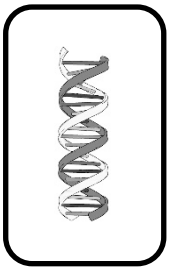
is a biomolecule

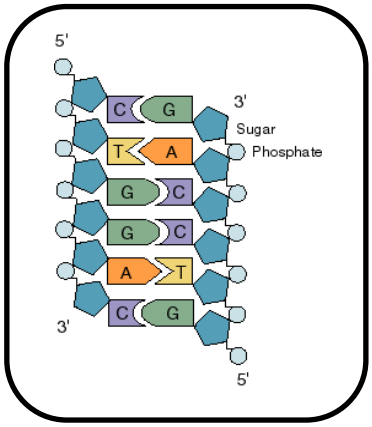
DNA (deoxyribonucleic acid)

acts as

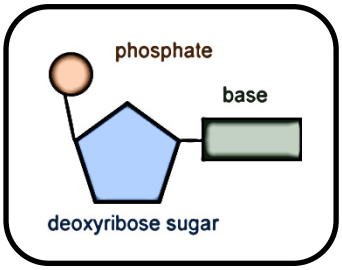


as blueprint for how living organisms are built

and



is made out of two long, twisted strands made of nucleotides

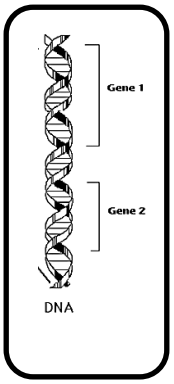


with

complementary base pair sequences

(A with T and C with G)

A **gene** is a segment of DNA



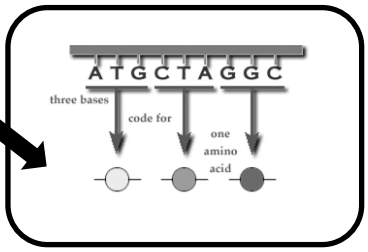
which

codes for a protein…..

which determines a trait / characteristic

because

the base sequence (triplet code) determines amino acid sequence



and

Mutations can alter the base sequence….

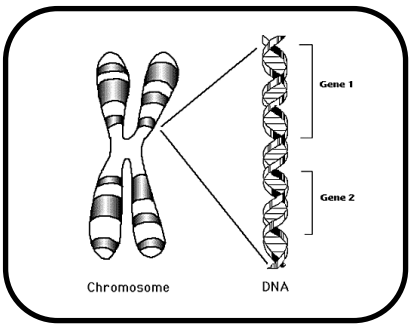
therefore

the protein made

which

determines the phenotype / characteristic / trait

A **chromosome**

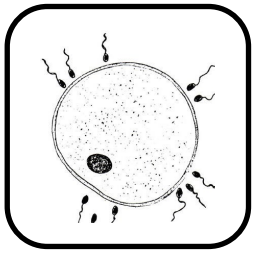


is

a structure which carries many genes

and

humans have 23 pairs of chromosomes (2n).



inheriting

one set (n) from the mother,

& the other set (n) from the father

VARIATION

means

differences between individuals

and is

environmental — and / or — genetic (inherited)

because

genetically unique gametes (sperm/egg & pollen/ova)

are

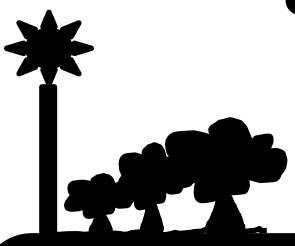
formed by **meiosis**

due to

crossing over &

independent assortment

during meiosis



Plant size may depend on light or water they get or minerals in the soil even if, genetically, they should ALL grow tall.

Sexual reproduction increases "shuffling" of (existing) alleles, caused by crossing over, independent assortment, and fertilisation.
These different combinations of alleles result in genetic diversity in the next generation.

AND

the random nature of <u>which</u> sperm fertilises <u>which</u> egg

(sexual reproduction)

mutation also can cause variation

Only mutations that occurred in a gamete can be inherited

BY

making new alleles

AND

variation

IS IMPORTANT

in a changing environment

temperature change, drought, floods, pollution, new diseases etc

The (changing) environment determines which variations are more favourable.
More favourable characteristics are passed on as those individuals survive to breed!

The genetic variations that arise in a population happen by chance, but the process of natural selection does not.

CAUSING

"better suited" individuals

to survive and pass on their genes

to the next generation

KNOWN AS

survival of fittest / natural selection

Individuals in a species show wide range of variation. Individuals with characteristics most suited to the environment are more likely to survive and reproduce. The genes that allow these individuals to be successful may be passed to their offspring.