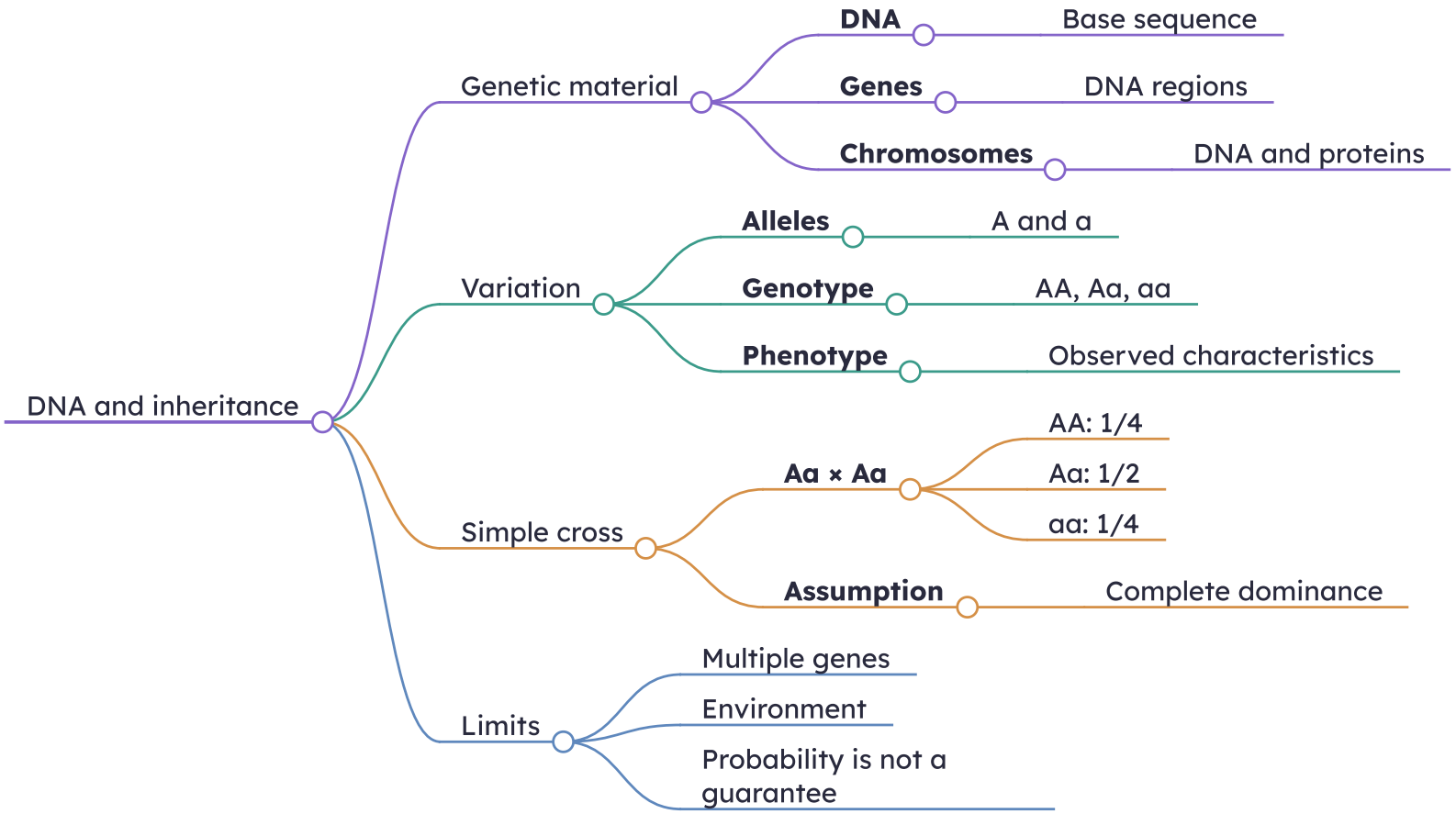
DNA and inheritance

Connect DNA, genes, chromosomes, alleles, and the limits of simple inheritance models.



Read one branch at a time. Then cover the details and explain them in your own words.

Understand the topic

DNA stores genetic information. Genes are DNA sequences contributing to functional products, and chromosomes package DNA with proteins. Alleles are variants at a locus. Many traits involve multiple genes and environmental influences. A single-gene cross is a useful model only when its assumptions fit the question.

How the map is organized

Move from genetic structures to variation and inheritance. Keep the model's assumptions visible.

> **Watch out for this**
> Dominant does not mean most common, strongest, or best.

Try it yourself

For Aa × Aa under complete dominance, list genotype probabilities. Explain why four offspring are not guaranteed to match the ratio exactly.

Two questions to answer

What is the probability of aa in Aa × Aa?

One of the four equally likely allele combinations is aa.

Is a dominant allele always common?

Dominance describes an expression pattern, not population frequency.

Sources

openstax.org
https://openstax.org/books/biology-2e/pages/14-2-dna-structure-and-sequencing

openstax.org
https://openstax.org/books/biology-2e/pages/12-1-mendels-experiments-and-the-laws-of-probability

Original practice material compiled by Studera.ai. Explore at studera.ai/en/resources/mind-map-examples.

DNA and inheritance · in detail

Every detail from the map in reading order. Follow the indentation to see which ideas belong together.

Genetic material

- DNA
  - Base sequence
- Genes
  - DNA regions
- Chromosomes
  - DNA and proteins

Variation

- Alleles
  - A and a
- Genotype
  - AA, Aa, aa
- Phenotype
  - Observed characteristics

DNA and inheritance · in detail

Every detail from the map in reading order. Follow the indentation to see which ideas belong together.

Simple cross

- Aa × Aa
  - AA: 1/4
  - Aa: 1/2
  - aa: 1/4
- Assumption
  - Complete dominance

Limits

- Multiple genes
- Environment
- Probability is not a guarantee