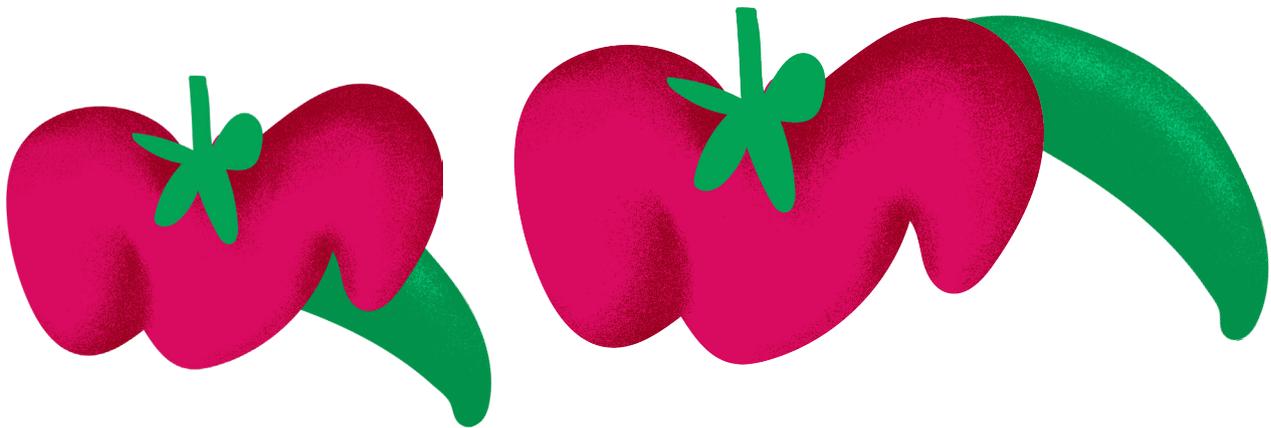


Gut Gasses

Year 5 – Science



(Science; Yr 5, ACSSU077)

Solids, liquids and gasses have different observable properties and behave in different ways

Gut Gasses

Or... why we fart

Billy has a problem... it's not his own digestion, it's his fart-machine little sister!

How does gut gas happen and what can we do about it?

Equipment:

(If you choose to do the hands-on activity)

Vessels for demonstrating 30 litres (L) such as 3 x 10L watering cans; and for showing 200 millilitres (ml), such as metric measuring cups

Clean, empty see-through drinking bottles, party balloons: one per group

Water

Sugar

Dry yeast

Measuring spoons and cups

Duration:

30-40 minutes

Location:

The classroom

Notes:

Getting started

👁 Watch **The One with All the Farts**



- ❓ Ask the class what makes people fart.
- Explore the facts in the box below – gut gas is perfectly natural and actually part of a healthy digestive system.
- If readily available, you could show students what 30 litres looks like (e.g. 3 x 10L watering cans) and what 200ml looks like (e.g. not even one measuring cup full).

Food and Farts

- Some foods make you fart more than others.
- The secret is the carbohydrates (complex starches) in the foods.
- We all have millions of bacteria in our intestines. These bacteria help us, by breaking down our food. When they break up the food, a by-product is a gas they produce.
- Some foods make the bacteria go into overdrive and the gas production can be extreme!
- These foods include: beans, mushrooms, broccoli, cabbage, lentils, peas, Jerusalem artichokes, raw onions and raisins.
- Processed foods often contain fructose and lactose, a combination that can lead to increased gas.

More Farty Factasticals:

- ◇ Better Health – Flatulence:
<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/flatulence>



Hands On Gut Gas

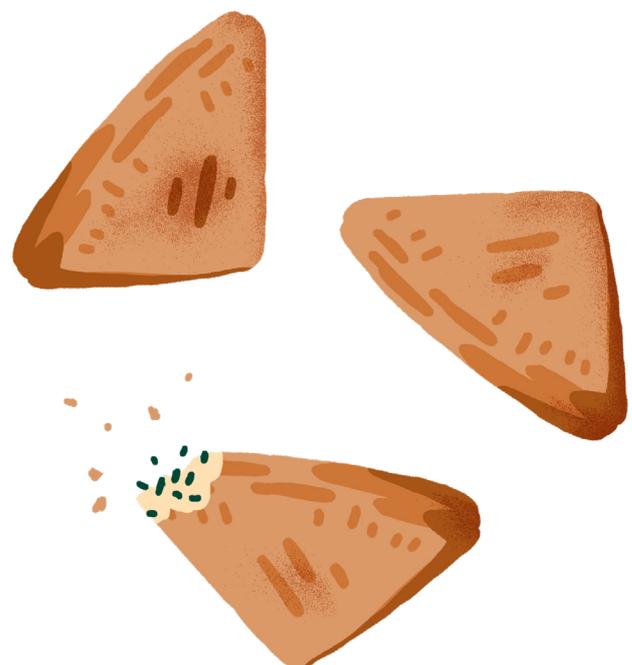
- This activity demonstrates how a living thing (such as the bacteria in our intestines) produces gas. (The yeast in the demonstration is not the same as the bacteria in our intestines, but it produces gas in a similar way when it is given food and water.)
- In small groups, have students place 1 tsp sugar, 1 tsp instant dry yeast and 60ml water through a funnel into a bottle.
- They swirl the bottle (gently) to mix.
- Students place a party balloon over the neck of the bottle and set their bottles aside.
- Over the course of an hour or so, the balloon should stand up (it won't inflate, just stand up).
- ❓ Discuss what happened (gasses were produced, increasing the pressure inside the bottle).
- Explore students' understanding of the source of the gasses (the living creatures – yeast – metabolising and reproducing, means that they also produce waste, which in this case is a small amount of water, alcohol and carbon dioxide gas.)

Resources:

- ◇ Healthline – Flatulence: <https://www.healthline.com/symptom/flatulence>
- ◇ University of Bergen – Why do we fart? <http://www.uib.no/en/news/95058/why-do-we-fart>

Puffed Up Pastry

- If time permits and you have cooking facilities, try making a dish that relies on gasses to puff it up. Examples include: puff pastry (steam puffs it up), bread (yeast releases carbon dioxide just like in our experiment, and it is captured by the stretchy flour dough).
- On the next page is a recipe for baked turnovers. As an entrée to your lesson on gasses, prepare the caramelised onion mix before class (it's best if the mix has completely cooled), and give students a square to stuff, fold and brush with egg-wash. While their turnovers bake, watch **The One Where We Smell Pee for Science** to learn more about stinky sulphur. You could also bring in pre-baked vol au vents for students to fill with caramelised onion mix instead (or substitute with your favourite vegetable filling).



Thyme for Caramelised Onion Turnovers

From Alice: I've always thought that these were called "turnovers" because of how little time it takes to turn them over from fresh ingredients to flaky, puffy parcels of joy! It's pretty easy to transform these from slippery onion to golden pumpkin or even curried potato (hello, samosas!) by switching around the filling ingredients. The only constant is your magical puff pastry, using the glory of gas for good eatin'!



Lexicon

Caramelised looks a lot like "caramel", right? That's because it refers to the process of cooking sugar in all its forms – something that plenty of vegetables (like onions) are full of! Just like caramel, caramelising vegetables brings out their natural sweetness.

Translucent practically every savoury recipe starts with the cooking of some form of onion. If a recipe calls for you to caramelize your onion, you let it turn brown slowly (not too fast or it'll burn). If a recipe wants 'translucent' onion, it's asking you to sweat the onion until it turns clear. In this recipe's case, you're sweating and then caramelising, which adds to the magical flavour at the end.



Stuff

Chopping board and **knife** and **frying pan** and **wooden spoon** and **pastry brush** and **baking tray** and probably **serving plates**

What

4 tablespoons of olive oil

8 brown onions, sliced finely (and carefully)

50 grams (g) brown sugar

40 milliliters (ml) red wine vinegar

Sea salt and cracked black pepper

16 kalamata olives, pitted and cut or torn in half

100g of goats cheese, crumbled

4 sprigs of thyme (leaves removed)

8 sheets of frozen puff pastry, each cut into four

1 egg, beaten

How

- Pre-heat oven to 210°C.
- **GROWN UP EYEBALLS!** Heat the oil in a large frying pan over a medium heat. Add the onions and cook for 20 minutes or until they turn translucent and soften. If the onions look to be turning brown, add a tablespoon of water and turn the heat right down (you want this to take a while to help bring out all the flavours in the onion).
- Add the brown sugar, red wine vinegar, salt and pepper and continue cooking for another five minutes. Remove from the heat and allow to cool (this step can be done way ahead of time).
- Place pastry squares on the baking tray lined with baking paper.
- Place two heaped tablespoon of the caramelised onions over the pastry, leaving a 1 centimeter (cm) border. Top with an olive half and a sprinkle of goat's cheese (if using) and thyme leaves. Then brush the edges with a little beaten egg and fold into a triangle, pinching together the edges. Brush the top with a little more beaten egg for a shiny golden finish.
- Bake for 15 minutes until the pastry is crisp, golden and puffed.

Top Tips

- If you're pressed for time, you can make up the onion mix well in advance, ready to be stuffed and baked. Folded, unbaked onion puffs can also be frozen and then baked as you go.
- There are some seriously scrumptious, punchy flavours in this turnover, that I know you're going to love. But the best part about MYO is that once you've followed the recipe's version, you can adapt it to suit your tastes! You can add more olives, swap the goat's cheese for mozzarella or cheddar, sprinkle thyme on the outside for interest – or even get rid of the optional extras and go only onion for a change!