



3055 BA SANGAM COLLEGE

PH: 6674003/9264117 E-mail: basangam@connect.com.fj



WORKSHEET 20

School: Ba Sangam College

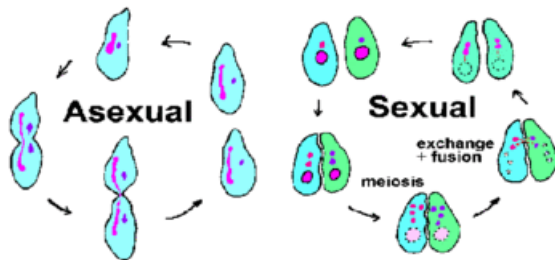
Subject: Biology

Year: 12

Name:

Strand	1 – Structure and Life Processes
Sub strand	1.4 – Comparative Form and Function in Plants and Animals
Content Learning Outcome	-Discuss asexual and sexual reproduction, external and internal fertilization, development and the factors that contribute to reproductive success in different organisms.

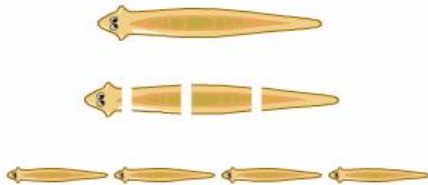
PROTISTS & ANIMALS: EVOLUTIONARY TRENDS IN REPRODUCTION



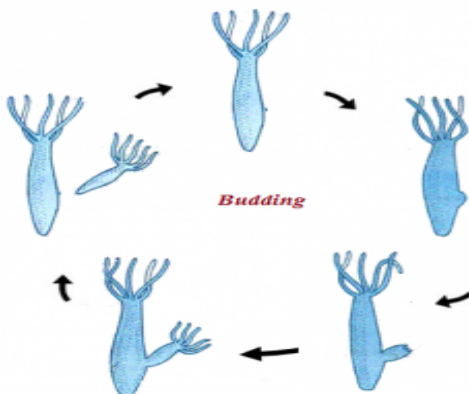
TYPES OF ASEXYAL REPRODUCTION

- (1) **Fragmentation**- breaking off pieces of their bodies which grow into new individuals.

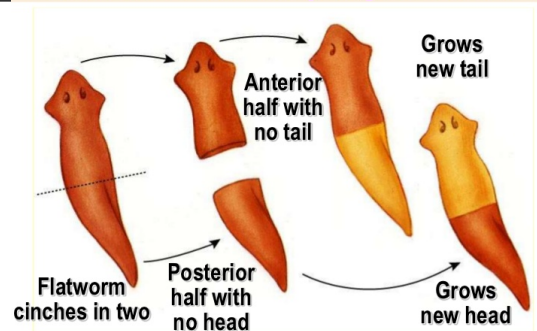
Example: Sponges, Flatworms and Sea stars



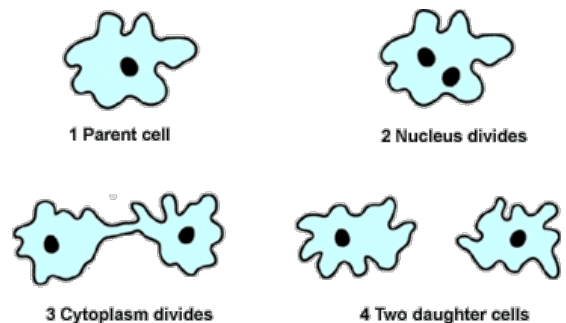
- (2) **Budding**– where new individuals bud off from their bodies. Example: Hydra



- (3) **Regeneration**- modified form of fragmentation. It is the natural ability of organisms to replace worn out parts, repair or renew damaged or lost parts of the body, or the whole body from a small fragment/piece of the body. Example: Sea stars and Flatworms.



- (4) **Binary Fission**-separation of the body into two new bodies. The organism duplicates its genetic material and then divides into two parts with each new organism receiving one copy of DNA. Example: Protists- Amoeba, Euglena and Paramecium. Animals- Tapeworms



Different strategies for sexual reproduction amongst animals

- (1) **External fertilisation**–male gametes fertilise (fuse with) the female gametes outside the body.



Limitations of External Fertilisation

1. Eggs and sperms released in water may not meet and therefore gametes and the energy invested in producing those gametes will be wasted.
2. This type of fertilisation can occur only in water.
3. Eggs released are soft and therefore vulnerable to predation. Therefore numerous eggs are laid to ensure that at least a few offspring will survive.

(3) **Internal fertilisation**-male gametes fertilise (fuse with) the female gametes inside the body.



Advantages of internal fertilization

- Water is not required
- Fewer gametes are produced to prevent wasting of energy in producing gametes

(3) **External development**- the embryo develops outside the mother's body.



Disadvantage of External Development

- Embryo extremely vulnerable to predators

Egg

- Contains yolk—provides nutrients for the developing embryo
- Terrestrial animals egg have hard shells to protect the embryo from dehydration
- Reptile egg shells are not hard; instead it is **flexible** but is still **tough** and **leathery** to prevent dehydration.
- The aquatic animals' eggs have a **jelly-like coating** because dehydration is not a problem for these eggs

(4) **Internal Development**- the embryo develops and is protected and nourished inside the mother's body.



Reproductive Success in Plants

Some of the reproductive successes in plants are attributed to:

1. Double fertilization- double fertilization in angiosperms leads to formation of endosperm which provides nourishment to the developing embryo.

2. Seed Dormancy- a mechanism to prevent germination during unsuitable ecological conditions, when the probability of seedling survival is low. Seeds delayed germination allows time for dispersal and prevents germination of all the seeds at the same time (reduces competition and ensures viability).

3. Dispersal Methods- via wind, water and animals.

Advantage of seed dispersal:

1. Reduces competition with the parent plant
2. Exploit new favorable habitat for germination and growth.

Dispersal methods contribute to reproductive success by:

- High chances of seed survival when away from the parent plant.
- Allowing plants to reach specific habitats that are favourable for survival.
- Allowing seeds to avoid adverse environmental effects such as fire or drought.
- Allowing plants to colonize vacant habitats and even new geographic regions.

Reproductive Success in Animals

Some of the reproductive successes in animals are attributed to:

1. Parental Care- is the investment a parent will put into their offspring, which includes protecting and feeding the young, preparing burrows or nests, and providing eggs with yolk. Having fewer offspring allowed parents to invest in parental care which encouraged the survival and possible reproductive success of the offspring.

2. Courtship Behaviour- behaviour by which animals select their partners for reproduction. Mostly, the male initiates the courtship, and the female chooses to either mate or reject, based on his "performance".
Example: display of a male peacock's tail, and elaborate dancing.

3. Pair Bonding- forming a close relationship through courtship and sexual activity leading to production of offspring and/or a lifelong bond. Example: Social and sexual pair-bonding is observed in some human relationships, gibbons, swans, black vultures, wolves, termites and penguins.

4. Territorial Behaviour- when animals actively defend their territory for food, shelter and mate. Territorial behaviour ensures availability of mates and also display of such behaviour by males help attract the females (females are usually attracted towards strong, dominant, powerful males).
Example: When dogs urinate (pee) in their surrounding; they are sending signals to other dogs that it is their territory.

Exercise

1. Explain the importance of reproduction in organism.

2. Choose the most appropriate answer.

- (a) Internal fertilisation occurs
- i. In female body.
 - ii. Outside female body
 - iii. In male body
 - iv. Outside male body

(b) A tadpole develops into an adult frog by the process of

- i. Fertilisation.
- ii. Metamorphosis.
- iii. Embedding
- iv. Budding

(c) The number of nuclei present in a zygote is

- i. None
- ii. One.
- iii. Two
- iv. Four

3. Indicate whether the following statements are True (T) or False (F).

- (a) Oviparous animals give birth to young one. ()
- (b) Each sperm is a single cell. ().
- (c) External fertilisation takes place in frog. ().
- (d) A new human individual develops from a cell called gamete. ().
- (e) Egg laid after fertilisation is made up of a single cell. ().
- (f) Amoeba reproduces by budding. ()
- (g) Fertilisation is necessary even in asexual reproduction. ().
- (h) Binary fission is a method of asexual reproduction. ().
- (i) A zygote is formed as a result of fertilisation. ().
- (j) An embryo is made up of a single cell. ()

4. Define asexual reproduction. Describe two methods of asexual reproduction in animals.

4.

5. In which female reproductive organ does the embryo get embedded?

6. Differentiate between internal fertilisation and external fertilisation.

Essay Writing

Many plants are capable of both sexual and asexual reproduction.

With reference to the statement given above, discuss the following:

- definition of sexual and asexual reproduction;
(2 marks)
- **four** methods of asexual reproduction with examples of local crops that use each method; and
(4 marks)
- **two** advantages of asexual method of reproduction to the Agriculture industry in Fiji.
(2 marks)

5.
