



NON-MENDELIAN GENETICS

GRADE 10



A stylized DNA double helix with yellow ribbons and purple and blue base pairs, located in the top-left corner of the slide.

INCOMPLETE DOMINANCE

CO-DOMINANCE

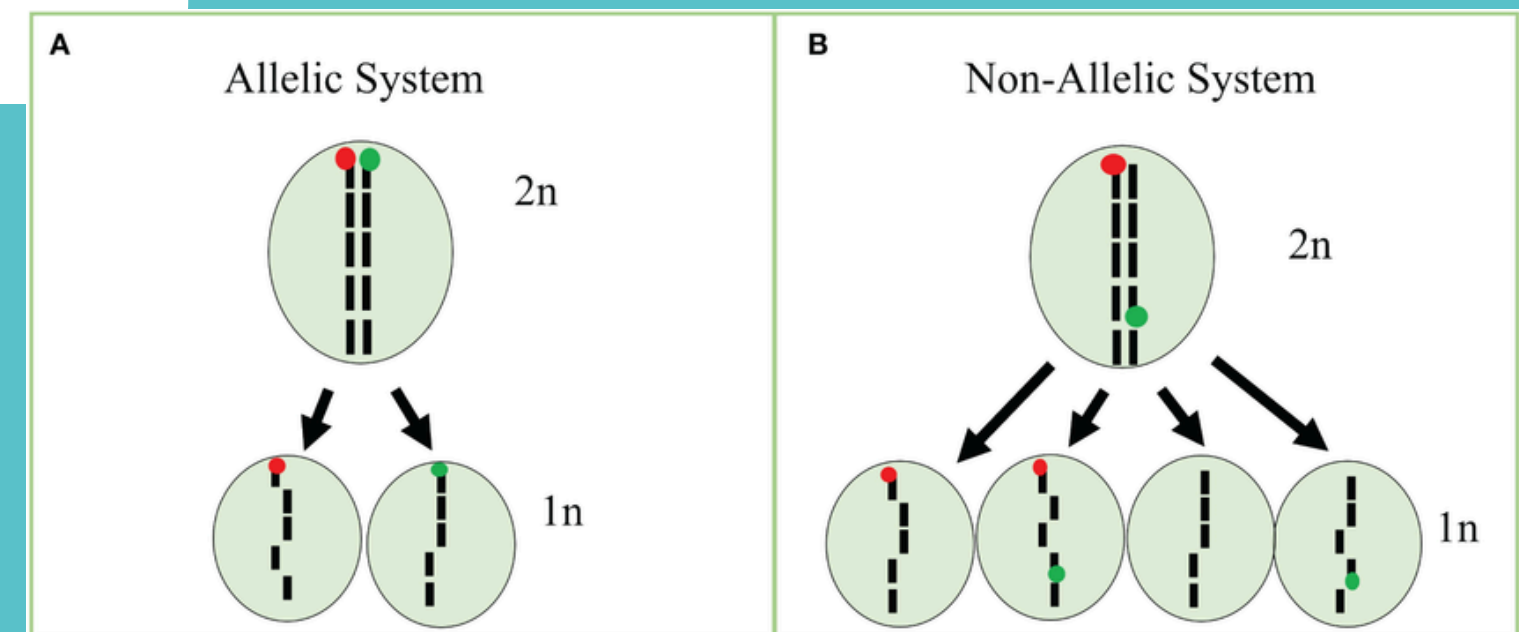
EPISTASIS

POLYGENIC TRAITS

A stylized DNA double helix with yellow ribbons and purple and blue base pairs, located in the bottom-right corner of the slide.

Learning goal

Compare the interaction of allelic and non-allelic genes.



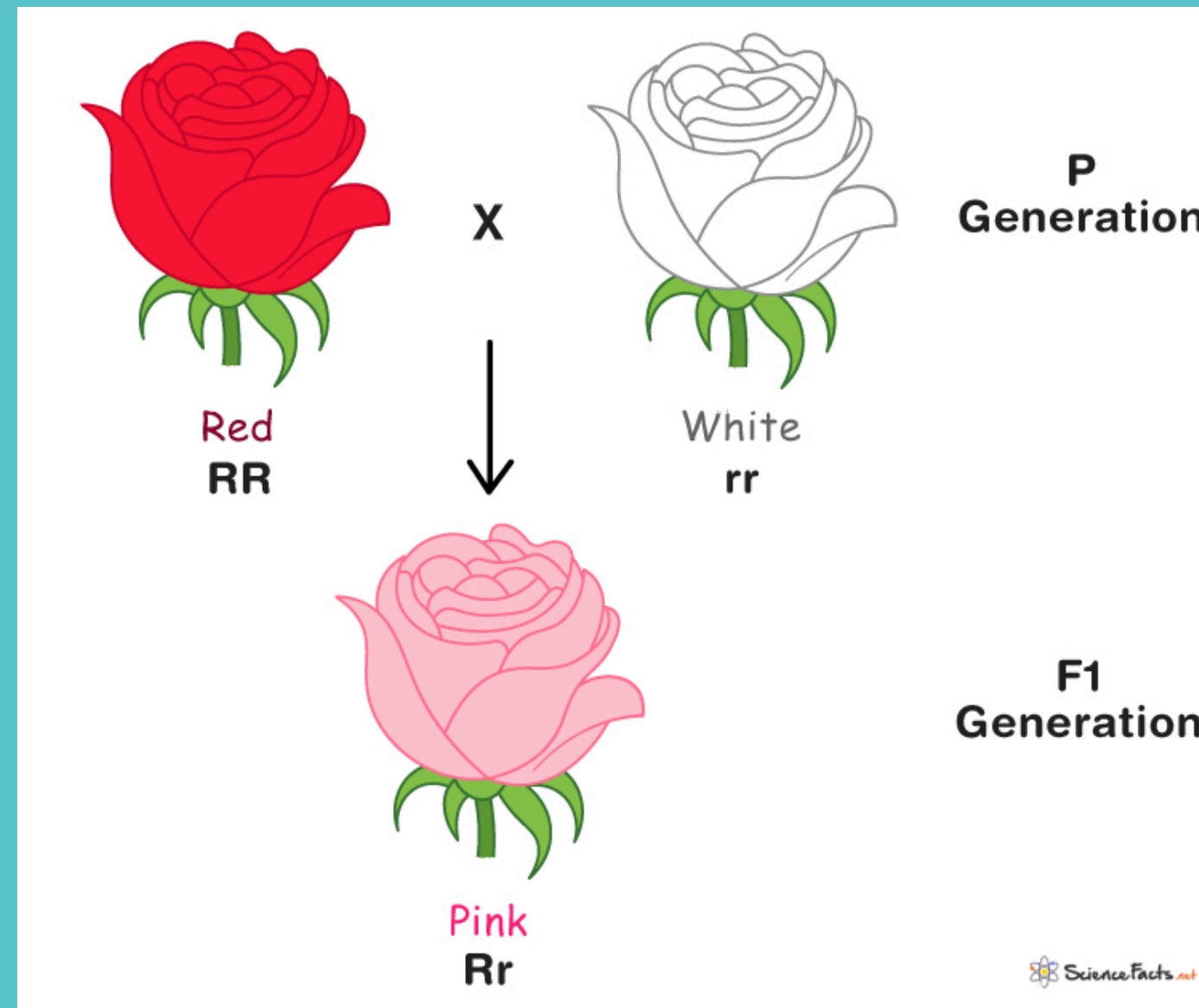
Engage

What would happen if traits didn't follow simple dominant-recessive rules? What might the offspring look like if both parent traits were equally visible or if a trait was a blend?

A stylized, colorful illustration of a DNA double helix. The sugar-phosphate backbones are represented by thick yellow ribbons that spiral around each other. The nitrogenous base pairs are shown as horizontal bars connecting the ribbons, with colors including purple, blue, and yellow. The entire graphic is set against a solid teal background.

Explore Group work

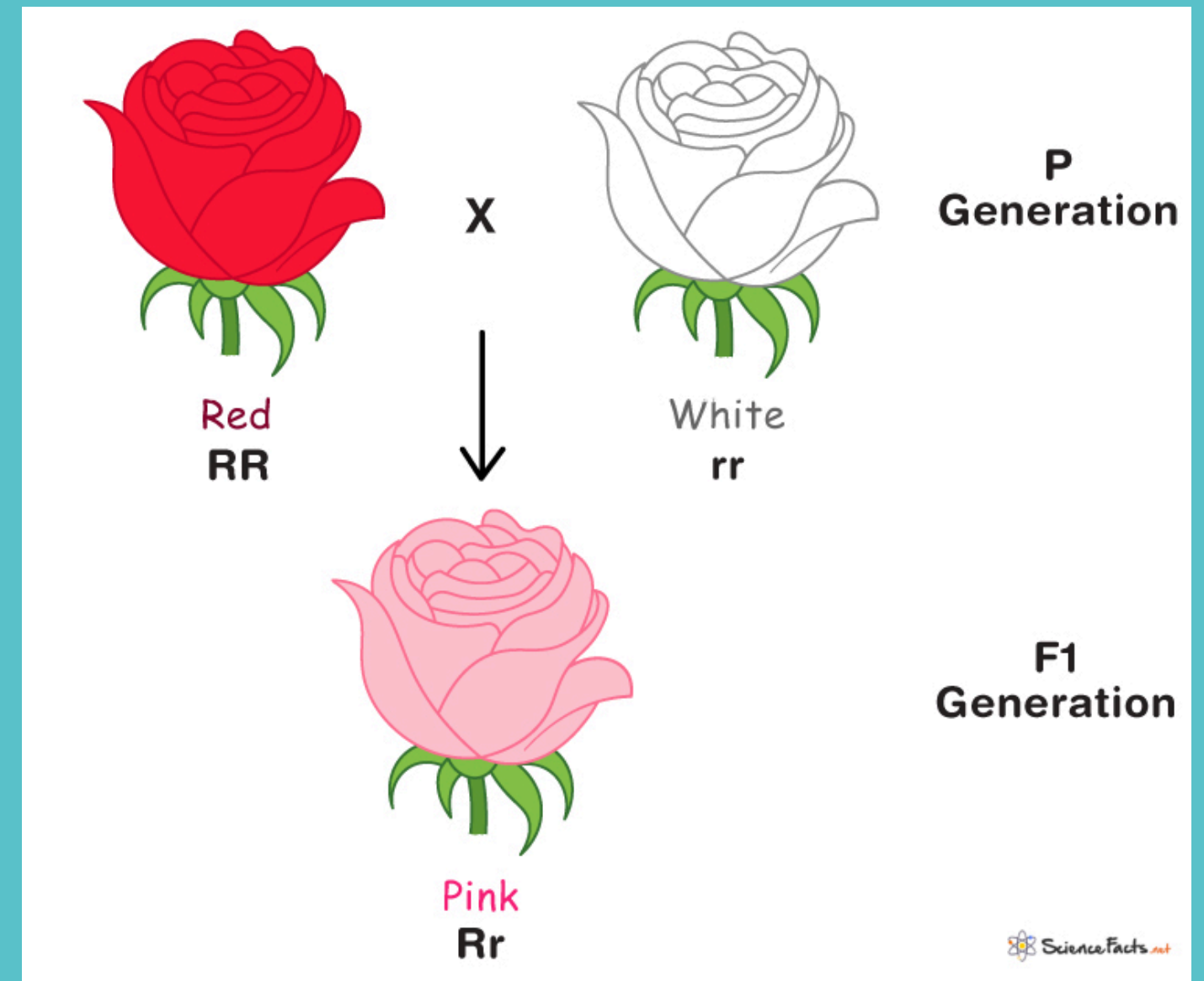
INCOMPLETE DOMINANCE



Give definition.....

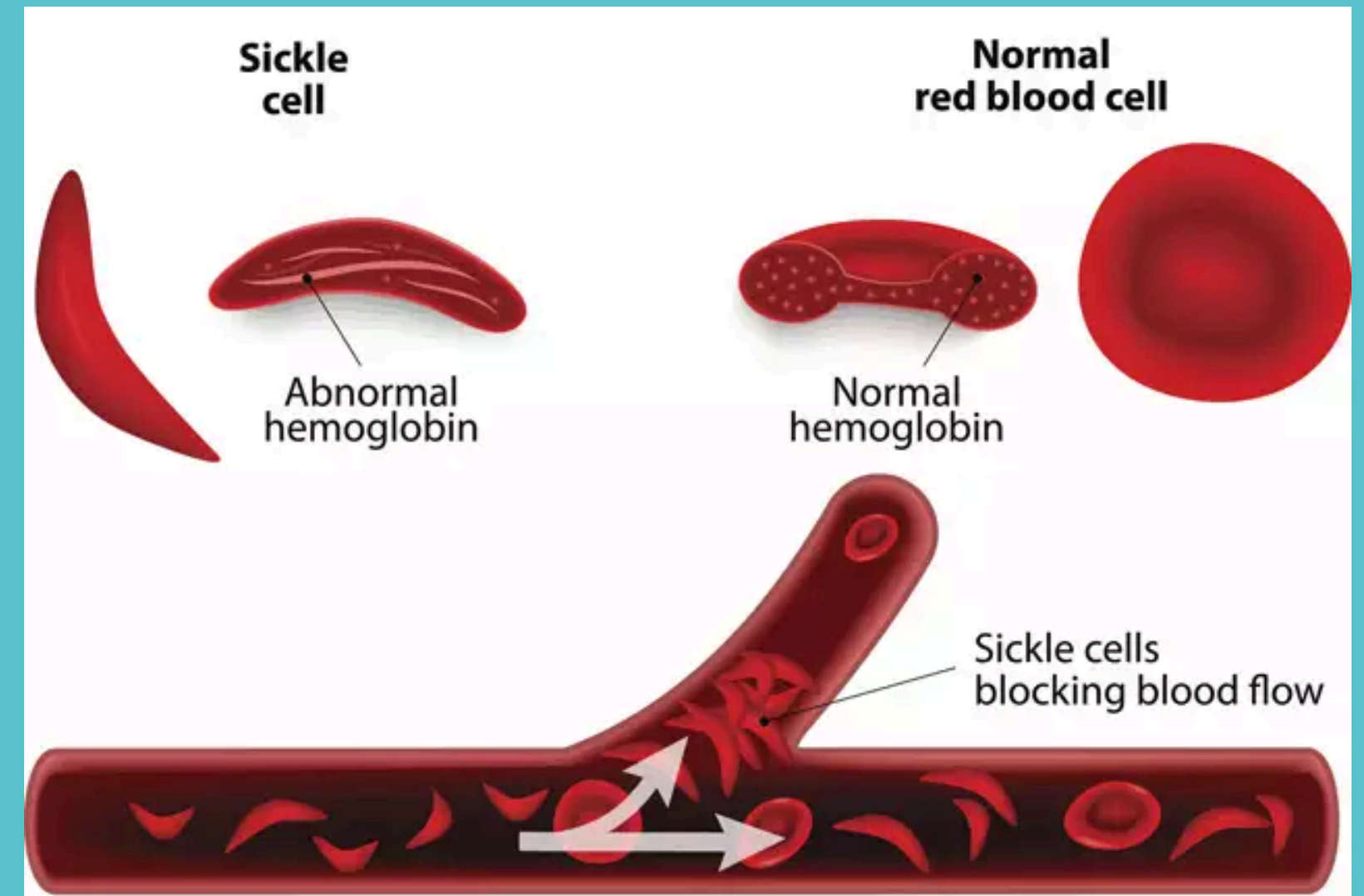
INCOMPLETE DOMINANCE

- In heterozygous organisms, the phenotype is intermediate between homozygous dominant and recessive.



INCOMPLETE DOMINANCE

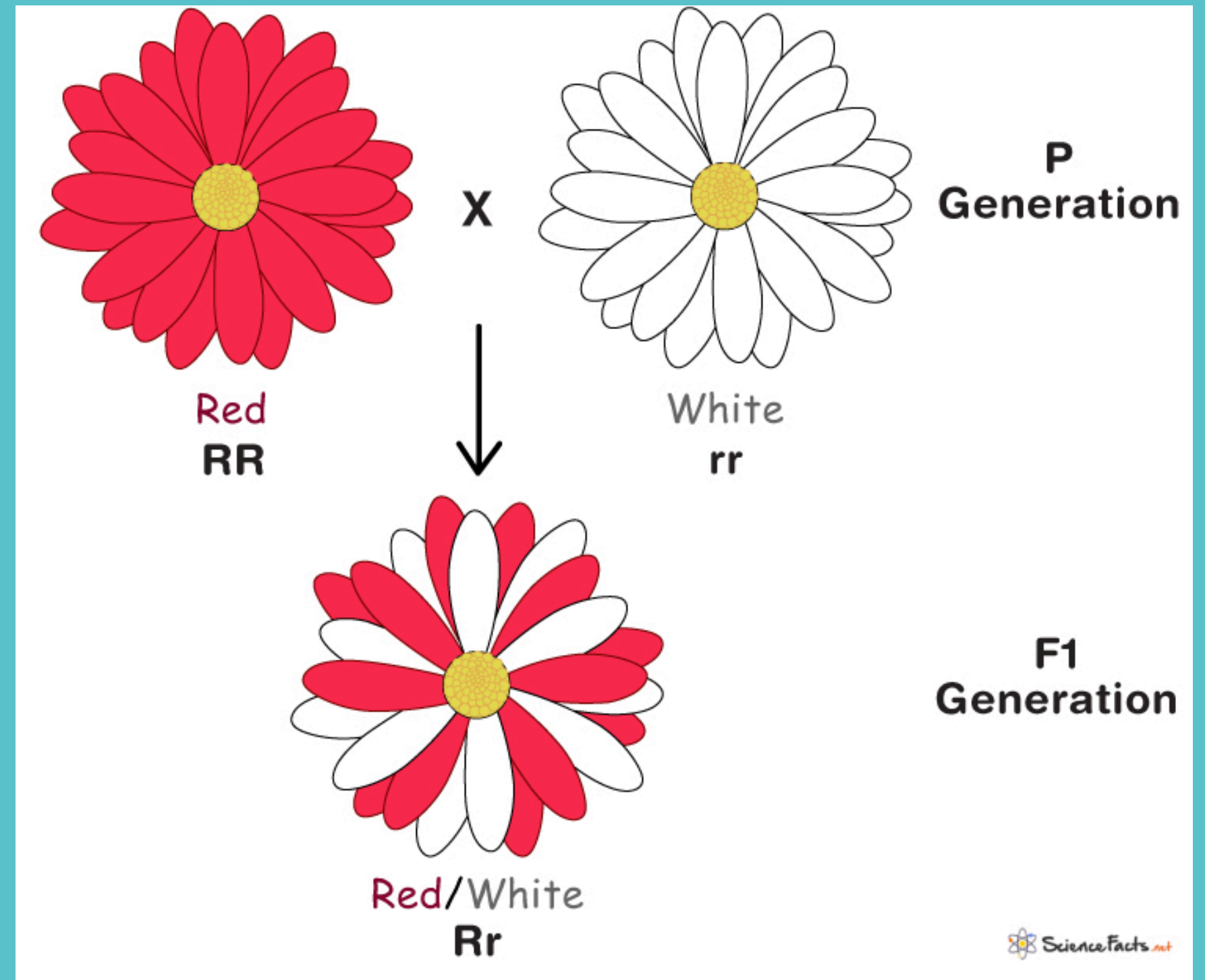
S-hemoglobins cause RBC to have a sickle shape in the deficiency of oxygen. Individuals with two mutated alleles (homozygous) die in early childhood. Heterozygous can live, with mild symptoms



Sickle cell anemia

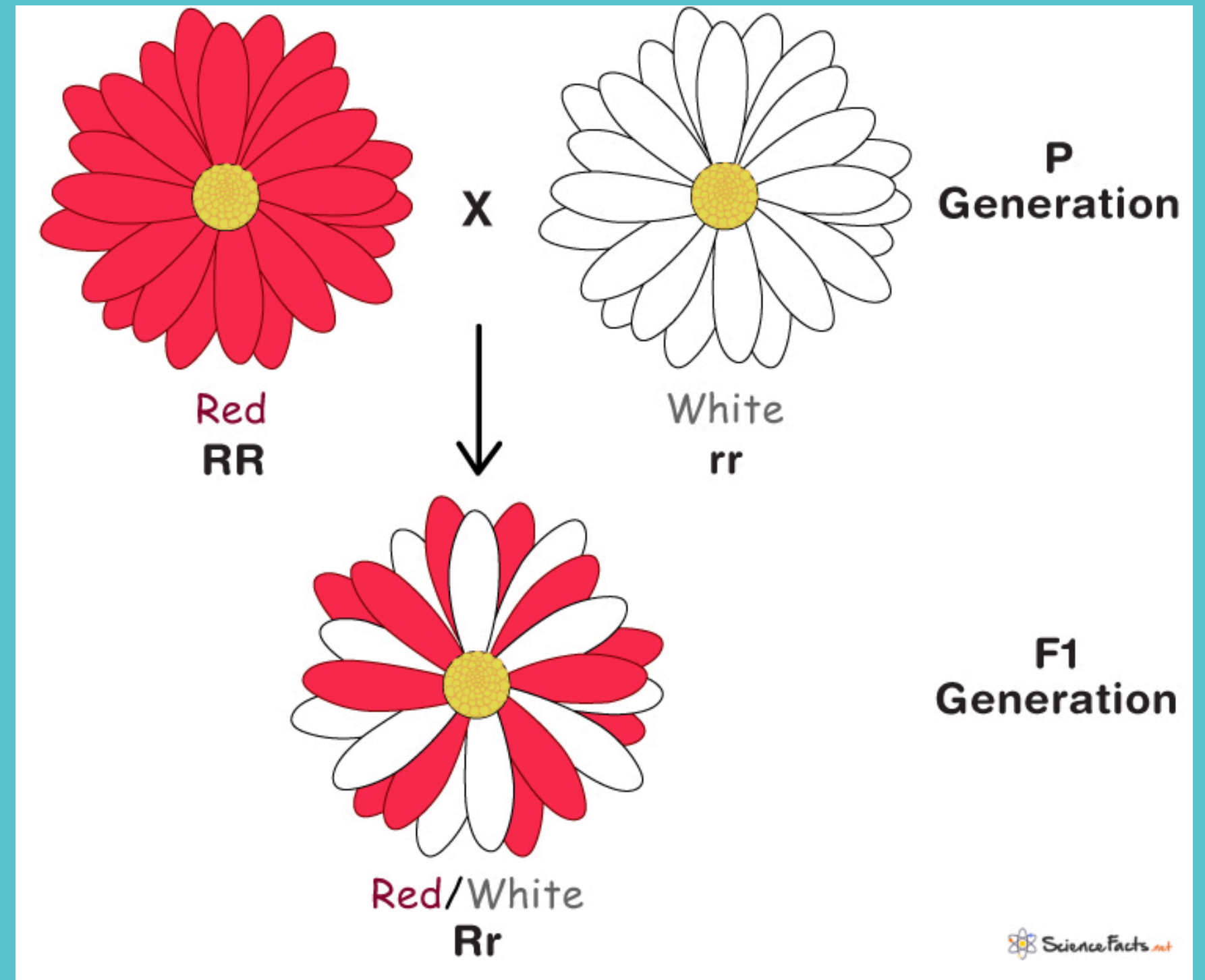
CO-DOMINANCE

Give definition







CO-DOMINANCE

- Both alleles in heterozygous individuals express their traits fully.



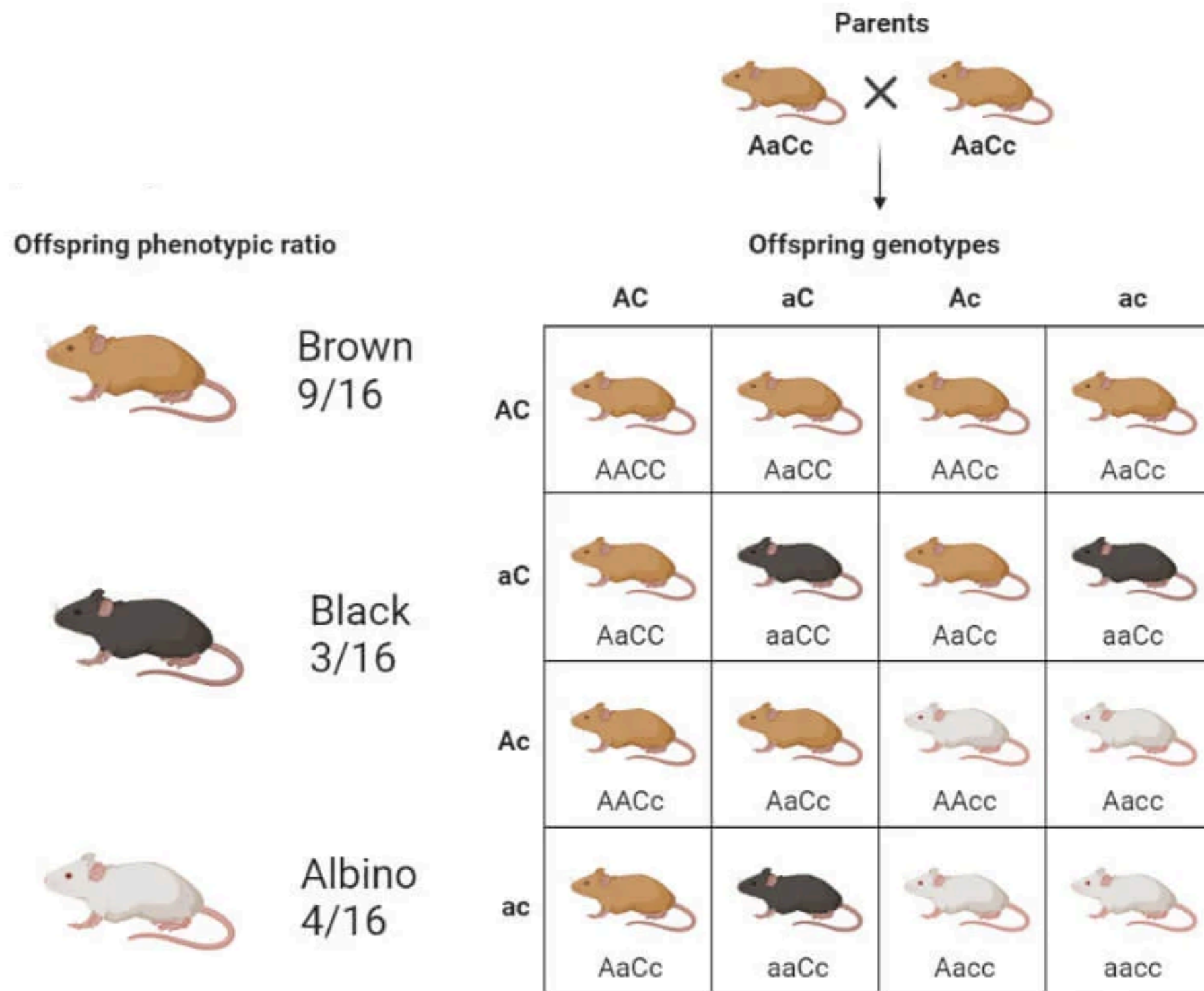
CO-DOMINANCE

- Both alleles in heterozygous individuals express their traits fully.

Genotype	Phenotype
$I^A_ (I^A I^A \text{ or } I^A i)$	 Type A
$I^B_ (I^B I^B \text{ or } I^B i)$	 Type B
ii	 Type o
$I^A I^B$	 Type AB

Blood types

EPISTASIS



Coat color in mice

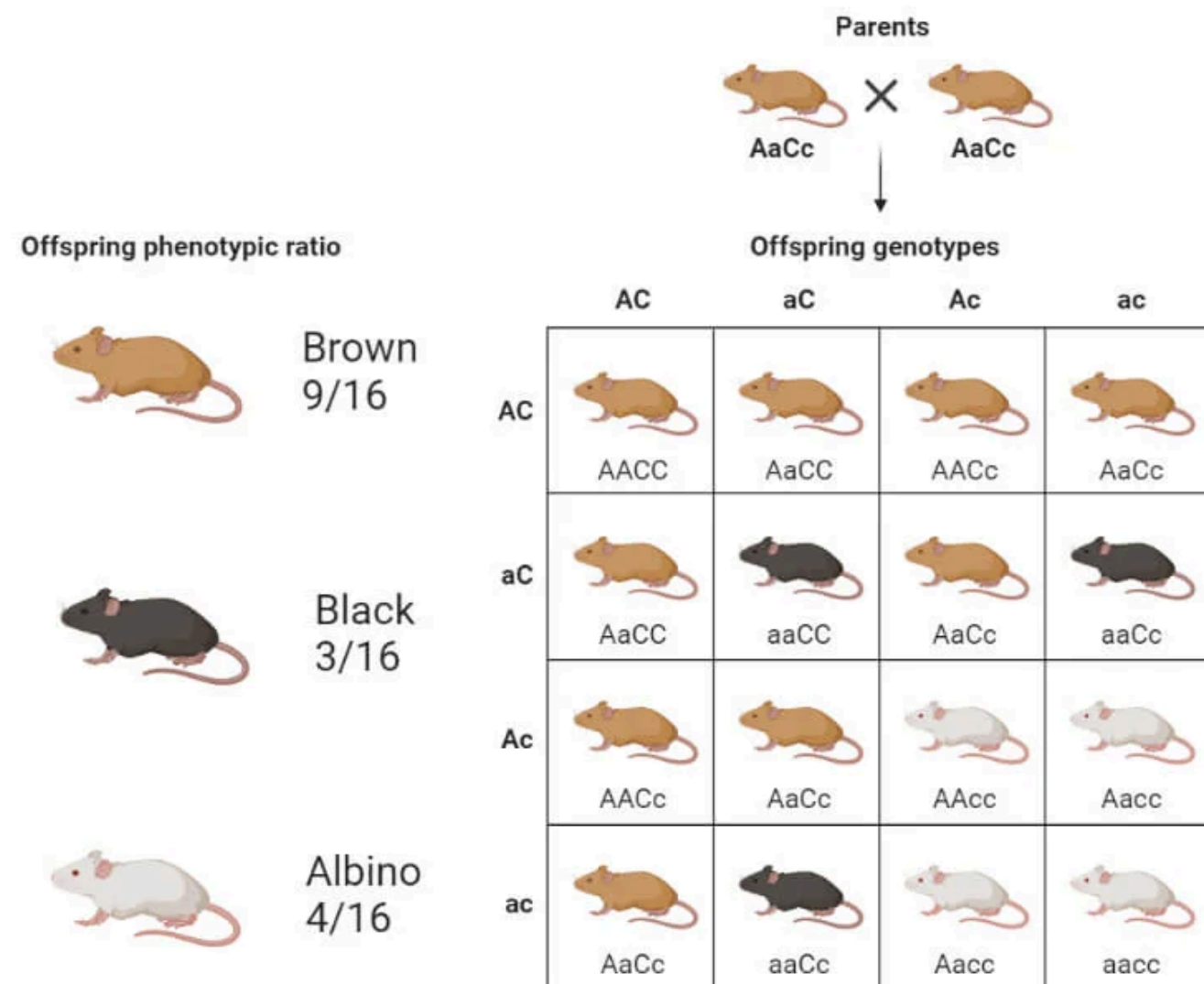
A= brown (dominant)

a= black (recessive)

C= pigment (dominant)

c= no pigment (recessive)

EPISTASIS



Coat color in mice

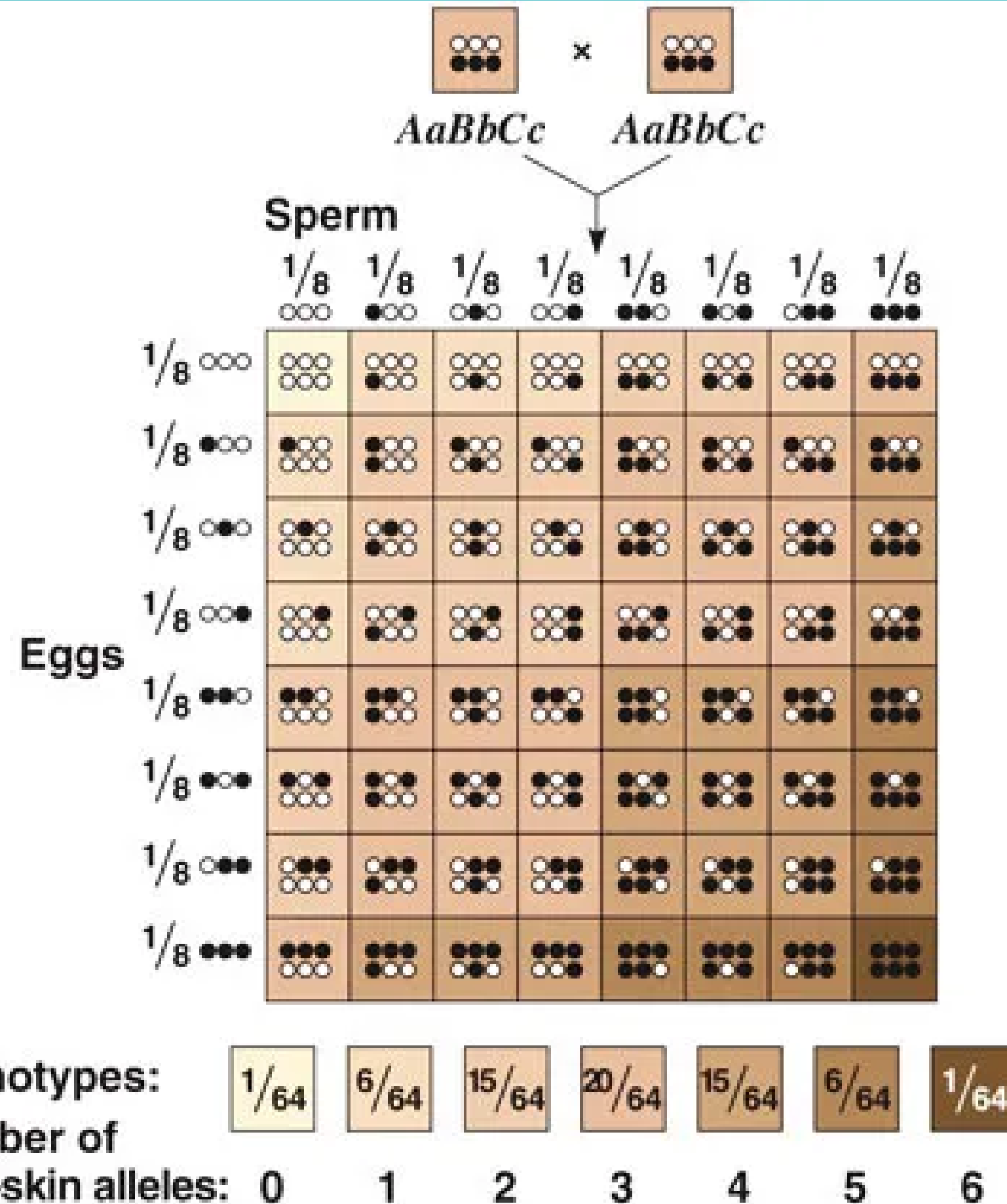
A= brown (dominant)

a= black (recessive)

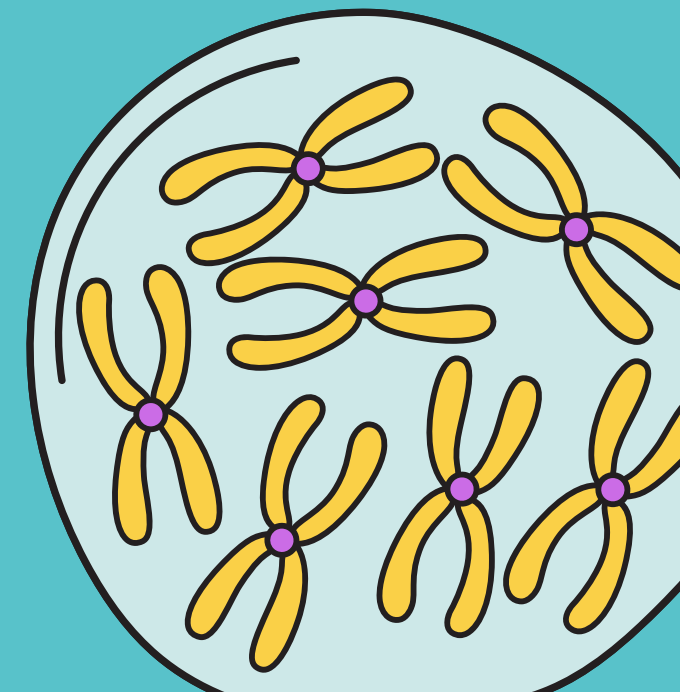
C= pigment (dominant)

c= no pigment (recessive)

One gene can
mask or
suppress the
expression of
another gene

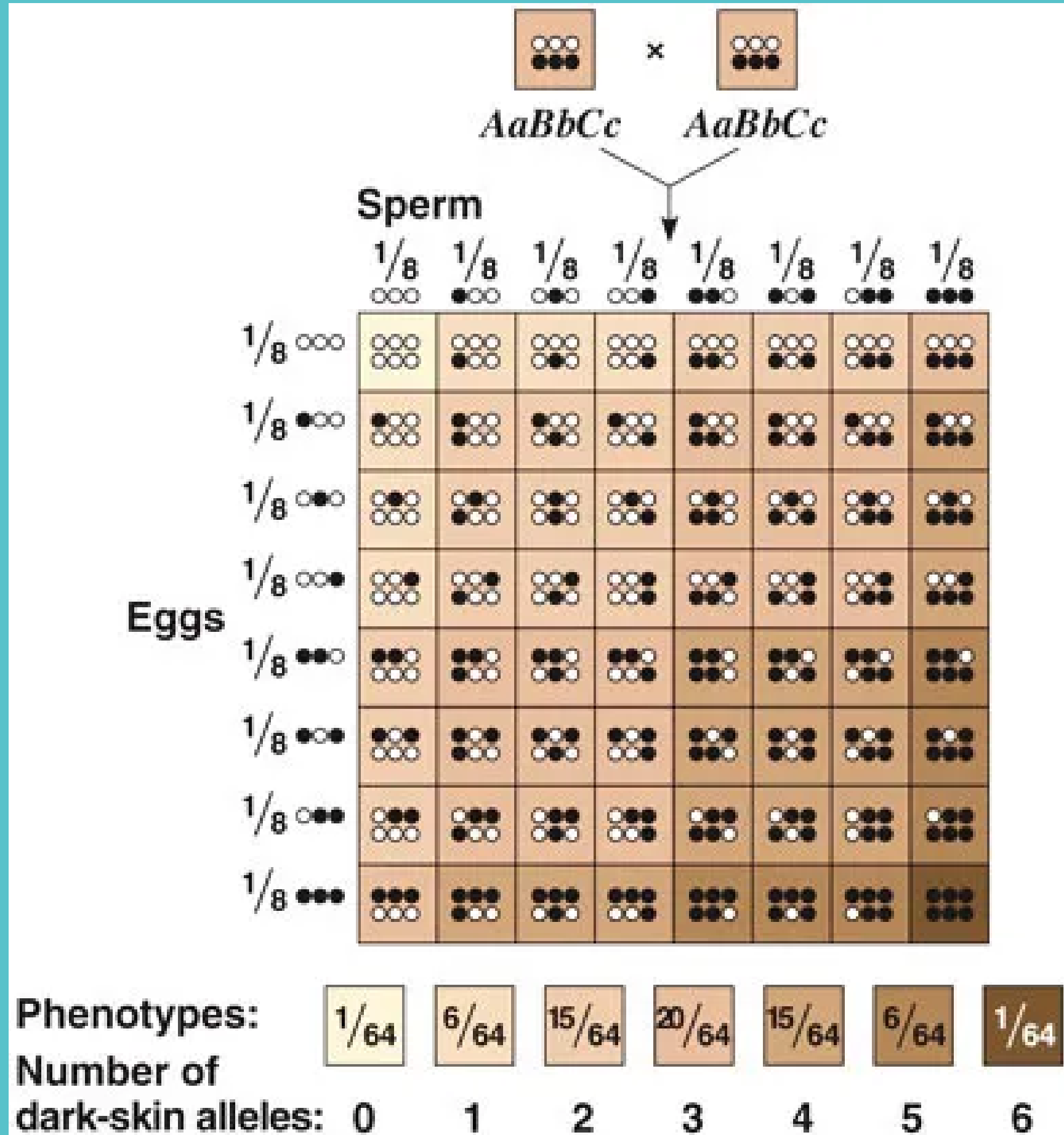
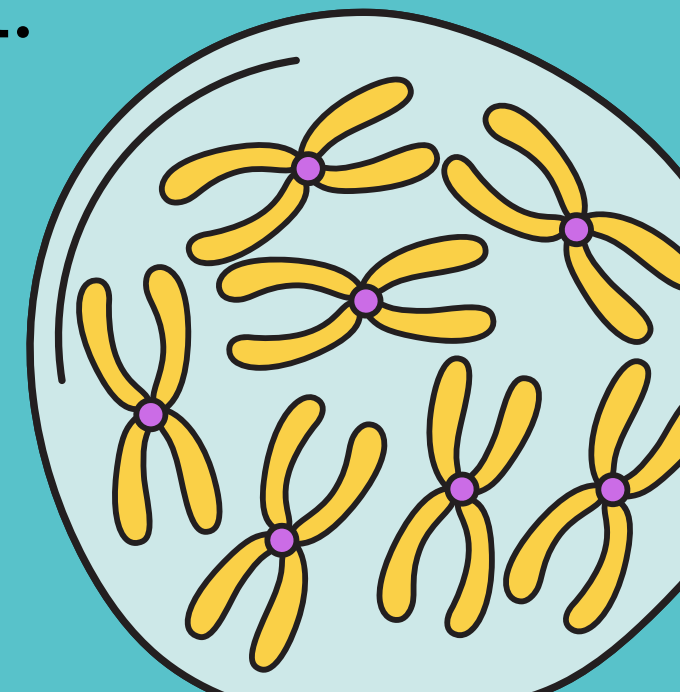


POLYGENIC INHERITANCE



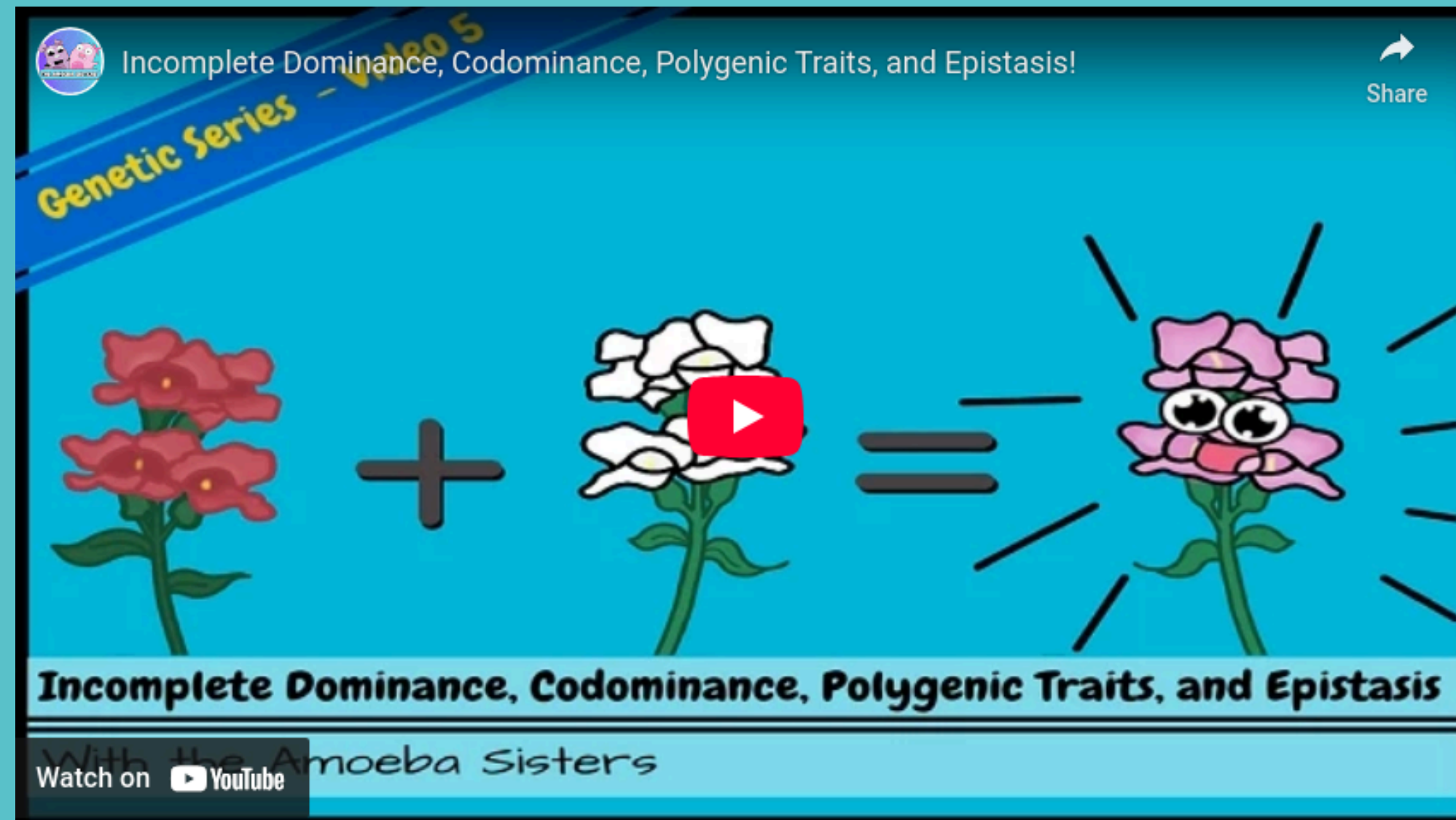
POLYGENIC INHERITANCE

Traits controlled by multiple genes, each contributing a small effect.



EXPLANATION

<https://www.youtube.com/watch?v=YJHGfbW55lO>

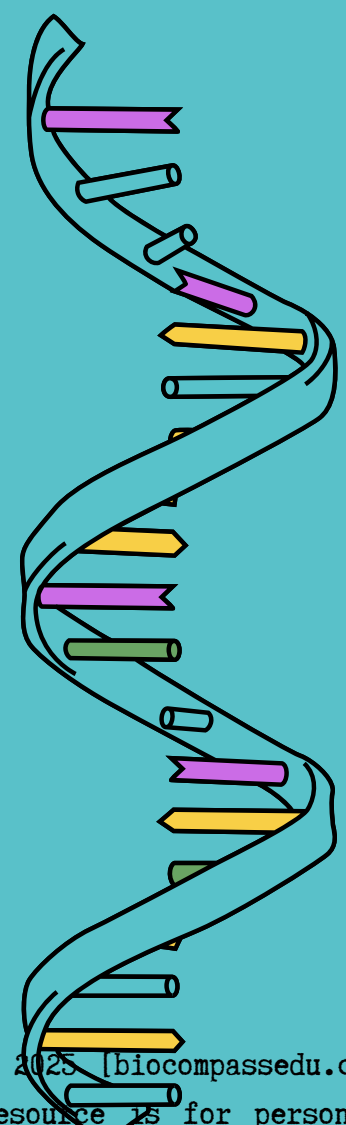


ELABORARTE

1. Form a group with your classmates and receive your assigned genetic scenario.
2. Work together to complete the assigned tasks and discuss your observations.
3. Answer the discussion questions as a group.



EVALUATE

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- What is one new thing you learned about genetics today?
 - Which inheritance type do you think is most common in humans?
Why?
 - Which type of inheritance do you still find confusing?