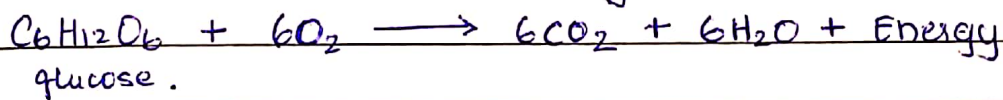


• Experiment Name: CO_2 is released during respiration in plants

• Aim: To show experimentally that carbon dioxide is given out during respiration in plants.

• Theory:

- All living things show respiration
- It is an advanced process that occurs inside the cell, hence it is called cellular respiration.
- It involves the breaking down of food to release energy and carbon dioxide.
- Its reaction is the reverse of photosynthesis.



- The energy released in cellular respiration is used to synthesise a molecule called ATP.
- Plants also release CO_2 during respiration.
- The exchange of gases during respiration takes place through small pores on the leaf called stomata.

In Animals: - There are two types of respiration in animals: Aerobic and anaerobic respiration.

- Aerobic respiration needs oxygen and anaerobic respiration occurs in the absence of oxygen.
- Carbon dioxide can be tested by lime water.
- These are three pathways of respiration as shown:

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Materials Required:

1. A conical flask
2. Small test tube
3. Cork
4. Thread.
5. Germinating seeds.
6. A bent tube.
7. A beaker.
8. water
9. Freshly prepared lime water

Procedure:

1. Take two conical flasks, add germinating seeds with little water sprinkled over it.
2. Fix the mouth of conical flasks with cork in which a bent tube is fixed.
3. Suspend a small test tube containing KOH solution in it with the help of a thread in conical flask A.
4. Allow mouth of the bent tube to be immersed in water in set-up A and in lime water in set up B as shown below
5. Record your observations after few hours.

Observations:

1. In set-up A, the water level in the bent tube dipped in beaker increases after few hours. This is because the oxygen present in the conical flask is taken up by the germinating seeds and CO_2 released due to respiration is absorbed by KOH present in the small tube. Hence, the air pressure in the flask reduces and water level rises.

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2. In set-up B, the freshly prepared lime water turns milky. This is due to excess CO_2 released into the test tube during respiration of germinating seeds.

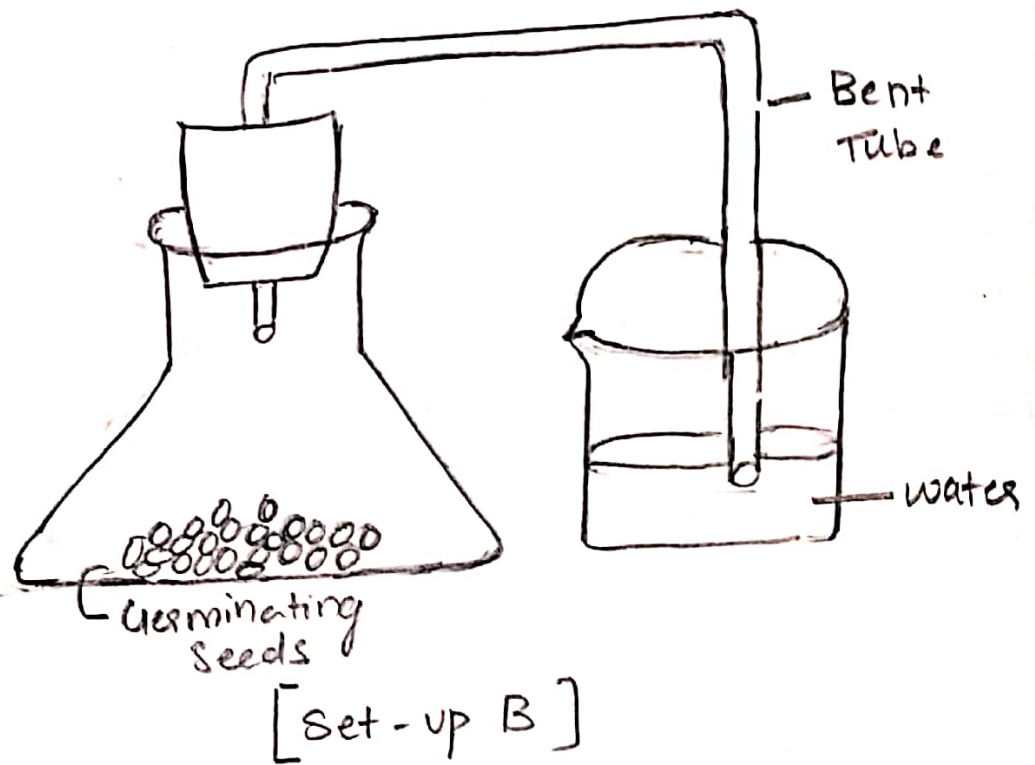
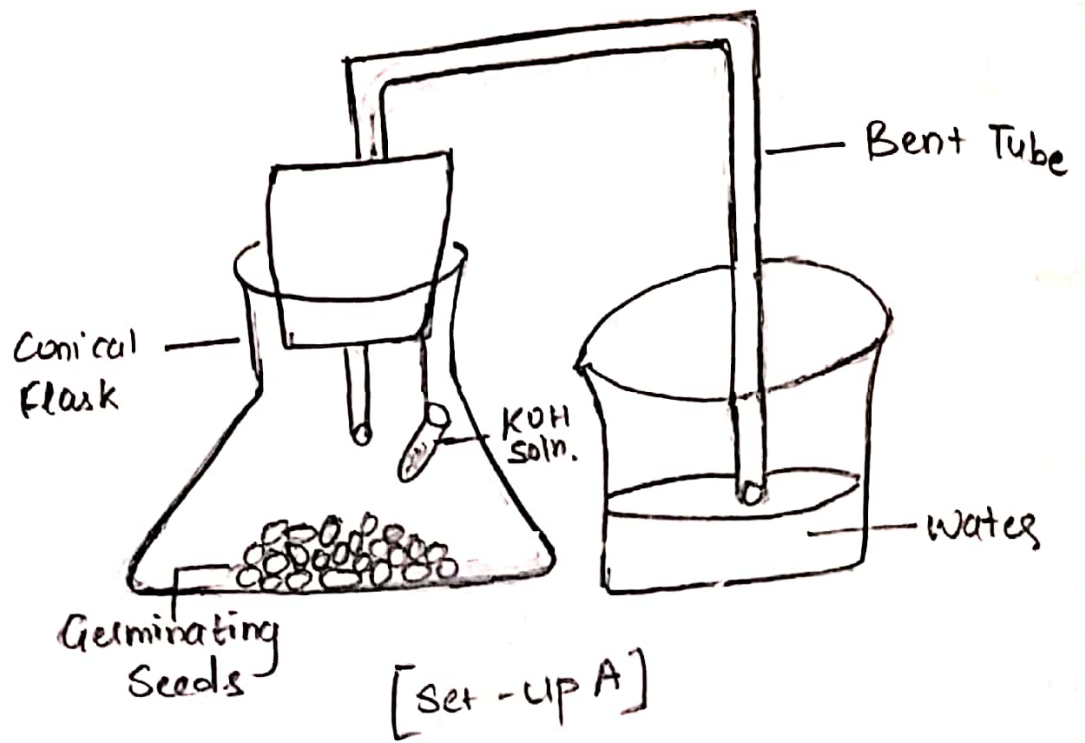
c. Conclusion:

. This shows that CO_2 is given out during respiration.

c. Precautions:

1. Lime water should be freshly prepared.
2. KOH solution should be freshly prepared.
3. Germinating seeds should have a lot of moisture in them.

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c Experiment Name: Binary Fission in Amoeba and Budding in Yeast.

c Aim: To study binary fission in amoeba and budding in yeast with the help of prepared slides.

c Theory:

- Reproduction: Plants and animals reproduce either by asexual or sexual method

- Asexual Method: When an organism reproduces by single organism, it is called asexual reproduction. The different ways of asexual reproduction are fission, budding and regeneration in animals.

1. Binary Fission:

- This commonly seen in single celled animals. There are no gametes or fertilization. The cells divide many times through mitosis. Animals like Amoeba reproduce in this manner.

- Karyokinesis, that is division of the nucleus, takes place first and then, followed by cytokinesis, that is division of the cytoplasm.

2. Budding:

- In this type of reproduction, an outgrowth develops due to repeated cell division on the parent cell that grows to form a bud. The fully grown bud detaches from the mother's body and becomes a new individual.

- Yeast are unicellular eukaryotic micro-organisms belonging to the kingdom fungi. (some are multicellular)

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• Materials Required:

1. Prepared slides of Amoeba showing binary fission with different stages.
2. Prepared slides of yeast showing budding with different stages.
3. Compound microscope. 2-4.

• (A) Binary Fission in Amoeba:

• Procedure

1. Place the prepared slides of Amoeba showing different stages of reproduction on the stage of the microscope.
2. Adjust the mirror of the microscope to focus maximum light on the slide. Adjust the eye-piece of the microscope so that the slide is clearly focused and seen.
3. Draw diagrams of the stages of binary fission in Amoeba.

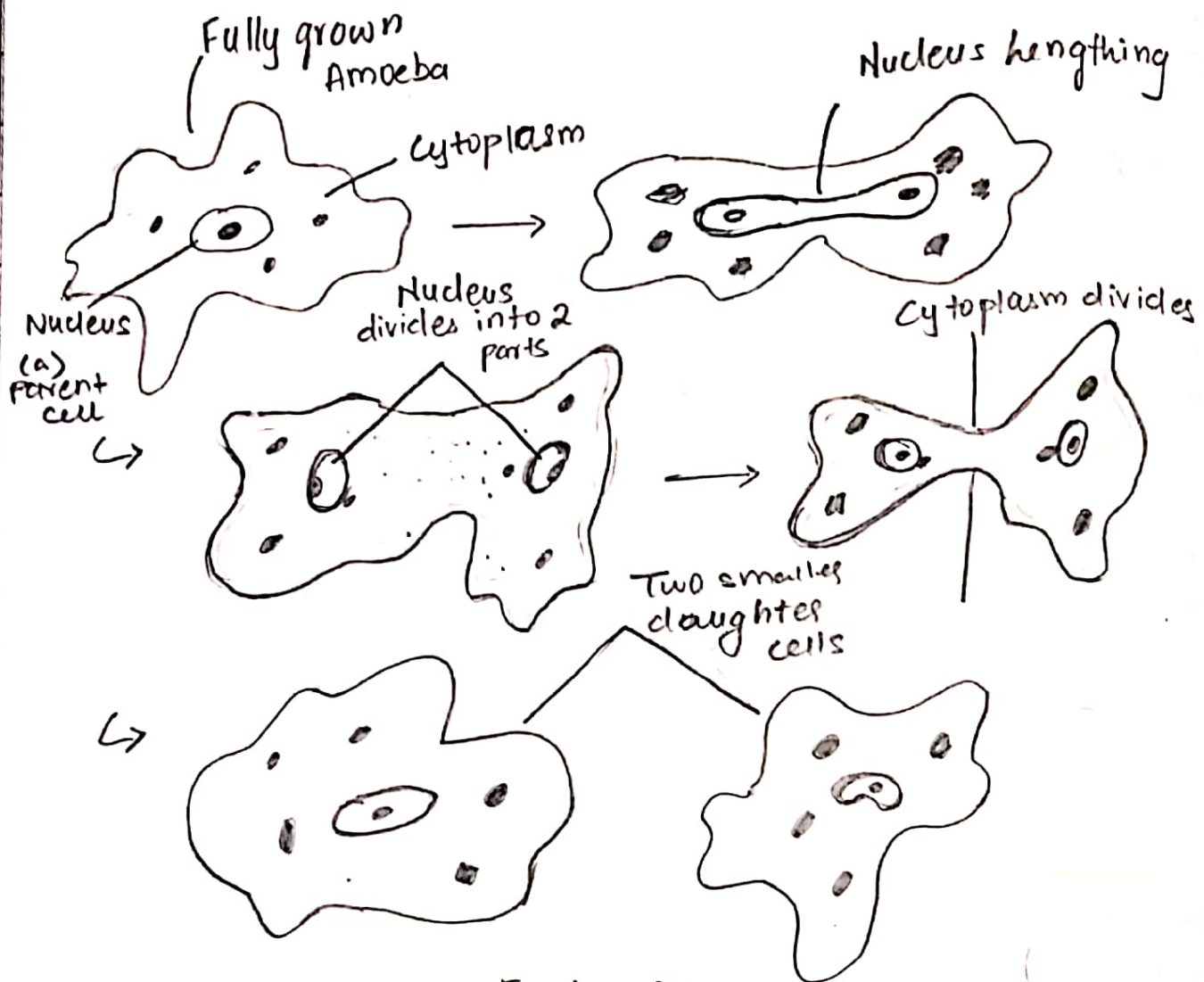
• Observations:

1. Amoeba is a protozoa that lives in water and has irregular shape.
2. In the center of Amoeba, a dense nucleus is seen.
3. In the second stage, Amoeba shows nucleus division, i.e. karyokinesis.
4. In the third stage, we can see the cell body division, i.e. cytokinesis.
5. In the fourth stage, two daughter cells of Amoeba are found.

• Conclusion:

- The given slides showed the division of a single cell body into two equal halves. The division of nucleus and cell body are seen which led to the formation of two daughter cells. Hence, this kind of reproduction seen in Amoeba is binary fission.

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Binary Fission in Amoeba.

(B) Budding in yeastProcedure:

1. Place the permanent/prepared slides of yeast showing different stages of reproduction on the stage of microscope.
2. Make the adjustments in mirror of the microscope for focussing maximum light on the slide.
3. Adjust the eye-piece so that the slide is clearly seen.
4. Draw diagrams of the stages of budding yeast cells.

Observations:

1. Yeast is oval or spherical in shape.
2. It is a unicellular organism.
3. In the second stage, yeast shows a small growth on it called 'bud'.
4. In the third stage, yeast shows that in some situations many such chain of buds is seen on the parent cell. This process is called 'budding'.
5. On maturity, the buds gets separated from parent cell to form and grows as a new organism. This process is called budding.

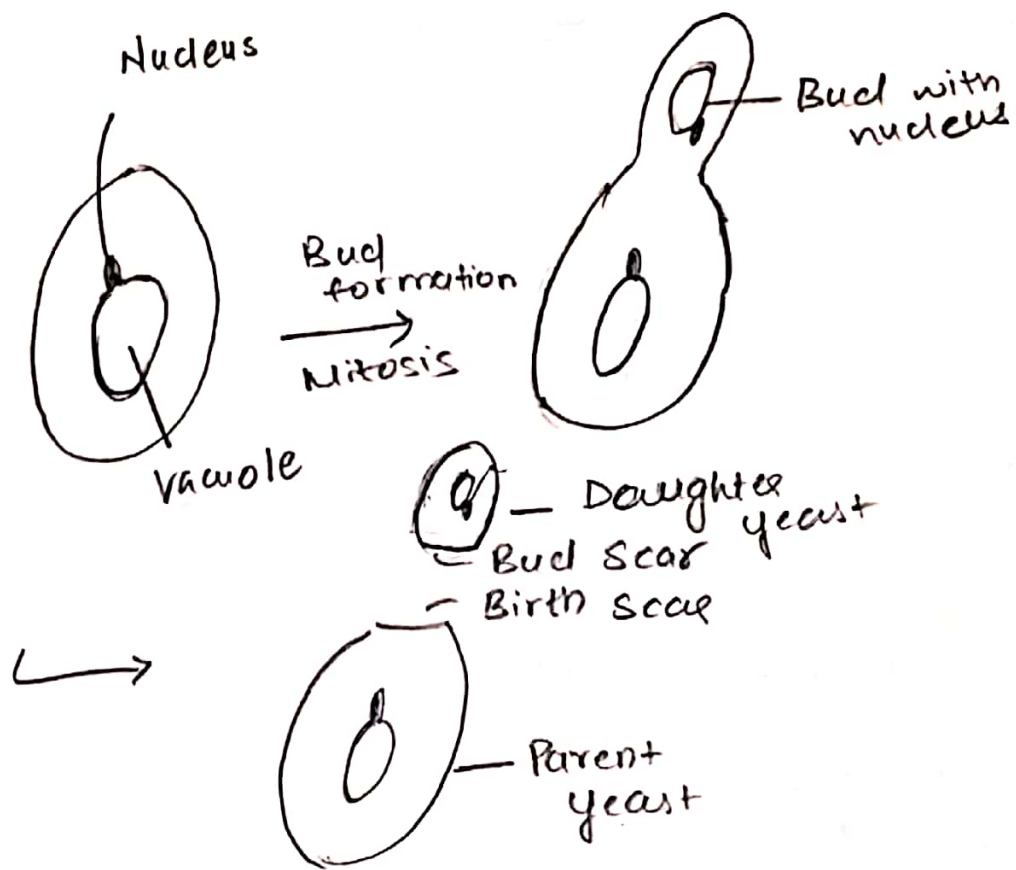
Conclusion:

- The given slides showed the small growth (bud) on yeast. These buds on maturity separates from parent cell and grow as a new organism, hence, yeast shows budding.

Precautions:

1. Use microscope very carefully. Do not disturb its adjustments.
2. The slides shown under the microscope should not be disturbed.
3. Set the mirror of the microscope for better focus on light on the slide.

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Budding in Yeast.

Expt. No. _____

4. The slide can be seen under low power or high power of the microscope. These adjustments should be done very carefully.

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