Genetics + Heredity

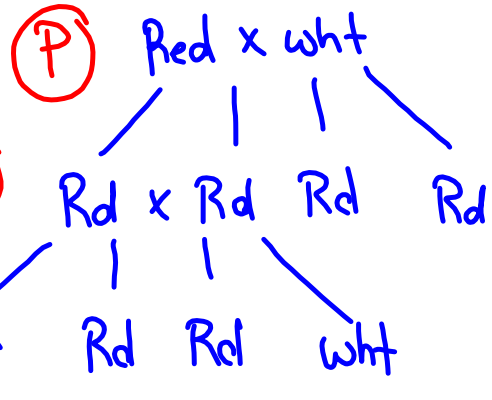
Who: Mendel

- Monk
- Studied MANY traits in pea plants
  - Ex) Flower color, heights, Pod color, Pod shape
- Used Cross-Pollination w/ a paint brush
  - ↳ transferred Pollen (mated) plants instead of letting it happen naturally

What: Experiments

(A) Made Purebreds
- Ex) Tall x Tall = Tall
  White x White = White

(B) Cross breeding:



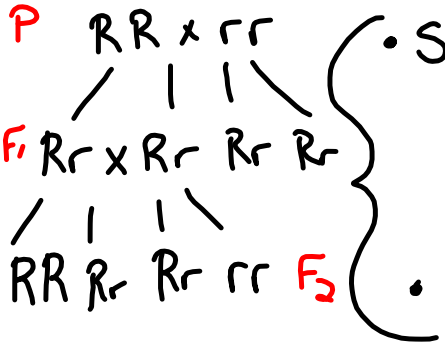
- White "factor" disappeared + then reappeared!
  - ↳ Now called "alleles"

F_1 = 100% Red
F_2 = 75% Rd 25% White

(trait = Color; alleles = Red/White)

Different options for a trait.

Conclusions: Principle of Dominance

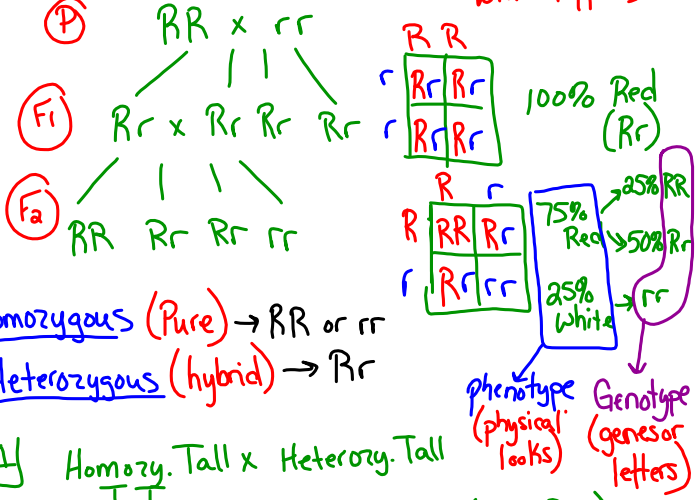


- Some alleles are Dominant
  - ↳ hide other alleles if they are there
  - Capital Letters (R) = RR or Rr = red
- Some alleles are Recessive
  - ↳ hidden unless pure
  - Lower Case letters (r) = rr only = white

Predicting Crosses

Punnett Squares → shows ALL possible kids

↳ Based on Probability (likelihood something will happen)



- Homozygous (Pure) → RR or rr
- Heterozygous (hybrid) → Rr

Ex 1) Homozy. Tall x Heterozy. Tall

T T
T TT TT
t Tt Tt

100% Tall → 50% TT (Homo. Dom.)
→ 50% Tt (Hetero)

Ex 2) Hetero. Brwn x white

B b
b Bb bb
b Bb bb

50% brwn → Bb (Hetero)
50% white → bb (Homo. Rec.)

Non-Mendelian Inheritance

① Incomplete Dom. = MIX or Blend
- one trait is Partially hiding the other

Ex) Brown x white

B B
W BW BW
W BW BW

100% TAN = BW

② Codominance = BOTH traits are dominant (Spots)

Ex) Blood Type: AA x BB = AB

Color: Brwn x White = Brown & white spots speckles

Inherited traits

- Some traits are learned = Acquired
  ↳ hair style, music ability, attitude, etc...

Chromosomes + Inheritance

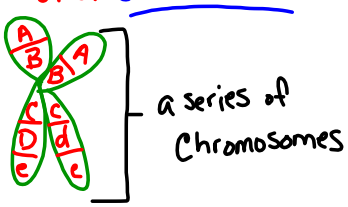
- Mendel thought TRAITS were passed on

WRONG

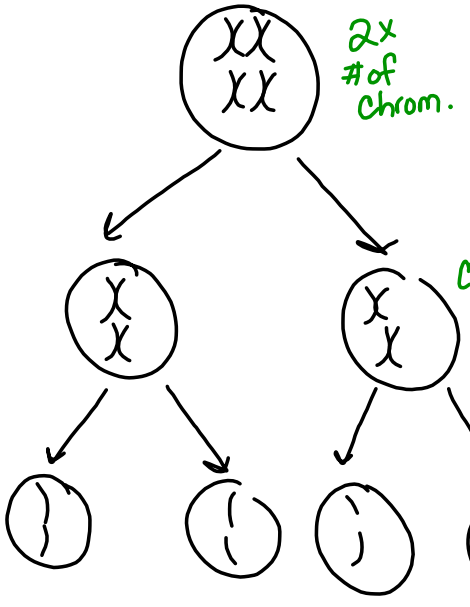
Traits are controlled by Genes

↳ Genes are sections of a Chromosome

- Chromosomes are passed on NOT traits.



Meiosis



- Chromo. are divided into FOUR Cells
- Genes shuffled = Diff. cells
- Cells divide 2x
- Cells have 1/2 # of chromosomes
- Makes 4 Sex Cells

Asexual Repro. vs. Sexual Repro.

1. 1 parent
2. Children are Clones
3. Fast

Ex) Bacteria

1. 2 parents
2. Children are Diff.
3. Slow

Ex) humans/mammals