

Grass to Gass – A Fermentation Experiment

Green & Healthy School Virtual Learning Sustainability Series



Materials List

- Dry active yeast (You can find this in the baking aisle. You'll need one tsp for each feedstock in your experiment.)
- Warm water
- 1 tsp measuring spoons
- Something to measure $\frac{1}{4}$ cup or 50 ml of water
- Feedstock(s): sugar, cornmeal, sawdust, dried leaves or grass, ground cereal (1 tsp of each. Be creative!)
- Resealable zipper bags ("snack" size) – one for each feedstock you'll test.
- Paper towels (in case of mess)
- Optional: Ruler, measuring tape or breathalyzer to measure results

Guiding Questions:

How can we make fuels from plants?

Which feedstock will the yeast ferment the "best" and why?

What chemical changes occur during fermentation?

What challenges do certain feedstocks pose for biofuels researchers?

Procedure:

1. Make a prediction: which feedstock will the yeast "like" best? How will we know?
2. In a snack-size resealable zipper bag, combine 1 teaspoon of sugar (or another feedstock) and 1 teaspoon of yeast.
3. Add 50 mL (1/4 cup) of warm tap water (approx. 40° C) and seal bag closed, removing as much air as possible.
4. Mix gently.
5. Repeat for each one of your feedstocks. (1 teaspoon yeast, one teaspoon feedstock, and $\frac{1}{4}$ cup water in each bag.) Be sure to label bags for their contents.
6. Lay bag on a flat surface, watch for results, and make observations – the fastest results should be achieved in 15 minutes.**
7. Optional: Measure and compare ethanol and/or CO₂ production using rulers, measuring tape, or a breathalyzer if you have one. Discuss and interpret results.

***Warning: As the yeast produce carbon dioxide, the bag will expand – it may even pop! Be sure to monitor the bag and release the gas if it becomes too inflated.*