

(25 (3 m) 25 31025519

Pisum sativum
Garden pea not Sweet Pea

Gregor John Mendel

1822 - 1884
1856 - 1863

He
noticed
pairs of

Contrasting Characters

Austria

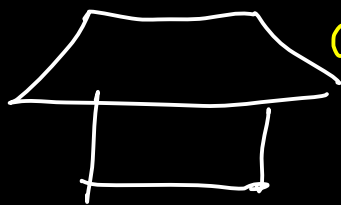
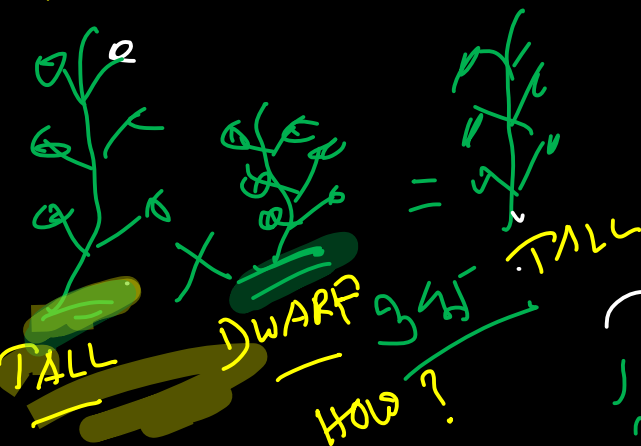
Math. - Physics

Monk

Monastery

1900

25 (3 m) 25 31025519



GARDEN

2112 2112

Garden Pea

Galileo

Newton

1212 - 355
2112 - 6012

→ 355 Pisum sativum

ଉଚ୍ଚ(ତୁଲ୍ୟ) ବାଞ୍ଛନୀୟତା

ଉଚ୍ଚ ଶରୀର - ଏକ ଗଠନ କ୍ରମ / ଦ୍ଵିଗଠନ କ୍ରମ

ଏକ ଗଠନ କ୍ରମ - ଏକ - ଚାରି / ଚାରିଗୁଣ

ଅପରାଧୀ → ଉଚ୍ଚ ଶରୀର (TALL) × ଚାରି (DWARF)

TT

(tt)

Tt

ଅଧିକ ଅଧିକ ଶରୀର → ଉଚ୍ଚ (TALL) ଚାରି ???
ଅଧିକାଂଶ

P, ଉଚ୍ଚ-ଚାରି

	T	t
T	TT	Tt
T	Tt	Tt

F, ଉଚ୍ଚ
ଅଧିକାଂଶ

ଅଧିକାଂଶ ଅ: ଶରୀର ଉଚ୍ଚ ଉଚ୍ଚ ଚାରି
ଅଧିକାଂଶ → ଉଚ୍ଚ 1. ଚାରି

Tt ×
Tt

contrasting characters of pea plant.

Exp. 1 Height - Tall / Dwarf - one character

Exp. 2 Shape - Round / Wrinkle

Exp. 3 Colour - Yellow / Green

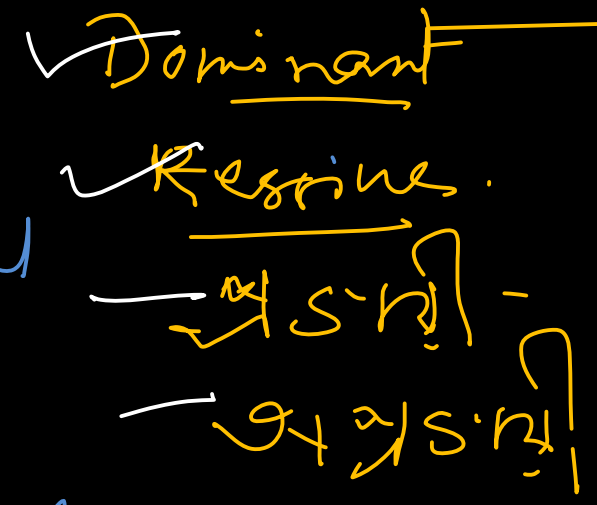
Exp. 4 Pod colour - Green / yellow

Exp. 5 Flower position - Axial / Terminal

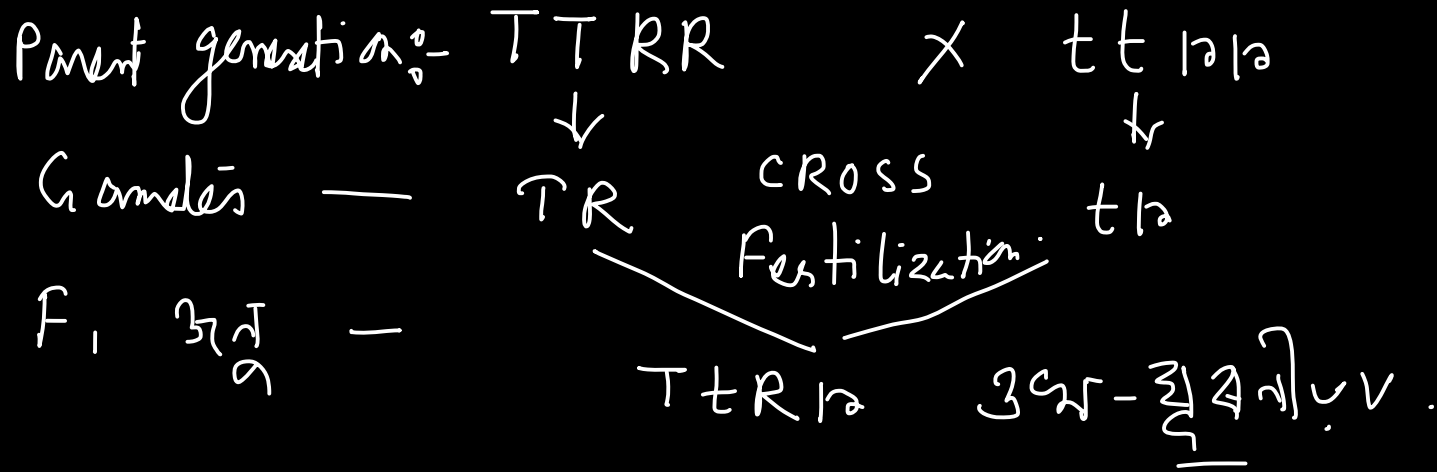
Exp. 6 ... contrasting

Exp. 7 ...

↓
Monohybrid



Dihybrid Experiment: उच्च झुआनीयता × लघुमूल (असंक्रियता)



Dihybrid cross = Inheritance of two genes.

Monohybrid cross = Inheritance of one gene.

নিচ নিচ 7 pairs character contracting

Pisum sativum

Dominant

Recessive

১) ১) ১)

২) ২) ২)



Pea pod shape - Full

constricted

1) " colour - Green

~~2) " colour - yellow~~

Seed shape - Round

Wrinkled

" colour - Yellow

Green

Flower " - Violet

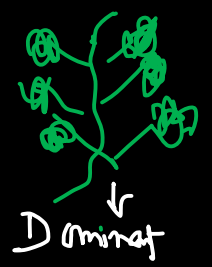
White

" position - Axial

Terminal

Plant height - Tall

6) 6) 6)



Gregor Johann Mendel

Pea plant - Pisum sativum

Homozygous

Heterozygous

Dominant

Recessive

Haploid

Diploid

LAW OF DOMINANCE

Height

TT

♀ ♀
X

tt

Diploid
Haploid

DWARF

Parental generation - TALL

2n = 14 (2n) 14
Chromosomes

T

T

t

t

F₁ generation

Tt

Tt

Tt

Tt

ratio →

GENOTYPE - Tt

ratio →

PHENOTYPE - ALL TALL

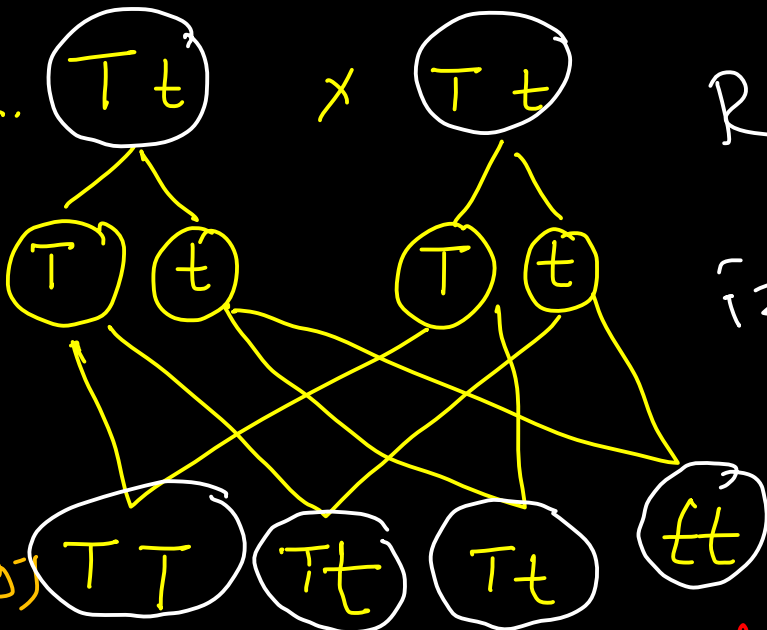
SELF FERTILIZATION OF

F_1 OFFSPRINGS / $F_1 \rightarrow Tt$

उदाहरण

F_1 self. $Tt \times Tt$

अनुपात \rightarrow



ROSE

उदाहरण

Local

$TT \rightarrow$ 100% pure

$tt \rightarrow$ 100% pure

$Tt \rightarrow$ 100% tall

उदाहरण

Phenotype

3:1

Genotype

1:2:1

उदाहरण

उदाहरण

उदाहरण

उदाहरण

F_2

1 2

1

3:1

Pure

Use of punnet square.

①. $\underline{TT} \times \underline{tt}$ (345/61014) $\frac{2021}{0141010}$ (4v1)

♂	T	Tt	Tt
♀	T	Tt	Tt

→ F₁ 321

345 \underline{Tt}

Law of Dominance

②. $\underline{Tt} \times \underline{Tt}$ (45101010)

T	TT Tall	Tt Tall
t	Tt Tall	tt Dwarf

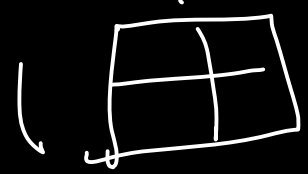
= \underline{TT} , \underline{Tt} , \underline{Tt} , \underline{tt}

F₂ 321

3 : 1

genotype.

345
61014
2021



Law of Segregation.

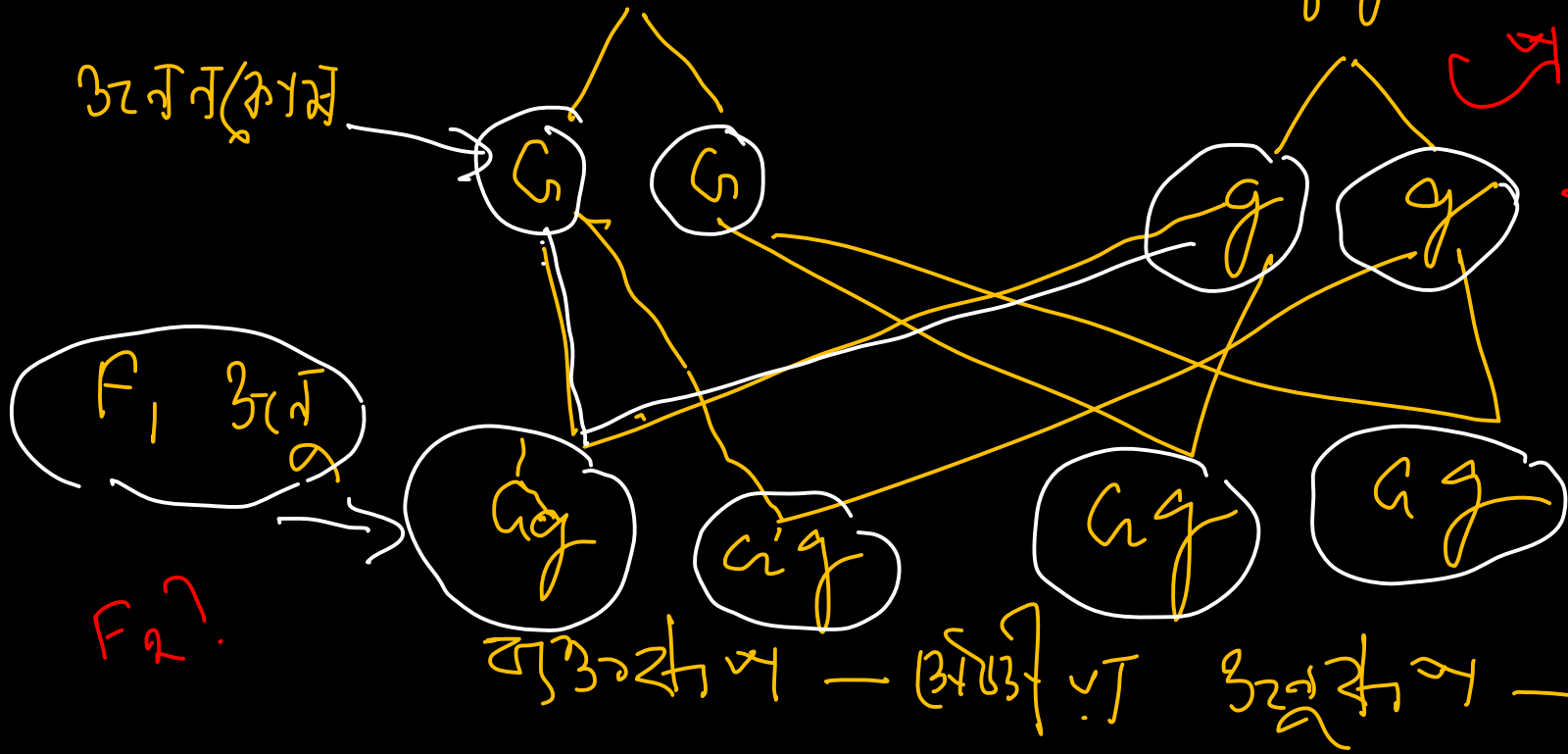
1 : 2 : 1
↓
Phenotypic.

Exp. 2. Mono hybrid exp. pea plant.
Height / shape / colour.

Parent generation \rightarrow Green \times Yellow
 GG gg

ଅନୁରାଧିତ (Recessive)

ଅଧିକତମ (Dominant)
 ଅଧିକତମ (Dominant)



F_1 ଅନୁରାଧିତ (Recessive)

F_2

ଅଧିକତମ (Dominant) — ଅଧିକତମ (Dominant) — ଅଧିକତମ (Dominant) — ଅନୁରାଧିତ (Recessive) — Gg

Back cross / Test cross

Phenotype \rightarrow TALL \times
उच्च शरीर



Dwarf
 tt



Genotype
अनुशरीर

?

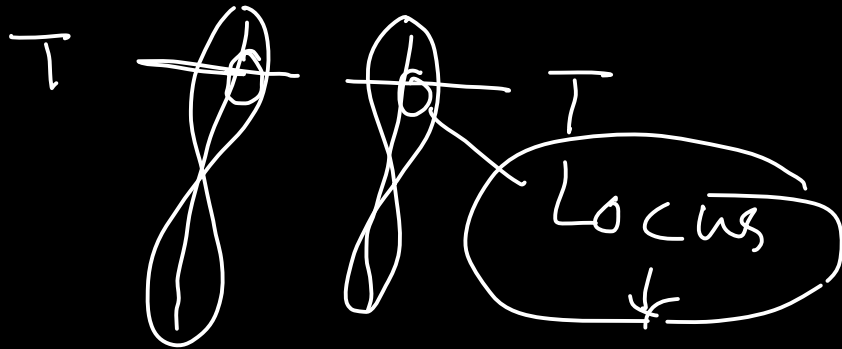
Homozygous
Recessive plant -

TT

Tt

Homozygous
Dominant

Heterozygous
Dominant



Position of

21 & 22

(A+H3)

23 p.

gene

22 - Autosomes 6 | 4 | 2

X | Y

X | Y - Sex chromosome

X | X

X | X

210 21 51 3-

F₁, F₂, F₃

↓
6 1 2 2

Ratio

Other generation.

18 2 1

↓
13 2 1

↑

→ One generation

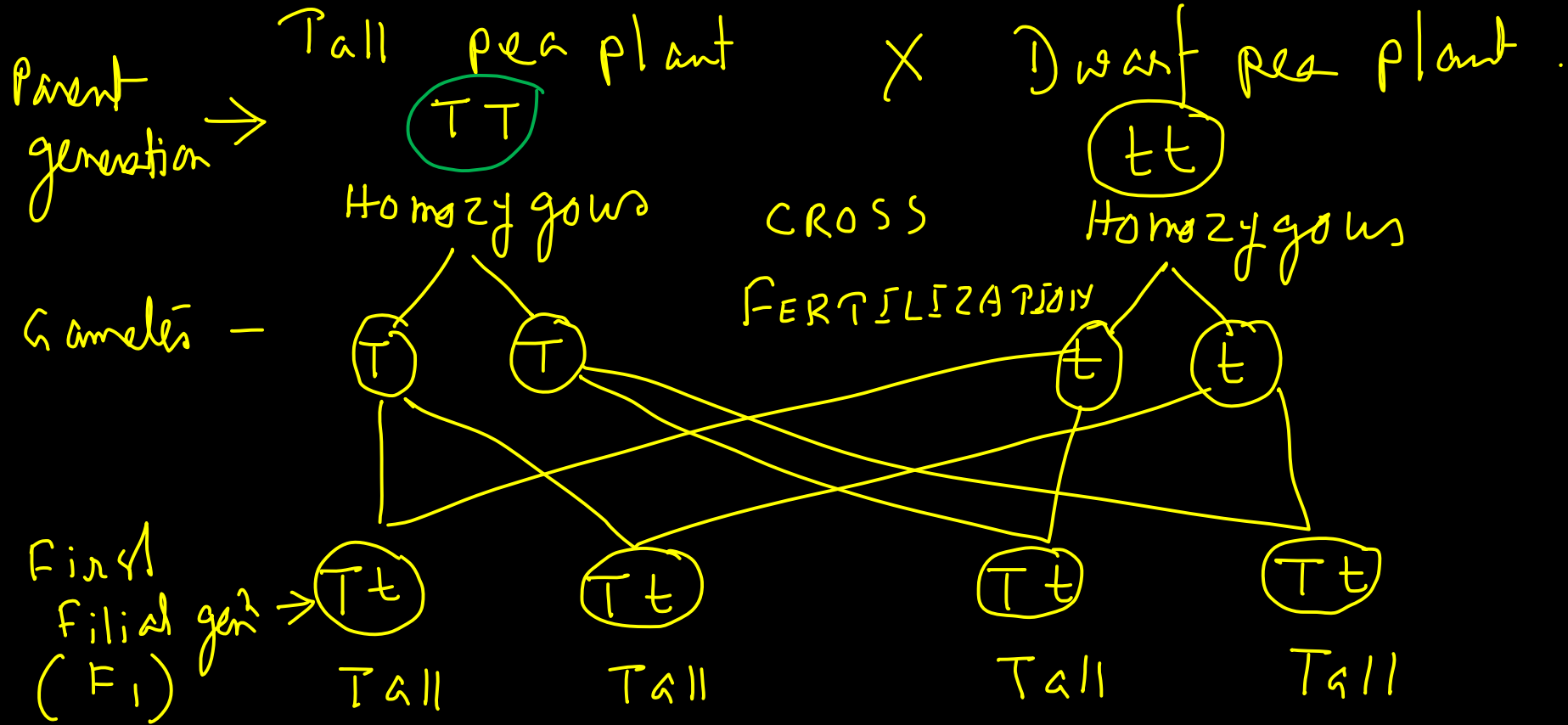
2 ନିମ୍ନ 2 ଡ଼ର ଯୁଗ୍ମରୁ F_1, F_2 .

F_2 . ଡ଼ରୁ କରାଯାଏ ଏକ ଯୁଗ୍ମ = 3 : 1

~~2 ଯୁଗ୍ମ~~ = ~~2~~ = ~~2~~
 = 1 : 2 : 1

F_3 .

Monohybrid Exp. 1.



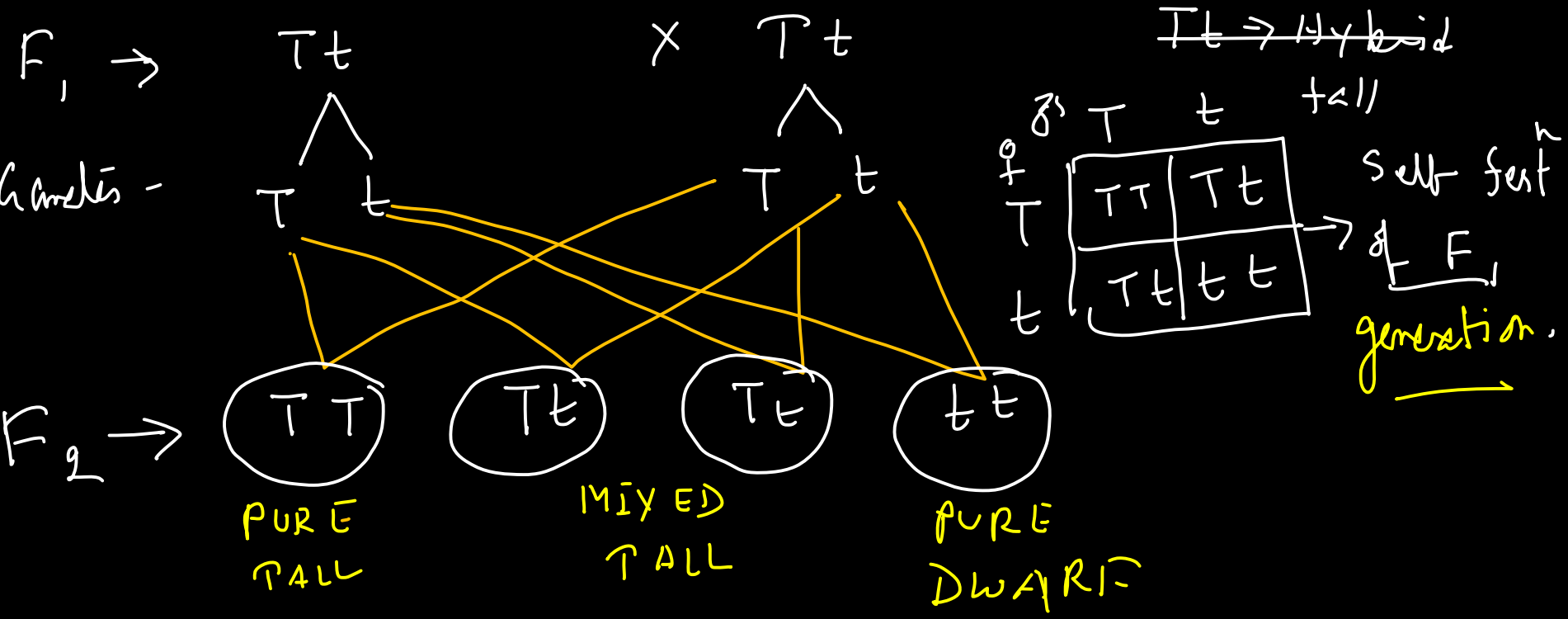
In F_1 generation all plants are tall but heterozygous tall (Tt)

TT = Homozygous tall as both the factors are same.

Tt = Heterozygous tall as " " " " are different / but as Factor 'T' is dominant phenotypically the plant is tall in nature.

(ଅଣୁଜାତ) ଅଣୁଜାତ ବିଶାଳାକାର ଯେ ଚାନ୍ଦୁ -
 ଯେ ଅଣୁଜାତ ଅଣୁଜାତ ଚାନ୍ଦୁ ନିର୍ଦଳନ (୧)
 F₁ ଅଣୁଜାତ ବିଶାଳ (ହାଣ୍ଡ ନିର୍ଦଳନ ?)
 (ଅଣୁଜାତ) (ଅଣୁଜାତ) F₁ offspring 2) ଅଣୁଜାତ
 } self fertilization
 } ଅଣୁଜାତ
 }

SELF FERTILIZATION OF F₁ generation.



Phenotypic ratio — 3:1

Genotypic ratio — 1:2:1

~ x ~

Questions:-

① Law of Dominance?

② " " Segregation?

③ " " Independent Assortment?

NEXT → DIHYBRID CROSS.

