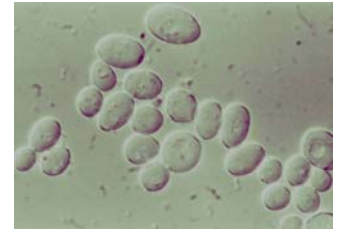


Is Yeast Alive?

OBJECTIVES

1. To determine if yeast are alive by determining if they have the ability to metabolise (use energy).



BACKGROUND INFORMATION

Yeast belong to the fungi kingdom - fungi cannot make their own food, possess little movement and are composed of one or many cells. They can lie dormant – only basic cell functioning - for long periods due to their strong cell walls which allow very little to pass into and out of the cells. Once yeast come into contact with water, they start breaking down stored sugars to get the energy they need and give off a gas called carbon dioxide as a by-product of this reaction. If more sugar is available to the yeast, they will continue to break it down for the energy and continue to release carbon dioxide. Yeast can also use enzymes to break down complex carbohydrates such as starch (found in flour for bread making) into sugars, ready for it to be used as an energy source.

We will test whether the yeast can metabolise sugar and produce a gas which we will presume is carbon dioxide.

WHAT YOU WILL NEED

- 4 conical flasks or small plastic bottles
- 4 balloons
- 1 funnel
- Masking tape
- Labeling pen
- 4 x $\frac{1}{2}$ tspn dry yeast
- 2 x $\frac{1}{4}$ cup sugar
- 2 x $\frac{1}{2}$ cup warm water
- $\frac{1}{2}$ tspn measure
- $\frac{1}{4}$ cup measure
- $\frac{1}{2}$ cup measure

WHAT TO DO

1. Label the bottles with letters A to D.
2. Place the funnel in the mouth of each bottle and add the following ingredients:
 - A. Yeast
 - B. Yeast + water
 - C. Yeast + sugar
 - D. Yeast + sugar + water
3. Cover the opening of the flasks with balloons to catch any gas that is formed.
4. Swirl each flask to thoroughly mix the contents.
5. Place the flasks in the sun.
6. Record the results every 10 minutes for one hour.

RECORDING RESULTS

	0 min	10 min	20 min	30 min	40 min	50 min	60 min
A							
B							
C							
D							

QUESTIONS

1. Under which conditions was the most gas produced?
2. What is the effect of adding water to the yeast?
3. What is the effect of adding water and sugar to the yeast?
4. When you make bread, if you just mix flour, sugar and water, the dough does not rise, and the bread will be flat and hard. If you include yeast in the bread dough, then the dough rises and the bread is bigger and fluffier. Can you explain how the yeast helps the bread dough to rise?
5. Based on your findings, do you think the little brown grains of yeast are alive? Explain why or why not.

CURRICULUM

Essential Learnings Year 5:

Living things can be grouped according to their observable characteristics.

Essential Learnings Year 7:

Cells are the basic unit of all living things and perform functions that are needed to sustain and reproduce life.

REFERENCES

1. *Primary Connections, Marvellous Micro-organisms, Stage 3, Life and living*. 2005. Canberra: Australian Academy of Science.
2. Waldron, I. & Doherty, J. 2008. Hands-on Activities for Teaching Biology to High School or Middle School Students. http://serendip.brynmawr.edu/sci_edu/waldron/ (Accessed 27 March, 2008).