

FERMENTATION IN A BAG – How can we make fuel from plants?

Most living things need oxygen to survive. We breathe in oxygen because our bodies use it to break down our food for energy. But some organisms can get energy from their food without oxygen. Yeast is one of those organisms. Yeast is a tiny, one-celled fungus that we add to bread to make it rise. We also use yeast to make alcoholic drinks like beer and wine. In this activity we will investigate the process of fermentation: how yeast eats a food source when no oxygen is available. Investigating fermentation will also reveal secrets for how we can turn plants into fuel.

You will combine yeast, water, and a food source in a sealed zipper bag. Then you will observe and measure the products of fermentation as directed by your teacher.

Experimental procedure:

1. Choose a sugar, starch or cellulose source for your yeast from the options provided.
2. In the resealable bag, combine 1 teaspoon of your food source and 1 teaspoon of yeast.
3. Add 50mL (1/4 cup) of warm tap water and seal bag closed, removing as much air as possible.
4. Mix gently. Lay bag on a flat surface and watch for changes.
5. Take measurements and make observations as instructed by your teacher for 10-30 minutes.

Before the experiment:

1. What food source will you give to your yeast? _____
2. What changes, if any, do you expect to observe with your bag over time?

Explain.

3. Do you expect to see any differences in observations between food sources that your class is comparing?

Explain.

During the experiment: Record your observations and measurements.

Yeast food source: _____

Start time: _____ End time: _____ Total time (min): _____

Observations & Measurements:	Before	After
Record scientific observations & measurements (changes in appearance, smell, etc)		

After the experiment: Analyze and interpret your results.

1. Summarize what you know about substances in the bag before and after the experiment using this table:

Questions	Start of experiment	After experiment
What's in the bag?		
What evidence do you have?		

2. Propose an explanation for the changes you observed.
3. Compare your results with the class. What differences did you observe between food sources made of sugar, starch or cellulose?
4. Propose an explanation for those differences.