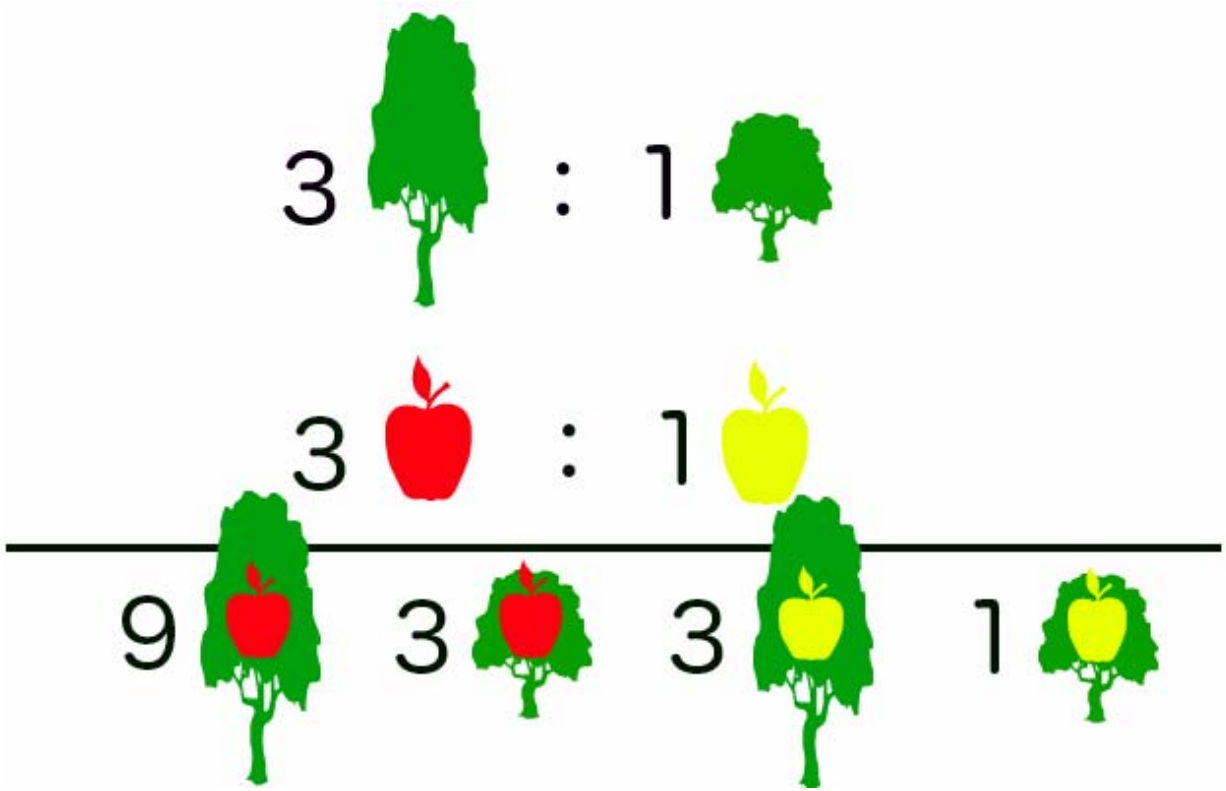
Inheritance of Two Traits



monohybrid crosses *- investigating one trait at a time*

Mendel's Second Experiment: A Dihybrid Cross

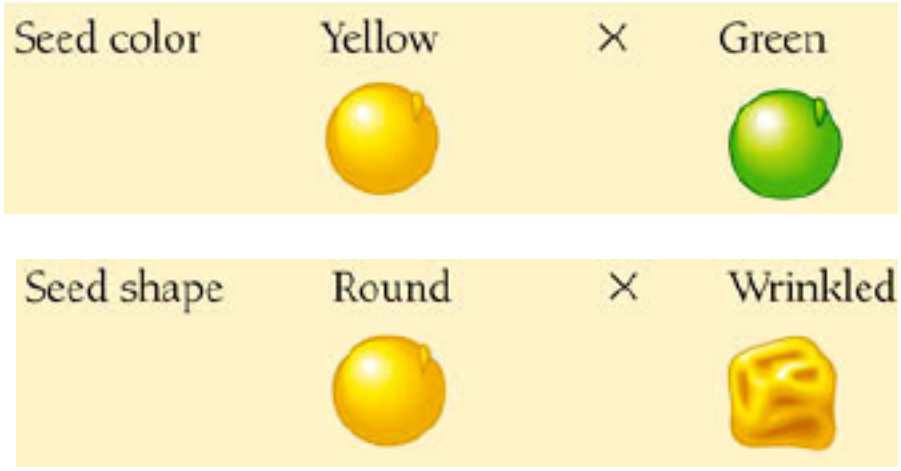
Does the inheritance of one characteristic influence the inheritance of a second characteristic?

- first examined pea shape/ colour
- looked at plants purebred for two traits

Mendel's Second Experiment: A Dihybrid Cross

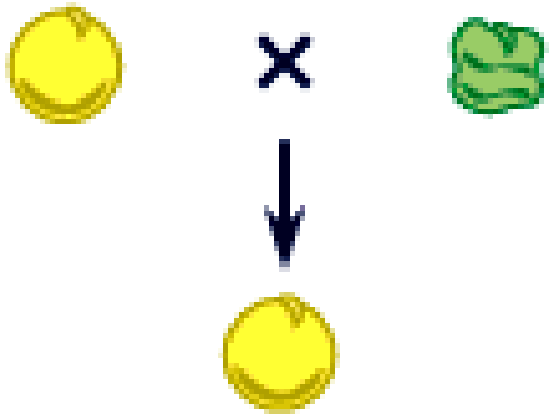
- crossed round, yellow seeds (dominant) with wrinkled, green seeds (recessive)

Dominant Recessive



Mendel's Second Experiment: A Dihybrid Cross

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



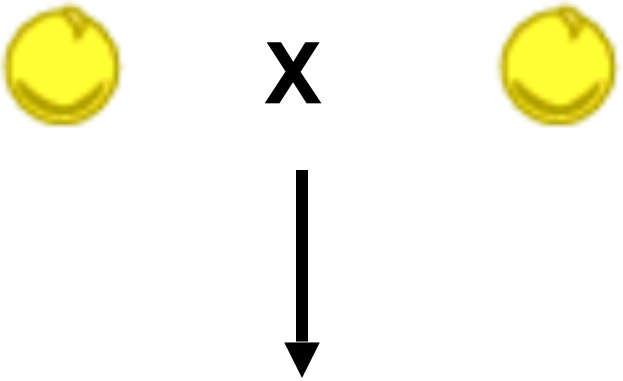
parental generation (P)

F_1 generation

F1 - What did Mendel observe???

---> all F1 were round, yellow

F2 - What did Mendel observe in the 2nd generation



320 round, yellow

101 wrinkled, yellow

104 round, green

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

Let ‘Y’ be the trait for yellow pea 

Let ‘y’ be the trait for green pea 

Let ‘R’ be the trait for round pea 

Let ‘r’ be the trait for wrinkled pea 

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

All Yy Rr

Mendel's Second Experiment: A Dihybrid Cross

F2 generation?

Yy Rr

X

Yy Rr

What will be the gametes that these F1 plants produce?

What will the punnett square look like?

Mendel's Second Experiment: A Dihybrid Cross

F2 generation?

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

Mendel's Second Experiment: A Dihybrid Cross

F2 generation?

Yy Rr

Yy Rr

♀ \ ♂	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