

Chapter 3 – Reproduction In Animals

2 Methods

(1) Asexual = Only 1 Parent

Binary Fission

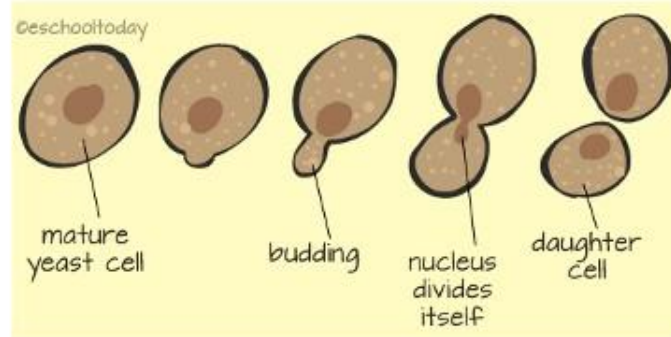


Paramecium



Amoeba

Budding



Eg: Yeast & Hydra

(2) Sexual = M + F Parent

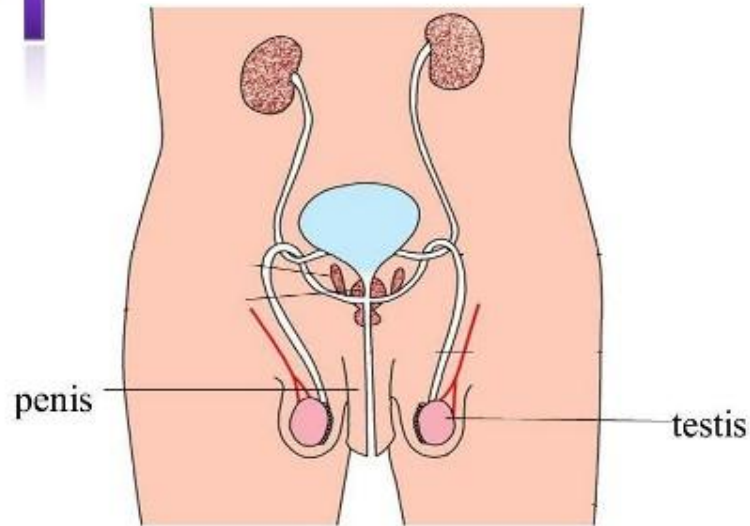
- M + F Parents
- Lay Eggs / Give Birth
- Sperm + Egg (fuses) → Fertilisation → Sexual Reproduction
- (1) Internal Fertilisation , (2) External Fertilisation
- All Sexual Production goes through Gestation Period
- Gestation = Development period from fertilisation to birth

Sexual Reproduction In Humans



1

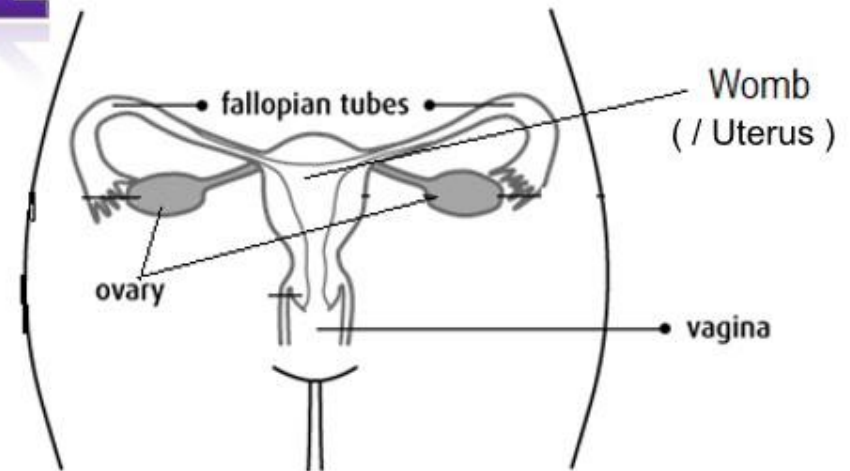
Male Reproductive System



- Testes & Penis
- Testes = Produce Sperms
- Penis = Release Sperms
- Sperms = Male Reproductive Cells

2

Female Reproductive System



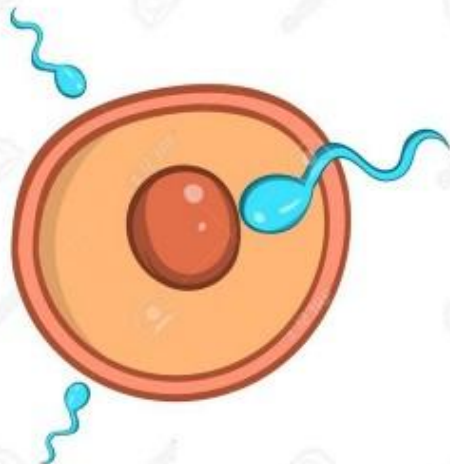
- Ovary, Fallopian Tubes, Womb & Vagina
- Vagina = Receive Sperms
- Ovaries = Release one egg a month
- Fertilisation → at Fallopian Tubes
- Fertilised Egg → Develop into a Foetus inside the Womb

Sexual Reproduction In Humans



3

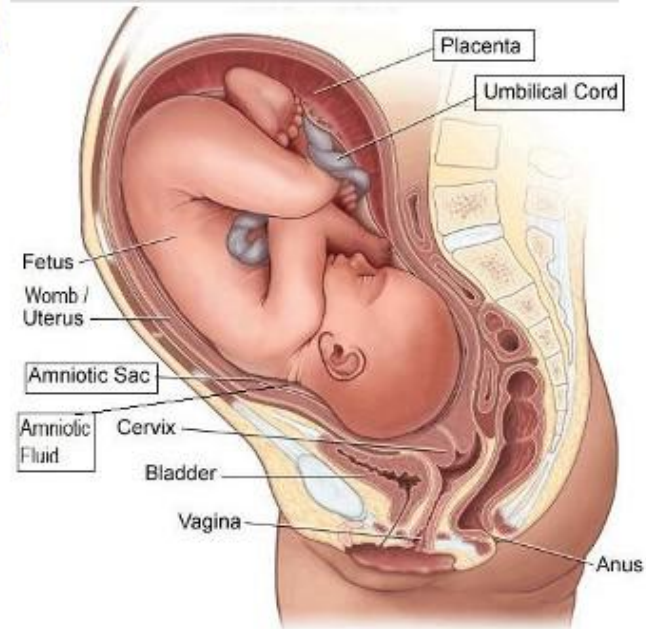
Fertilisation



- Fertilisation = 1 Sperm + 1 Egg fuses
- Sperms enter female's body, swim towards the fallopian tube to meet the egg
- Nucleus Egg fuse Nucleus Sperm
- Only 1 Sperm gets into the Egg
- The rest will die
- **Fertilised egg** move towards the **womb** and **develop into fetus**.

4

Development of Foetus



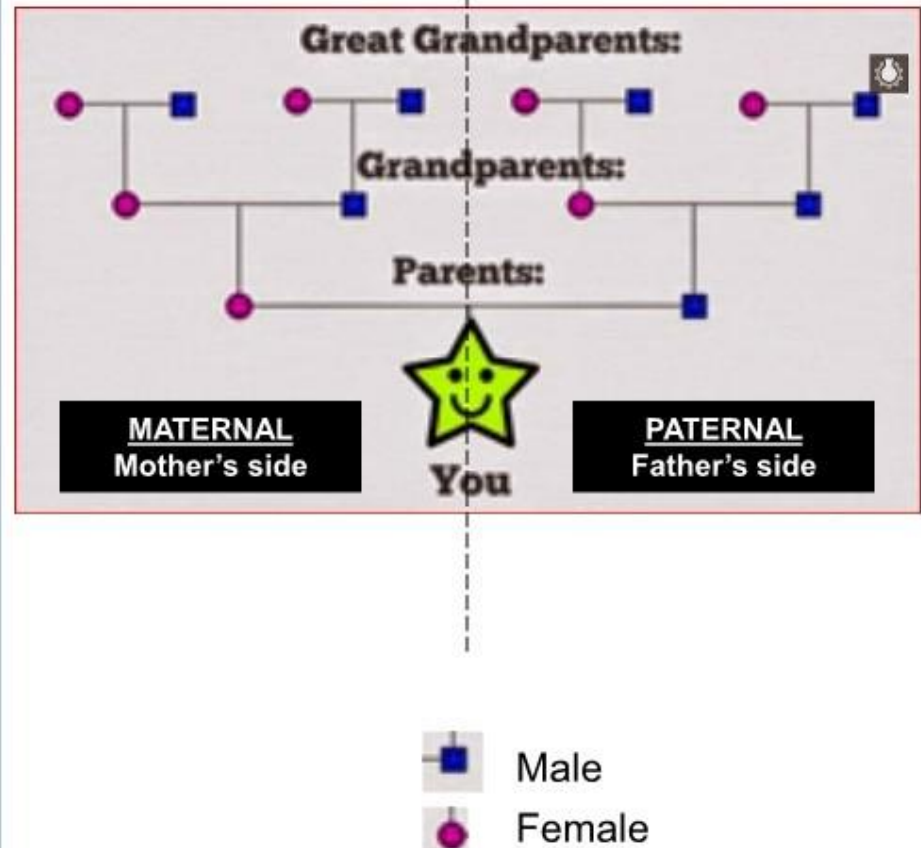
- 9 months to develop a baby
- Fetus surrounded by **AMNIOTIC FLUID** inside **AMNIOTIC SAC**
- **UMBILICAL CORD** connects to the mother
 - IN = Nutrients + O
 - OUT = Waste material + CO

Sexual Reproduction In Humans

HEREDITY

- Heredity = pass down characteristics from parents to children through their **genes**
- Sometimes not shown in 1 generation but will appear in the next generation
- Genes → found in NUCLEUS of Sperm cell + Egg cell
- Eg:
 - curly/straight hair
 - Colour skin, eyes or hair
 - Dimple, etc

FAMILY TREE





EXPERIMENTS

Experiment 1

Materials needed:

- 1 fertilised chicken egg
- 1 unfertilised chicken egg
- An incubator

Steps:

1. Place both eggs in an incubator set at 40°C.
2. Observe the eggs for 3 weeks.



Fertilised egg



Unfertilised egg



- What can be observed about the two eggs after 3 weeks?

The fertilised egg hatched into a chick while the unfertilised egg did not hatch into a chick.

- What can be concluded from this experiment?

Only fertilised eggs can develop into young.

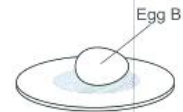
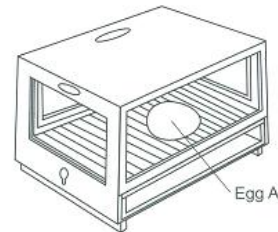
Experiment 2

Materials needed:

- 2 fertilised chicken eggs
- An incubator

Steps:

1. Put one egg on a plate at room temperature.
2. Put the other egg in an incubator set at 40°C.
3. Observe the eggs for 3 weeks.



- What can be observed about the eggs after 3 weeks?

Egg A hatched into a chick while Egg B did not hatch into a chick.

- Explain your observation.

Egg A was given the right temperature of 40°C that is needed for the chick to develop well while Egg B does not have the required amount of warmth for the chick to develop well.



WORKED EXAMPLES

Example 1

Study the animals given in the table below.

Group X	Group Y
Alligator	Salmon
Penguin	Toad

- (a) Suggest a suitable heading for Group X and Group Y. (1m)

Group X: _____

Group Y: _____

- (b) Explain what happens during fertilisation. (1m)



Thought Process:

Topic : Reproduction in animals

Key Concept(s) : There are two methods of fertilisation;
 • Internal fertilisation
 • External fertilisation

Fertilisation takes place when a sperm fuses with the egg.

Key Words / Key Phrases : (a) Internal fertilisation, External fertilisation

(b) sperm fuses with egg

Process Skills : Observing, Communicating, Classifying, Comparing, Inferring

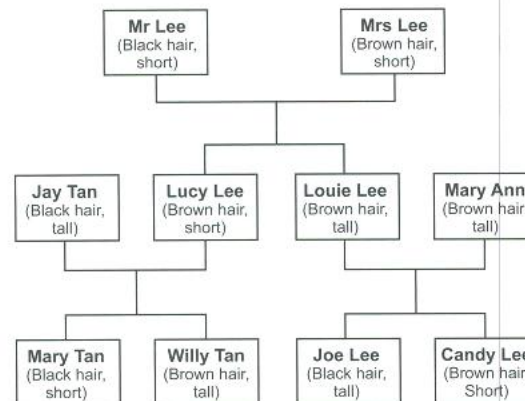
Answers:

- (a) Group X: **Internal fertilisation** (½m)
 Group Y: **External fertilisation** (½m)

- (b) During fertilisation, a **sperm fuses with the egg**. (1m)

Example 2

Study the family tree of the Lee family as shown below.



- a) Which characteristic(s) did Mary Tan inherit from her father? (1m)
- b) What could be the reason why Joe Lee has black hair when both his parents do not have black hair? (1m)
- c) How many cousins does Willy Tan have? (1m)



Thought Process:

Topic : Reproduction in animals

Key Concept(s) : Heredity is the passing down of characteristics from parents to their offspring through their genes

Some inherited characteristics may not show in one generation, but may reappear in the subsequent generation.

Key Words / Key Phrases : (a) black hair

(b) inherited from his paternal grandfather, through his father.

(c) 2

Process Skills : Observing, Communicating, Inferring, Analysing



WORKED EXAMPLES

Example 2 (Answers)

Answers:

- (a) **Black hair.** (1m)
- (b) He inherited the genes **from his paternal grandfather through his father.** (1m)
- (c) **2** cousins. (1m)

Example 3

The table below shows the gestation periods of five animals, P, Q, R, S and T.

Animal	Gestation period (week)	Average mass of newborn (kg)
P	6	0.25
Q	12	1.5
R	36	3.3
S	40	3.9
T	63	9.9

- (a) Based on the table above, what is the relationship between the gestation period and the average mass of a newborn? (1m)
- (b) State a possible animal for S. (1m)



Thought Process:

Topic : Reproduction in animals

Key Concept(s) : Gestation is the period of development from fertilisation to birth.

A fertilised egg takes about 9 months or 40 weeks to develop into a baby.

Key Words / Key Phrases : (a) longer gestation period, greater average mass of new born.

(b) human

Process Skills : Observing, Communicating, Inferring, Analysing, Generating possibilities

Answers:

- (a) The **longer the gestation period, the greater the average mass of the newborn.** (1m)
- (b) **Human.** (1m)