

# Reproduction in Plants

- Asexual reprod → Definition
- Structure and function of parts of flower:

- Petal
- stamen : anther + filament
- carpel : ovary, stigma, style
- Pedicel
- sepal
- receptacle

- Pollination → Definition

↓  
**CROSS**

↓  
different plant  
+ Adv./Disadv.

↓ **self** → !! not asexual reproduction!! ↓

within same plant  
+ Adv./Disadv. + features favouring self-polln:

pollination occurs before fertilisation  
∴ don't confuse self-pollination is asexual reprod.

compare features

**wind**

**insect**

- pollen grains TB eg
- petals (grass flower)
- stamens
- stigma
- nectar
- scent

name of one eg (Hibiscus) or TB eg.

- anthers & stigma mature at different times
- position of stigma above/away from anthers
- flowers are not fully open

# • Process of fertilisation



↳ definition

- pollen grain germinates in response to sugary fluid produced by mature stigma
- enzymes produced by pollen tube digest tissues of stigma, style, wall of ovary for pollen tube to grow
- tip of pollen tube absorbs sap from surrounding cells of micropyle and burst to release male gamete into ovule
- male gamete fuses with female gamete / egg to form zygote → fertilisation

# Reproduction in Humans

## • Structure and function of parts of

sperm

&

egg

↓ head (acrosome),  
middle piece,  
↓ tail

has many mitochondria

↓ outer membrane

## • Structure and function of parts of male reprod. system

- penis  
- testis  
- sperm duct

- epididymis  
- scrotum  
- seminal vesicle

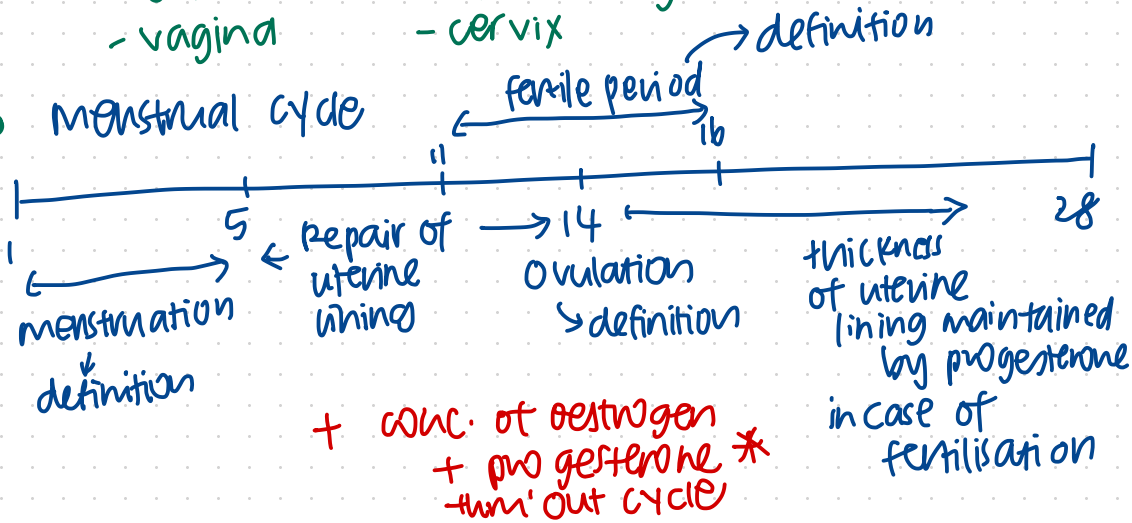
- Cowper's gland  
- prostate gland  
- urethra

## • Structure and function of parts of female reprod. system

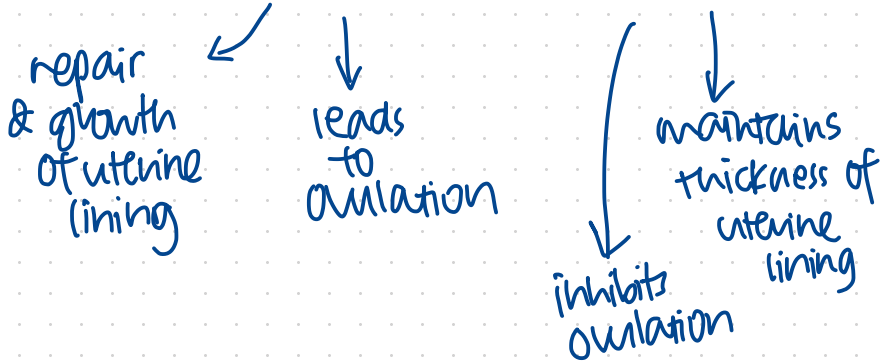
- Ovary  
- oviduct  
- vagina

- uterus  
- uterine lining  
- cervix

## • Menstrual cycle



- functions of oestrogen, progesterone



- If fertilisation occurs,  
- early development of embryo

implantation → definition

- role of corpus luteum: secreting oestrogen & progesterone
- embryonic villi + uterine lining

fn. (exchange of materials) → Oxygen, glucose vs. Carbon dioxide, urea

- umbilical cord → contains umbilical arteries & vein } Functions
- amniotic sac + fluid → functions

- AIDS — stands for Acquired Immune Deficiency Syndrome
  - caused by human immunodeficiency virus
- symptoms
- modes of transmission
- prevention

## molecular Genetics

- Structure & function of DNA
  - \* rule of complementary base pairing
- Relationship b/w DNA, gene, chromosome
  - ↙ definition
  - definition
- Chromosomes are tightly coiled chromatin threads which consist of DNA wrapped around histone proteins.  
Segments of DNA are called genes which code for the synthesis of polypeptides.

basic unit:  
nucleotide  
→ structure

# • Transcription and Translation

Definitions  
+ where they take place in a cell

## • mRNA vs DNA

- single-strand
- temporary
- 'uracil' instead of 'thymine'

• codon : 3 bases  
on mRNA  
coding for  
one amino  
acid

## • Genetic engineering <sup>definition</sup>

→ transferring human insulin gene into bacteria

- isolate
- restriction enzymes

← key-words

know the steps! →

- complementary sticky ends
- DNA ligase → definition
- recombinant plasmid (E. coli)
- heat shock treatment
- transgenic bacteria

→ definition

} Apply to other scenarios.

- Adv. vs. Disadv. of genetic engineering  
→ social, ethical issues \*

# Heredity

- Drawing genetic diagrams (see other resource)

- keywords:
  - Heterozygous
  - Homozygous
  - Dominant
  - Recessive
  - alleles
  - genotype
  - phenotype

Definitions.

- Expected ratios : 3:1 (Hetero x Hetero)  
1:1 (Hetero x Homd recessive)  
All Dominant (Homo dominant x Homo recessive)

- mutation

→ Definition

Mutagens  
+ eggs →

α - radiation  
γ -  
ultraviolet

chemical:  
formaldehyde,  
mustard gas

- Down's syndrome

→ Change in  
chromosome  
number

- 47, instead  
of 46

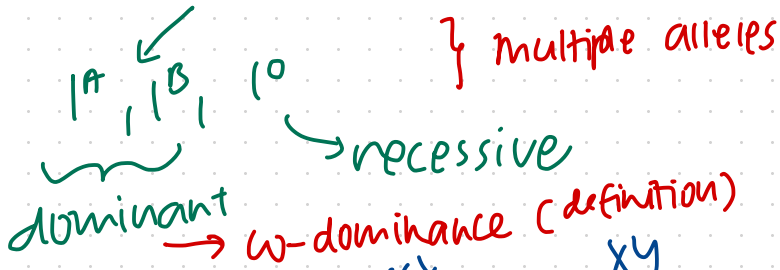
- additional  
chromosome  
21

- sickle cell  
anemia

- Albinism

change in gene  
structure ← ←

- Human ABO blood groups




- sex determination:  $XX$  female,  $XY$  male


- Variation: continuous vs. Discontinuous

eg: height, skin colour, foot length

definition



eg: ABO Blood Grp, Gender, Eye colour



distinct, few categories / phenotypes

- Natural Selection
  - definition
  - evolution
  - better adapted to survive
  - reproduce
  - pass down favourable genes to offspring / next gen.
- Artificial selection
  - always benefit humans!