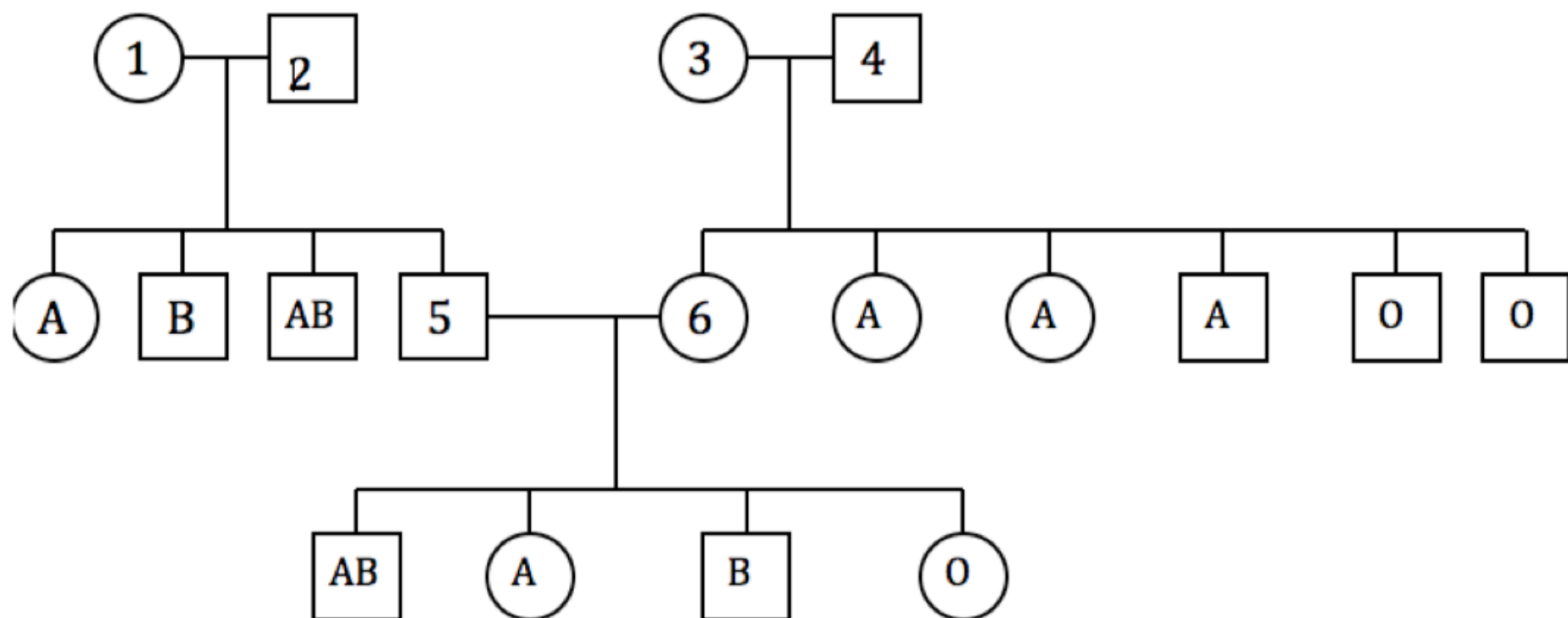
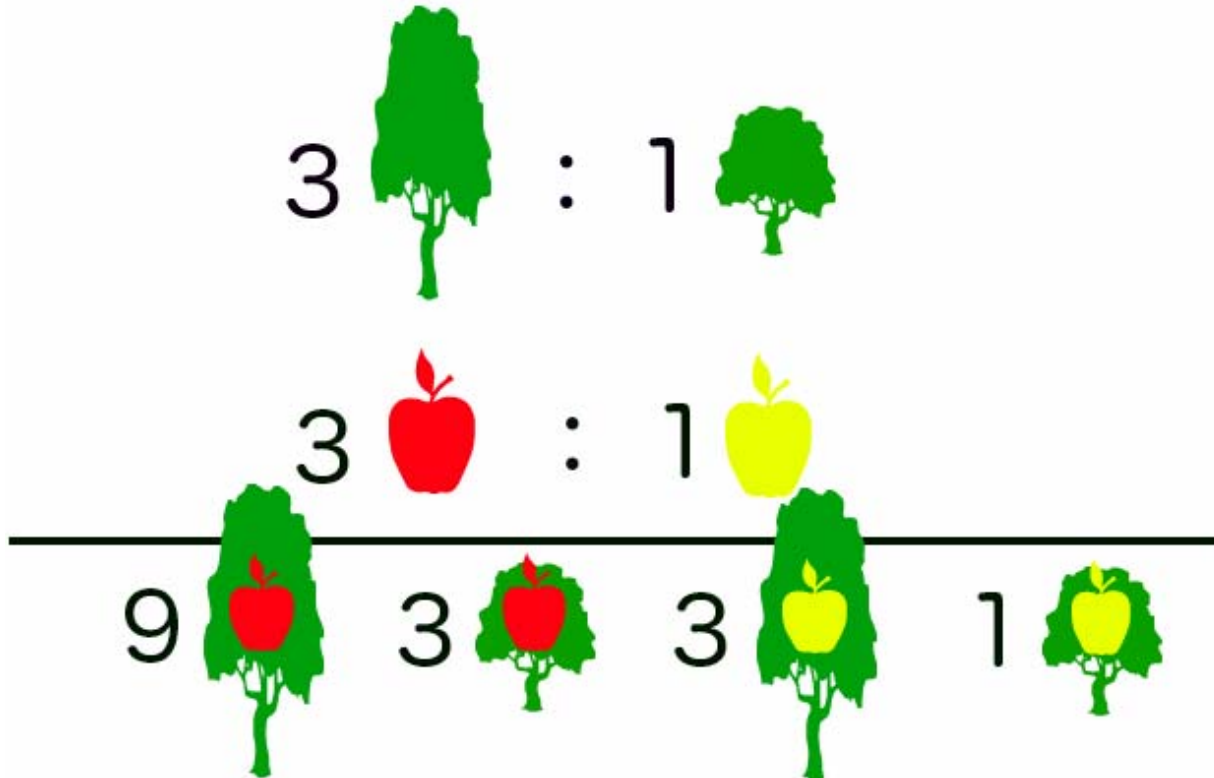


The pedigree table below shows the blood types of three generations of family members. Notice that some of the blood type phenotypes have been given to you. What is the genotype of the individuals 1 – 6? Give the probable genotype of all other family members.



Inheritance of Two Traits - Using dihybrid crosses



monohybrid crosses - investigating one trait at a time





monohybrid cross - investigating one trait at a time

diybrid cross - investigating two traits at the same
time

Mendel's Second Experiment: A Dihybrid Cross

Does the inheritance of one characteristic influence the inheritance of a second characteristic?

- crossed round, yellow seeds (dominant) with wrinkled, green seeds (recessive)



Mendel's Second Experiment: A Dihybrid Cross



x



parental
generation
(P)

F1 - What did Mendel observe???

Mendel's Second Experiment: A Dihybrid Cross





F₁ - What did Mendel observe???



YY RR



yy rr

 	YR	YR	YR	YR
yr	YyRr	YyRr	YyRr	YyRr
yr	YyRr	YyRr	YyRr	YyRr
yr	YyRr	YyRr	YyRr	YyRr
yr	YyRr	YyRr	YyRr	YyRr

All Yy Rr

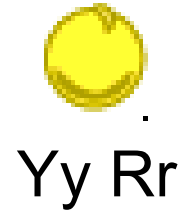


Mendel's Second Experiment: A Dihybrid Cross

F2 generation?



X

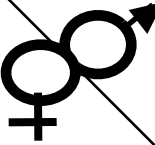


Mendel's Second Experiment: A Dihybrid Cross

F2 generation?



Yy Rr

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



Yy Rr

Mendel's Second Experiment: A Dihybrid Cross

















F2 generation?



Yy Rr



Yy Rr

♀ \ ♂	YR	Yr	yR	yr
YR	 YR	 Yr	 yR	 yr
Yr	 YR	 Yr	 yR	 yr
yR	 YR	 Yr	 yR	 yr
yr	 YR	 Yr	 yR	 yr

Yy Rr



Yy Rr

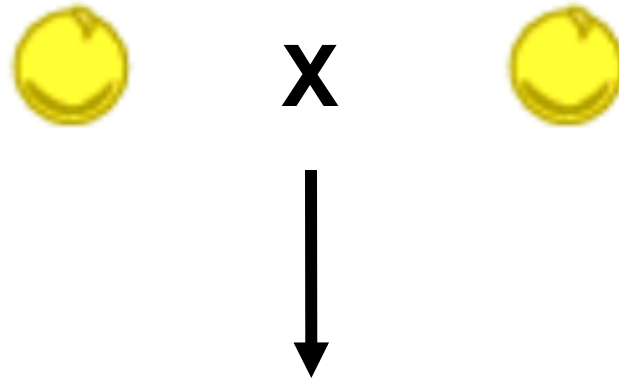


	YR	Yr	yR	yr
YR				
Yr				
yR				
yr				

Phenotype

9 : 3 : 3 : 1

F2 - What did Mendel observe?

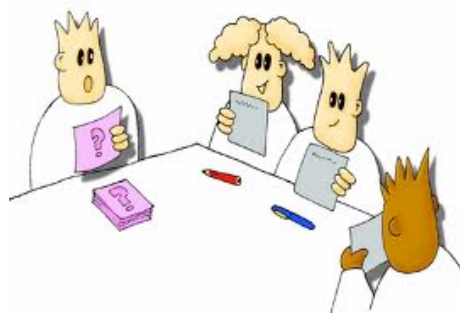


320 round, yellow		104 round, green	
101 wrinkled, yellow		36 wrinkled, green	

9:3:3:1 ratio

- this can be explained if both traits were inherited *independently* of each other

= Law of Independent Assortment (*FOR UNLINKED Genes*)



- Let's practice together....

In tomato plants, red fruit is dominant to yellow, and tall is dominant to short. True-breeding short plants that produce red fruit were crossed with true-breeding tall plants that produce yellow fruit.

Predict the genotypes & phenotypes of the F1 generation plants.

- What are the possible gametes produced by each parent?
- Complete a Punnett Square to find the F1.
- What gametes can the F1 produce?
- Complete a Punnett Square to find the F2.
- What is the phenotypic ratio of this cross.
- If 1150 plant were produced from the F1 cross,
- How many of the plants would you expect to be Yellow and Tall?



A pure line black fur, red eyed mouse is breed with a pure line white fur, grey eyed mouse. Black fur is dominant to white fur and grey eyed is dominant to red eyed.

a. *What is the genotype of this black mouse?*

b. *What gametes will it produce?*



c. *What is the genotype of this white mouse?*

d. *What gametes will it produce?*



e. *What are the F1 generation phenotypes?*

f. *What are the F1 generation genotypes?*

g. *What are the F2 generation phenotypes? Show in a Punnett square.*

A heterozygous tan, homozygous recessive curved winged fruit fly is bred with a homozygous recessive black, heterozygous straight winged fruit fly.

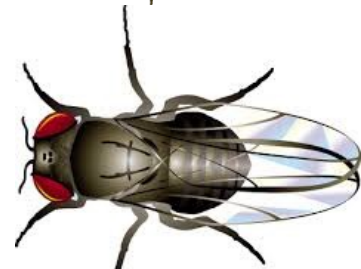
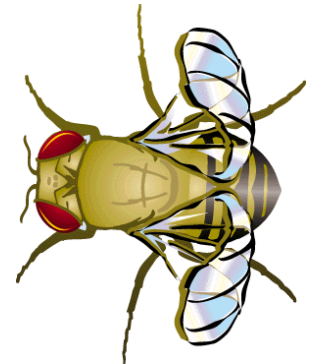
a. What is the genotype of the tan female fly?

b. *What gametes will she produce?*

c. *What is the genotype of this black male fly?*

d. *What gametes will he produce?*

e. *What are the phenotypes of the cross of these two flies?*



A blue eyed, heterozygous free-lobed man marries a heterozygous brown eyed, attached lobed woman.

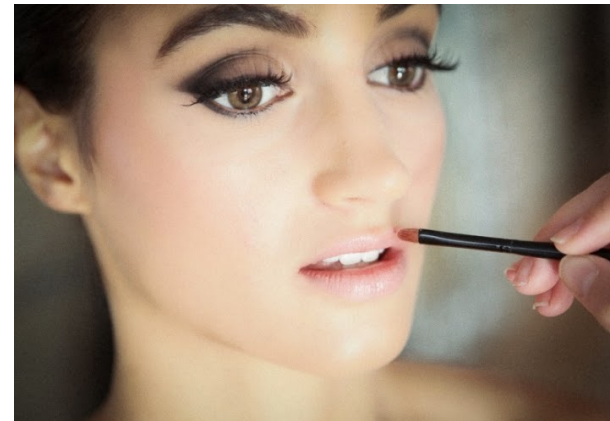
a. What is the genotype of the man?

b. What gametes will he produce?

c. What is the genotype of the woman?

d. What eggs will she produce?

e. What are the phenotypes of the cross of these two individuals?



In summer squash, white fruit colour (W) is dominant over yellow fruit colour (w) and disk-shaped fruit (D) is dominant over long-shaped fruit (d). If a squash plant heterozygous for white, heterozygous disk-shaped fruit is crossed with a yellow, heterozygous disk-shaped fruit, what will the phenotypic result of a cross



a. What is the genotype of the white disk fruit ?

b. What gametes will it produce?

c. What is the genotype of the yellow disk fruit?

d. What gametes will it produce?

e. What are the phenotypes of the cross?

Is 256 seed were produce from this cross, how many seeds would you expect to become white/disked plants at maturity?



In pigeons the checkered pattern (P) is dominant to a plain pattern (p). Red (R) colour that is dominant to brown (r). A heterozygous red, plain patterned pigeon is crossed with a brown, plain patterned pigeon

a. What is the genotype of the red/plain pigeon?

b. *What gametes will she produce?*

c. *What is the genotype to this brown/plain one?*

d. *What gametes will he produce?*

e. *What is the phenotypic ratio of the cross of these two pigeons?*

