SCIENCE

GAS FROM GARBAGE

Worksheet

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Exercise 1 — Grammar, Speaking, Writing

Complete the sentences making predictions about what you think will happen.

The bag of beans put in the .... will ....
I think the all the bags will ....
The bag put in the ... should ...
The bag put in .... might ...
I don't think the bag put in the ... will ...

Exercise 2 — Grammar, Speaking, Writing

Complete the following with the results of the experiments

Bag	Location	Prediction	Result
1			
2			
3			
4			
5			

Were you surprised by any of the results?

Exercise 3 — Speaking

Work in groups and discuss these questions.

1. What did you think would happen to the different bags?
2. What did your base your predictions on?
3. Were you surprised by any of the results?
4. If you did the experiment do you think the results would be the same? Why (not)?
5. What other types of rubbish could we make gas from?
6. Could this type of gas be useful in any way? How? Why (not)?

science museum

Exercise 4 — Grammar, Writing

a) Look back at the results of your experiment and complete these sentences.

1. The biggest bag was the one kept in ....
2. The bag kept in ... had less gas than the one kept in ....
3. The smallest bag was the one kept in ...
4. The bag kept in ... was bigger than the one kept in ...
5. There was more gas in the bag kept in ... than the one kept in ...

b) Now write four sentences of your own using comparative or superlative adjectives.

1.
2.
3.
4.

Exercise 5 — A Scientific Report: Writing

Useful language for writing a scientific report

Say what you did
We took fifty kidney beans and ...
In each bag we put ... kidney beans and then ....
We put one bag in ... and the next one ...
After 24 hour we ...
Say what you predicted would happen
I thought that the ... would ...
Say what happened
In fact, the bag that was in ... had the most / least gas in it.

Say why you think it happened

I was surprised that ...

I think that the bag in ... had the most / least gas in it because ...

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Learning objectives

Pupils learn how biomass can produce gas, especially when stored in warm, damp conditions. They then speculate how such gasses could be used.

Content summary

Pupils conduct a simple experiment to see how different conditions can have varying results in terms of how biomass reacts to each specific condition.

Skills

Reading, speaking, writing

Grammar

Modals of prediction and deduction: *will, should, might, could*.
Comparative and superlative adjectives: *more, most, less, least, bigger, biggest* etc.

Vocabulary

Verbs: *pour, soak, moisten, hold, occur*
Nouns: *a stack, bowl, paper strip, coin, fingertip, electric shock, vinegar, metal.*

Time needed

Total of 48+ hours. Beans need to be soaked for 24 hours and after the bags have been placed in different locations they need to be left there for 24 hours.
45–90 minutes

Age group

7–11

Materials needed

- 5 re-sealable plastic bags per group.
- 50 kidney beans per group.

Practicalities

You will need to soak the kidney beans for 24 hours prior to the first class and you'll need a follow up lesson the day after you have started the experiment.

Procedure

- Tell pupils they are going to conduct an experiment using kidney beans and plastic bags.
- Ask the pupils what they think the experiment could be about. Give the pupils a guesses and see if anyone is close/correct.
- Introduce/pre-teach the following vocabulary that pupils will need to understand: *resealing, squeezing, examine, measure, extent, inflated, bulge*
- Put pupils in groups and give each group 5 re-sealable plastic bags and 50 of the pre-soaked kidney beans.
- Hand out the experiment or put it up on your interactive whiteboard projector sheet and have pupils read out the instructions in class.
- Next, hand out the worksheets to the groups and ask each group to discuss and complete exercise 1.
- The next day. Ask the groups to reform and to collect their plastic bags full of kidney beans.
- Ask the pupils to complete exercise 2–5 together.
- Monitor and help where necessary.

Note: exercise 5 can be done individually for homework if time is short.

Links to everyday life

You could ask the pupils to think of all the everyday items they use gas for i.e. heating, cooking, powering cars/vehicles (potentially) etc.

When you do the analysis/discussion section or exercise 3 you could link this into the everyday uses.

Key information

- Biomass was the first fuel that humans discovered - when they used wood to make fires.
- Biomass is basically anything that was once alive, including trees, plants, animal poo and food waste.
- Methane gas can be produced from composting vegetable matter and food wastes.

Gas from Garbage

- All answers will depend on what happens during the experiment, or on the ideas/predictions that the pupils make.

- In theory, the bag of beans placed in the warmest location should produce the most gas.