

ACTIVITY NO. - 8: How are new organisms formed without fusion of gametes?

Subject	Science
Class	X
Chapter/Unit	How do organisms reproduce?
Topic	Modes of Asexual Reproduction
Time	40 min
Nature of Activity	Group of 3 students

What will I learn (Learning Outcome)?

Students will explore the methods of asexual reproduction-fission, budding and spore formation.

Skills: Analyzing and Creating

What I have to do? To observe the slides of fission, budding and spore formation and sequentially arrange the steps of these methods.

What do I require? Compound microscopes, permanent slides of binary fission in *Amoeba*, budding in yeast and spore formation in *Rhizopus* (6 each), 36 A4 sized sheets, Reading material

What do I need to know?

Asexual reproduction is a type of reproduction which does not involve the fusion of gametes or change in the number of chromosomes. The offspring that arise by asexual reproduction from a single cell or from a multicellular organism inherit the genes of that parent. There are various modes of asexual reproduction . Fission, budding and spore formation are examples of asexual reproduction methods.

➤ **Teacher's Activity**

Teacher will-

1. explain the process of asexual reproduction.
2. make 12 groups of 3 students each (in a class of 36 students)- Group A,B, C, D, E, F, G,H,I,J,K and L
3. provide slides of fission in *Amoeba*, budding in yeast and spore formation in *Rhizopus* to Groups A,B, C,D , E and F to focus and observe under the microscope.
4. provide reading material to Groups G, H, I, J ,K and L to comprehend the topic.

5. after 10 minutes, teacher will exchange the materials distributed among the first six and next six groups.
6. present the images of reproduction in organisms through PPT
7. distribute A4 sized sheets to all the students, give instructions to discuss and identify the organisms and note down the features in the sheets.

How will I proceed?

➤ Student's Activity

Students will

1. observe the slides and PPT and identify three modes of asexual reproduction and note down their observations.
2. read the material provided to them, discuss and note down the steps and draw diagrams of these methods.

What have I observed?

S.NO		Binary Fission	Budding	Spore formation
1.	Diagram as observed under microscope			
2.	Definition			
3.	Organism(s) in which it occurs			

What have I learnt?

1. In binary fission, after splitting ----- does not exist and two new ----- -- are formed
2. In budding, due to repeated-----at specific sites, bud develops as an outgrowth.
3. Spore formation takes place *Rhizopus* commonly known as -----

What am I curious to learn?

Let us find out-

- How does binary fission take place in a definite orientation in *Leishmania*?

- How does multiple fission in plasmodium take place?

Let me evaluate myself

1. What is asexual reproduction ? What are its various modes?
2. How will an organism be benefitted if it reproduces through spores?
3. Name the type of asexual reproduction in which individuals are formed from a single parent and the parental identity is lost.
4. Fungus, Moss and Fern reproduce by a common method of asexual reproduction. Name the method and also draw a labeled diagram showing the same.
5. Draw labeled diagrams showing the steps of binary fission in *Amoeba* and budding in yeast.

Reading Material

ASEXUAL REPRODUCTION

Asexual reproduction is a process in which new organism is produced from a single parent without the involvement of gametes or sex cells. Many unicellular and multicellular organisms reproduce asexually. In this process, parent organism either splits or a part of parent organism separates to form a new organism. In this reproduction, certain cells of the parent undergo mitotic cell division so that two or more new organisms are formed.

There are six types of asexual reproduction. They are:

- 1) Fission
- 2) Budding
- 3) Spore formation
- 4) Regeneration
- 5) Fragmentation
- 6) Vegetative propagation

We are going to study about the first three types today.

Fission

In fission, unicellular organism splits to form new organisms. It is a process of reproduction in organisms such as protozoa and many bacteria.

Binary Fission

In binary fission, the parent cell divides into two after reaching a point where it has fully grown. In this process, after splitting parent cell do not exist and two new organisms are formed.

Examples of unicellular organisms that undergo binary fission are amoeba, paramecium, Leishmania etc.

Budding

The word bud means small outgrowth. In the process of budding, a small bud grows on the body of parent organism and when the time comes it detaches itself to form a new organism. Hydra and yeast undergoes the process of budding.

Spore formation

The method of spore formation occurs in both unicellular and multi-cellular organisms. This process takes place in plants. In spore formation, the parent plant produces hundreds of reproductive units called spores in its spore sac called sporangium. When this sporangium of the plant bursts, these spores travel in air and land on food or soil. Here they germinate and produce new plants.

Fungi like Rhizopus, Mucor, etc., are examples of spore formation.