

CAIE Biology IGCSE

16 - Reproduction

Flashcards

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What is asexual reproduction?



What is asexual reproduction?

The production of two genetically identical offspring from one parent



Give one advantage and one
disadvantage of asexual reproduction
(Higher/Supplement)



Give one advantage and one disadvantage of asexual reproduction (**Higher/Supplement**)

Advantage - It produces lots of offspring quickly

Disadvantage - It does not introduce variation and so all offspring are susceptible to the same environmental pressures as the parents



What is sexual reproduction?



What is sexual reproduction?

The production of genetically different offsprings from the fusion of the nuclei from two different gametes



Define fertilisation



Define fertilisation

The fusion of the nuclei from two gametes (sex cells)



State the difference in the number of chromosomes in a gamete nucleus compared with a zygote nucleus
(Higher/Supplement)



State the difference in the number of chromosomes in a gamete nucleus compared with a zygote nucleus (**Higher/Supplement**)

Gametes have haploid nuclei (23 chromosomes) whereas zygotes have diploid nuclei (23 **pairs** of chromosomes)



Give one advantage and one
disadvantage of sexual reproduction
(Higher/Supplement)



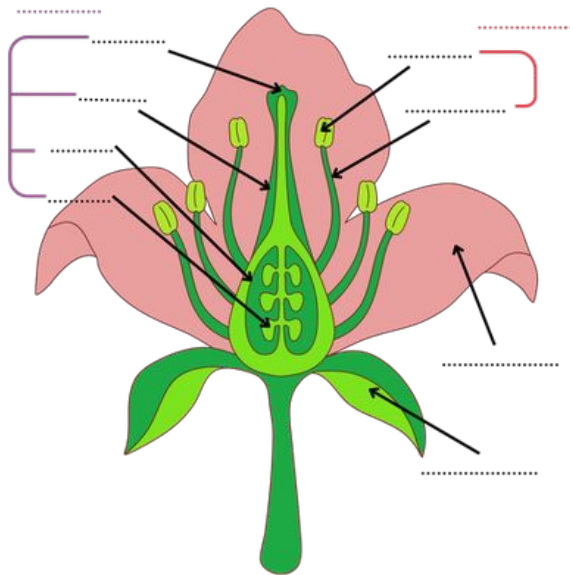
Give one advantage and one disadvantage of sexual reproduction (**Higher/Supplement**)

Advantage - It introduces variation

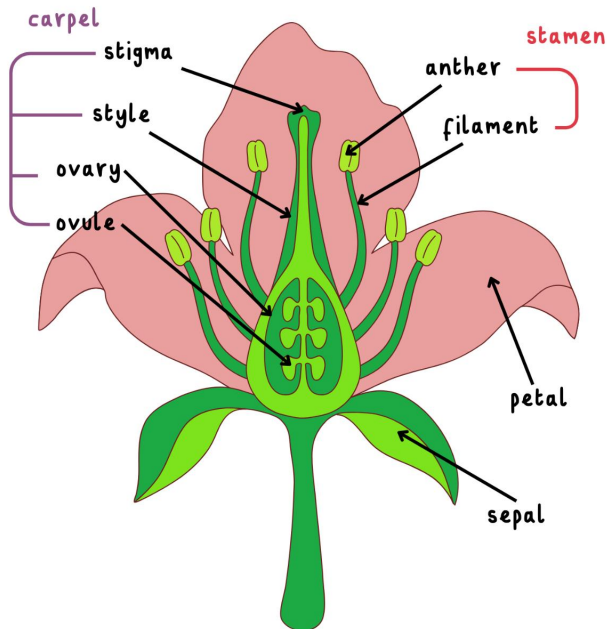
Disadvantage - It is slower and produces a limited amount of offspring



Label the insect pollinated flower below



Label the insect pollinated flower below



What is the function of the sepals in an insect pollinated plant?



What is the function of the sepals in an insect pollinated plant?

The sepal is a hard coating that protects the developing flower in a bud



What is the function of the petals in an insect pollinated plant?



What is the function of the petals in an insect pollinated plant?

The petals attract the insects so that they can pollinate the plant



What is the function of the anthers in an insect pollinated plant?



What is the function of the anthers in an insect pollinated plant?

The anthers contain the pollen sacs which contain the male sex cells of the plant



What is the function of the stigma in an insect pollinated plant?



What is the function of the stigma in an insect pollinated plant?

These are the sticky parts of the plant designed to capture the pollen grains



What is the function of the ovaries in an insect pollinated plant?

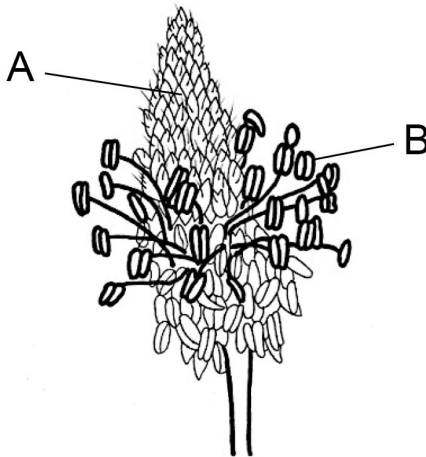


What is the function of the ovaries in an insect pollinated plant?

They contain ovules which will grow into seeds when they are fertilised by pollen



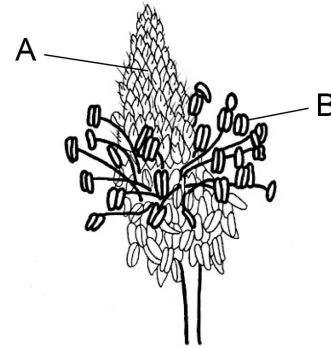
Label the diagram of a wind pollinated plant below



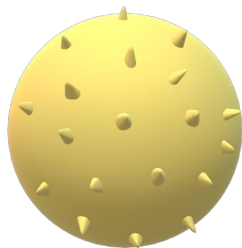
Label the diagram of a wind pollinated plant below

A - Stigma

B - Anthers



What type of pollen grain is this and why?

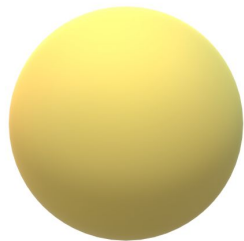


What type of pollen grain is this and why?

Pollen from an insect pollinated as it has spikes on it to make it sticky to be picked up by insects



What type of pollen grain is this and why?



What type of pollen grain is this and why?

Pollen from a wind pollinated as it is smooth so that it can be carried by the wind easily



State four differences between pollen grains of wind-pollinated flowers and insect-pollinated flowers



State the four differences between pollen grains of wind-pollinated flowers and insect-pollinated flowers

Pollen grains of wind-pollinated flowers	Pollen grains of insect-pollinated flowers
Smaller in diameter	Larger in diameter
Lighter in weight	Heavier in weight
Greater number of grains produced	Fewer number of grains produced
No spikes or hooks	Contains spikes or hooks



What is pollination?



What is pollination?

Where pollen grains are transferred from the anthers to the stigma



What is self-pollination? (Higher/Supplement)



What is self-pollination? (Higher/Supplement)

Where pollen grains are transferred from the anthers to the stigma **of the same plant**



What is cross-pollination? (Higher/Supplement)



What is cross-pollination? (Higher/Supplement)

Where pollen grains are transferred from the anthers of one plant to the stigma of another plant of the same species



Give one advantage of self-pollination
(Higher/Supplement)



Give one advantage of self-pollination
(Higher/Supplement)

There is a greater chance of fertilisation
as it does not rely on pollinators



Give one disadvantage of self-pollination
(Higher/Supplement)



Give one disadvantage of self-pollination
(Higher/Supplement)

Genetic variation decreases and the plant is less able to adapt to the environment



Give one advantage of cross-pollination
(Higher/Supplement)



Give one advantage of cross-pollination
(Higher/Supplement)

The plants are more able to adapt to environmental changes and there is increased genetic variation



Give one disadvantage of
cross-pollination
(Higher/Supplement)



Give one disadvantage of cross-pollination
(Higher/Supplement)

The plants are reliant on insect
populations for fertilisation



Describe what happens when a pollen grain lands on the stigma of a plant
(Higher/Supplement)



Describe what happens when a pollen grain lands on the stigma of a plant (**Higher/Supplement**)

- A pollen tube grows through the style to reach the ovule in the ovary
- The nucleus from the pollen grain then travels down the pollen tube to reach the ovule



When does fertilisation occur in plants?



When does fertilisation occur in plants?

When the nucleus of a pollen grain fuses with the nucleus of an ovule



State four differences in structural adaptations between insect-pollinated flowers and wind-pollinated flowers



State four differences in structural adaptations between insect-pollinated flowers and wind-pollinated flowers

Insect-Pollinated flowers	Wind-pollinated flowers
Large, bright and scented petals	Small, dull and non-scented petals
Sticky stigmas	Stigma is outside the flower and feathery
Nectar is produced	Nectar is not produced
Anthers are inside the flower and firmly attached	Anther is outside the flower and hangs loosely



State 3 environmental conditions that affect seed germination



State 3 environmental conditions that affect seed germination

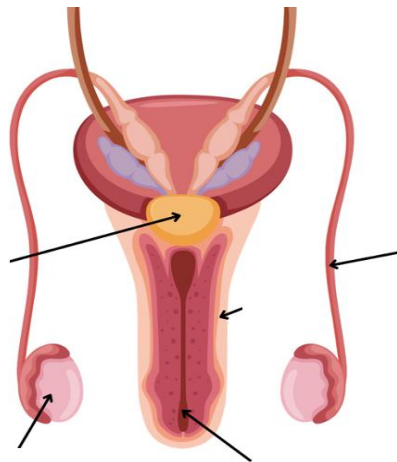
Oxygen availability

Water availability

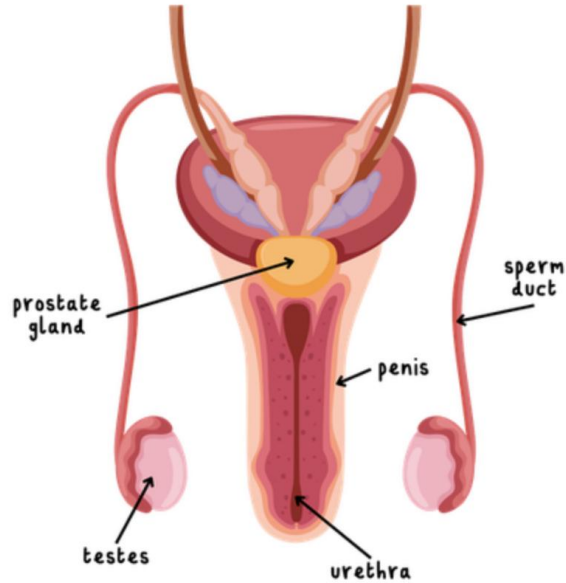
A suitable temperature



Label the following diagram of the male reproductive system



Label the following diagram of the male reproductive system



State 2 functions of the testes



State 2 functions of the testes

- They produce hormones
- They produce sperm



State 2 functions of the penis



State 2 functions of the penis

- Used as the male sex organ
- Used as an excretory organ



State 2 functions of the male urethra



State 2 functions of the male urethra

- It allows urine to exit the body from the bladder
- It is used during ejaculation to release semen



State the function of the scrotum



State the function of the scrotum

It holds and protects the testes



State the function of the sperm duct



State the function of the sperm duct

It carries sperm from the testes to the urethra



State the function of the prostate gland

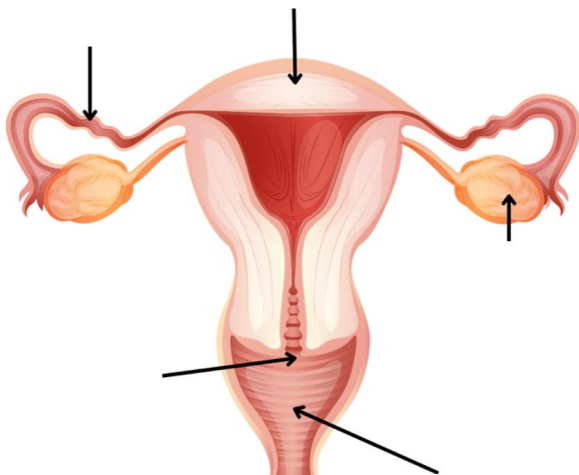


State the function of the prostate gland

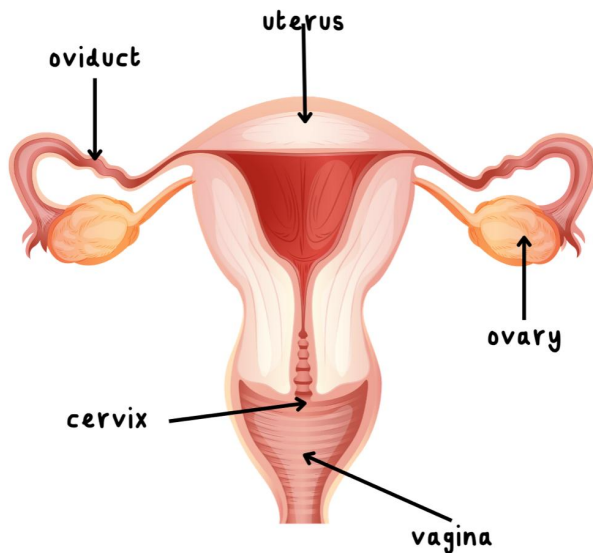
It produces prostate fluid which combines with sperm cells to make sperm



Label the following diagram of the female reproductive system



Label the following diagram of the female reproductive system



State 2 functions of the ovaries



State 2 functions of the ovaries

- They produce eggs
- They produce hormones



State 2 functions of the vagina



State 2 functions of the vagina

- To receive the penis during intercourse
- It is used as the birth canal during childbirth



State the function of the oviduct



State the function of the oviduct

To create a passage between the ovary and the uterus for the egg to travel down



State 2 functions of the cervix



State 2 functions of the cervix

- To allow menstrual blood to flow out of the vagina
- To channel the sperm into the uterus



Define fertilisation



Define fertilisation

The fusion of the nucleus of a male gamete with the nucleus of a female gamete



Compare sperm and egg cells in terms of size



Compare sperm and egg cells in terms of size

Sperm cells are significantly smaller than egg cells

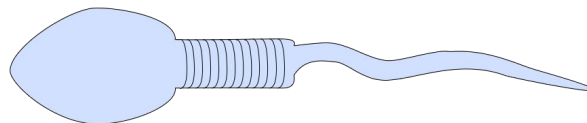
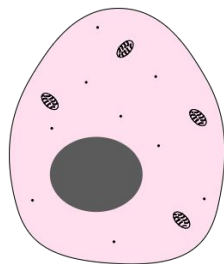


Compare sperm and egg cells in terms of structure and shape



Compare sperm and egg cells in terms of structure and shape

Sperm cells are long and thin with a head and tail whereas egg cells are large and in the shape of a sphere or ovoid



Not to scale



Compare sperm and egg cells in terms of their ability to move



Compare sperm and egg cells in terms of their ability to move

- Sperm cells have large energy stores and a long tail to help them to move quickly
- Egg cells do not have this and so are relatively non-motile



Compare sperm and egg cells in terms
of the number of each cell



Compare sperm and egg cells in terms of the number of each cell

- There are many more sperm cells than egg cells (up to 100 million sperm per millilitre of ejaculate).
- There is only one egg which is released from the ovary per month (from puberty to menopause).



State 2 adaptive features of sperm cells



State 2 adaptive features of sperm cells

- Long flagellum
- Contain enzymes



Explain 3 adaptive features of sperm cells



Explain 3 adaptive features of sperm cells

- Lots of mitochondria in the middle section provide energy for movement
- Enzymes in the acrosome break down the outer membrane of the egg
- Long whip-like flagellum used for movement



State 2 adaptive features of egg cells



State 2 adaptive features of egg cells

- Large energy stores
- Jelly-like coat



Explain the 2 adaptive features of egg cells



Explain the 2 adaptive features of egg cells

- Large energy stores allow for lots of cell divisions and growth
- Jelly-like coat ensures that only one sperm can fertilise the egg as it changes after fertilisation



Briefly describe the early development of an embryo



Briefly describe the early development of an embryo

- After fertilisation a zygote is formed
- The zygote implants in the uterus wall and becomes an embryo



What is the function of the umbilical cord?



What is the function of the umbilical cord?

- It delivers oxygenated blood and nutrients to the developing foetus
- It removes deoxygenated blood and waste products from the developing foetus



What is the function of the placenta?



What is the function of the placenta?

- It separates the mother's blood supply from the foetus' blood supply
- It also allows for exchange between the mother and foetus
- To act as a barrier for toxins and pathogens



What is the function of the amniotic sac
and amniotic fluid?



What is the function of the amniotic sac and amniotic fluid?

They help to protect the developing foetus



How can certain toxins and pathogens
be harmful to the developing foetus?
(Higher/Supplement)



How can certain toxins and pathogens be harmful to the developing foetus? (Higher/Supplement)

The toxins and pathogens can pass across the placenta and can damage the foetus



Name one toxin that can affect a
developing foetus
(Higher/Supplement)



Name one toxin that can affect a developing foetus
(Higher/Supplement)

Nicotine found in cigarette smoke



Name one pathogen that can affect a
developing foetus
(Higher/Supplement)



Name one pathogen that can affect a developing foetus (Higher/Supplement)

The rubella virus



What role does testosterone play during puberty?



What role does testosterone play during puberty?

- Triggers growth and development of the penis and testes
- Causes the voice to deepen
- Triggers the growth of pubic hair
- Increases muscle mass



What role does oestrogen play during puberty?



What role does oestrogen play during puberty?

- Increases breast size
- Triggers the development of the uterus
- It causes eggs to mature during the menstrual cycle



Where is oestrogen secreted from?
(Higher/Supplement)



Where is oestrogen secreted from?
(Higher/Supplement)

The ovaries



Where is progesterone secreted from?
(Higher/Supplement)



Where is progesterone secreted from?
(Higher/Supplement)

The ovaries



What happens on day 1-4 of the menstrual cycle?



What happens on day 1-4 of the menstrual cycle?

The uterus lining is shed during menstruation

Menstruation	Uterus lining growth	Lining maintained
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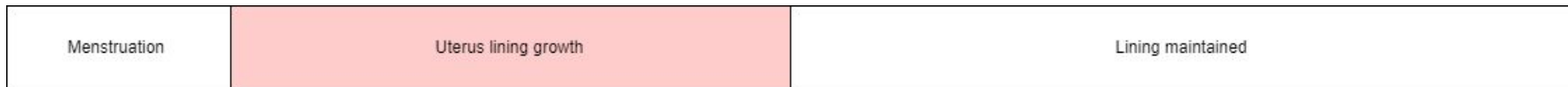


What happens on day 4-14 of the menstrual cycle?



What happens on day 4-14 of the menstrual cycle?

The uterus lining then begins to grow again in preparation to receive an egg

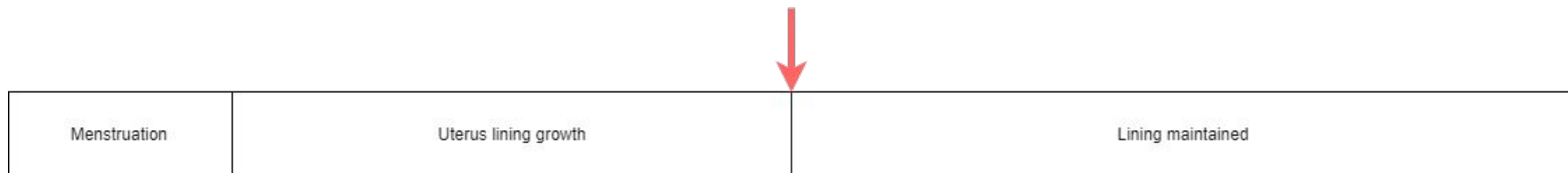


What happens on day 14 of the menstrual cycle?



What happens on day 14 of the menstrual cycle?

An egg is released



What happens on day 14-28 of the menstrual cycle?



What happens on day 14-28 of the menstrual cycle?

The lining of the uterus is maintained



What does follicle stimulating hormone (FSH) do? (Higher/Supplement)



What does follicle stimulating hormone (FSH) do?
(Higher/Supplement)

FSH stimulates the follicle to mature and release oestrogen



What does luteinising hormone (LH) do? (Higher/Supplement)



What does luteinising hormone (LH) do?
(Higher/Supplement)

A surge in LH causes the release of an egg from the ovary (ovulation)



What does progesterone do? (Higher/Supplement)



What does progesterone do? (Higher/Supplement)

Progesterone maintains the womb lining



What hormone does progesterone
inhibit?
(Higher/Supplement)



What hormone does progesterone inhibit?
(Higher/Supplement)

Progesterone inhibits follicle stimulating hormone (FSH) and Luteinizing hormone (LH)



Define sexually transmitted infection (STI)

An infection caused by a pathogen that is transmitted through bodily fluids, usually involving sexual contact



Give an example of an STI



Give an example of an STI

HIV (Human Immunodeficiency Virus)



State 3 ways of preventing the spread of STIs



State 3 ways of preventing the spread of STIs

- Wearing condoms during sex
- Avoid having multiple sex partners
- Don't share needles



How is HIV spread?



How is HIV spread?

Through bodily fluids



What can HIV infection lead to?



What can HIV infection lead to?

AIDS (Acquired Immunodeficiency syndrome)



How does HIV affect the immune system?



How does HIV affect the immune system?

- Decreased lymphocyte numbers
- White blood cells have a reduced ability to produce antibodies

