

Biology Grade 7

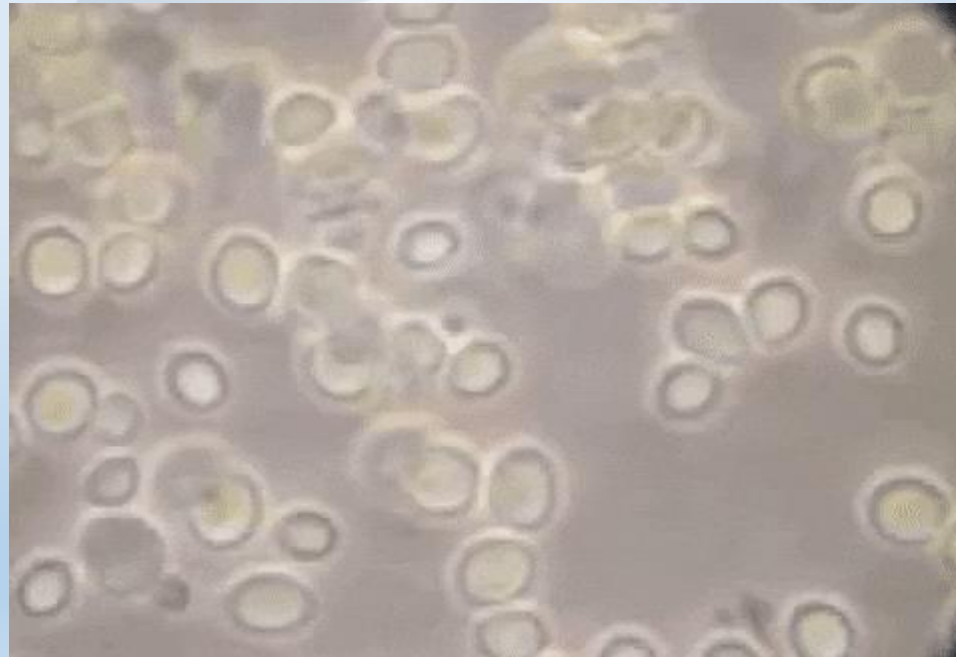
CHAPTER 3: RESPIRATION OF LIVING BEINGS

Activity 3: life in absence of oxygen

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Activity 3: Life in the absence of oxygen

- Micro-organisms, like yeast, responsible for fermentation, are capable of living in a medium deprived of oxygen and liberate carbon dioxide.
- How do these micro-organisms live?



❖ Verification of Alcoholic Fermentation

Another kind of fungi (microorganisms) is yeasts. Scientists wondered about how the yeast is supplied with energy and what conditions are needed for yeasts to grow. For this reason, they conducted these experiments.

1. Pick out the posed problem.

How the yeast is supplied with energy and what conditions are needed for yeasts to grow?

2. Specify the nature of the gas bubble produced.

CO₂, since the lime water has changed from clear to turbid.

3. Pick out the other product.

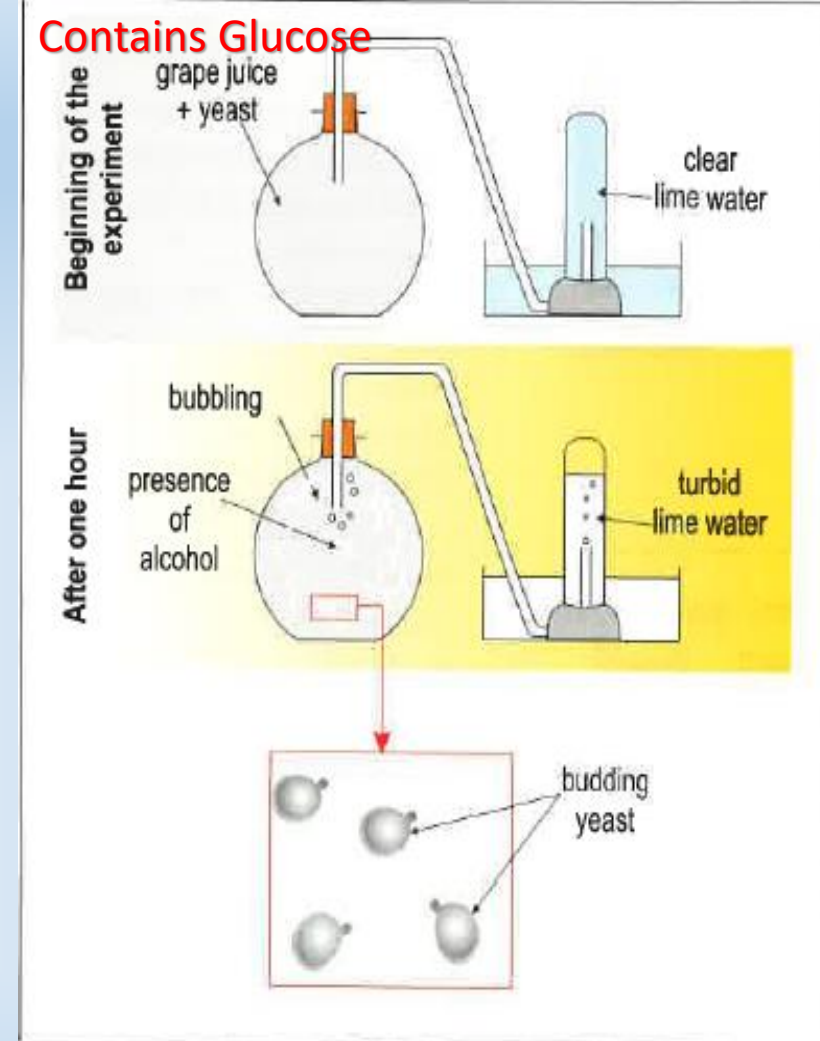
Alcohol

4. Using the experiment, write the chemical equation of the alcoholic fermentation.

Glucose + yeast → alcohol + carbon dioxide

5. Does this reaction need oxygen?

No



Fermentation is a process in which the yeast breaks down glucose sugar into alcohol and carbon dioxide in absence of oxygen to obtain energy.

Further experiments were done in searching for the conditions of fermentation. For this reason, 5 experiments made at a temperature of 25°C in media deprived of oxygen for experiments 1, 2, 3 and 4.

Note that the must of grapes contain wild yeasts.

Number of the experiment	Content of the flask	Result (+): fermentation (-): no fermentation
1	must of grapes	+
2	must of grapes boiled and cooled	-
3	must of grapes boiled and cooled + yeast	+
4	water + yeast	-
5	must of grapes	-

1. Indicate the role of flask 1.

it is the control flask.

2. Justify why fermentation didn't take place in flask 2.

Since yeasts grow naturally in the must of grapes, the high boiling temperature will kill them. Even after cooling, the yeast will no longer be present. Therefore, fermentation will not happen.

Number of the experiment	Content of the flask	Result (+): fermentation (-): no fermentation
1	must of grapes	+
2	must of grapes boiled and cooled	-
3	must of grapes boiled and cooled + yeast	+
4	water + yeast	-
5	must of grapes	-

5. Draw on the conditions of fermentation.

The conditions of fermentation are the presence of sugar (found in must of a grapes), presence of yeast and the absence of oxygen.

3. Justify why fermentation didn't take place in flask 5.

fermentation didn't take place in flask 5 due to the presence of oxygen.

4. Analyze the results of the experiment.

Fermentation takes place in flask 1 containing must of a grapes and in flask 3 containing must of grapes boiled and cooled with yeast, placed at 25 °C in the absence of oxygen. While fermentation doesn't take place in flask 2 containing must of a grapes boiled and cooled, nor in flask 4 containing water and yeast and placed in the same conditions. Moreover, fermentation doesn't take place in flask 5 containing must of grapes and placed at 25 °C in the presence of oxygen.