

# Miss MOLECULE & friends (episode 2) / METHANE



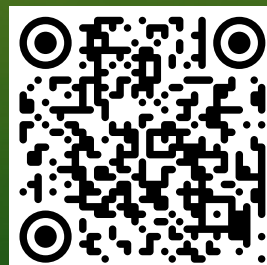
## Key Stage 2 & 3 workbook

Methane is a potent greenhouse gas that traps heat in our atmosphere. Due to human activities like farming and industry, its levels are currently at a record high. Fortunately, solutions are emerging, such as converting cow manure into clean energy and using satellites to detect methane leaks worldwide.

Episode 2 link: [www.missmolecule.co.uk/episode2](http://www.missmolecule.co.uk/episode2)



Scan or click the QR code to watch the episode:



Miss  
**MOLECULE**  
& friends

A Studio Wallop production

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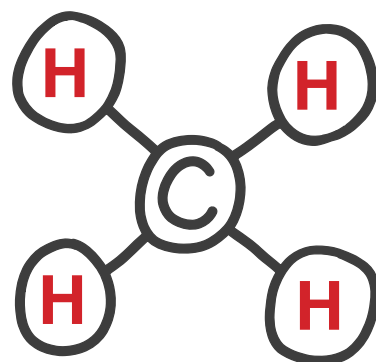
This Miss Molecule & Friends episode is all about the gas Methane. After watching the animation, can you remember some facts about this gas and why scientists are working to reduce its amount in our atmosphere?

What is true or false about methane?

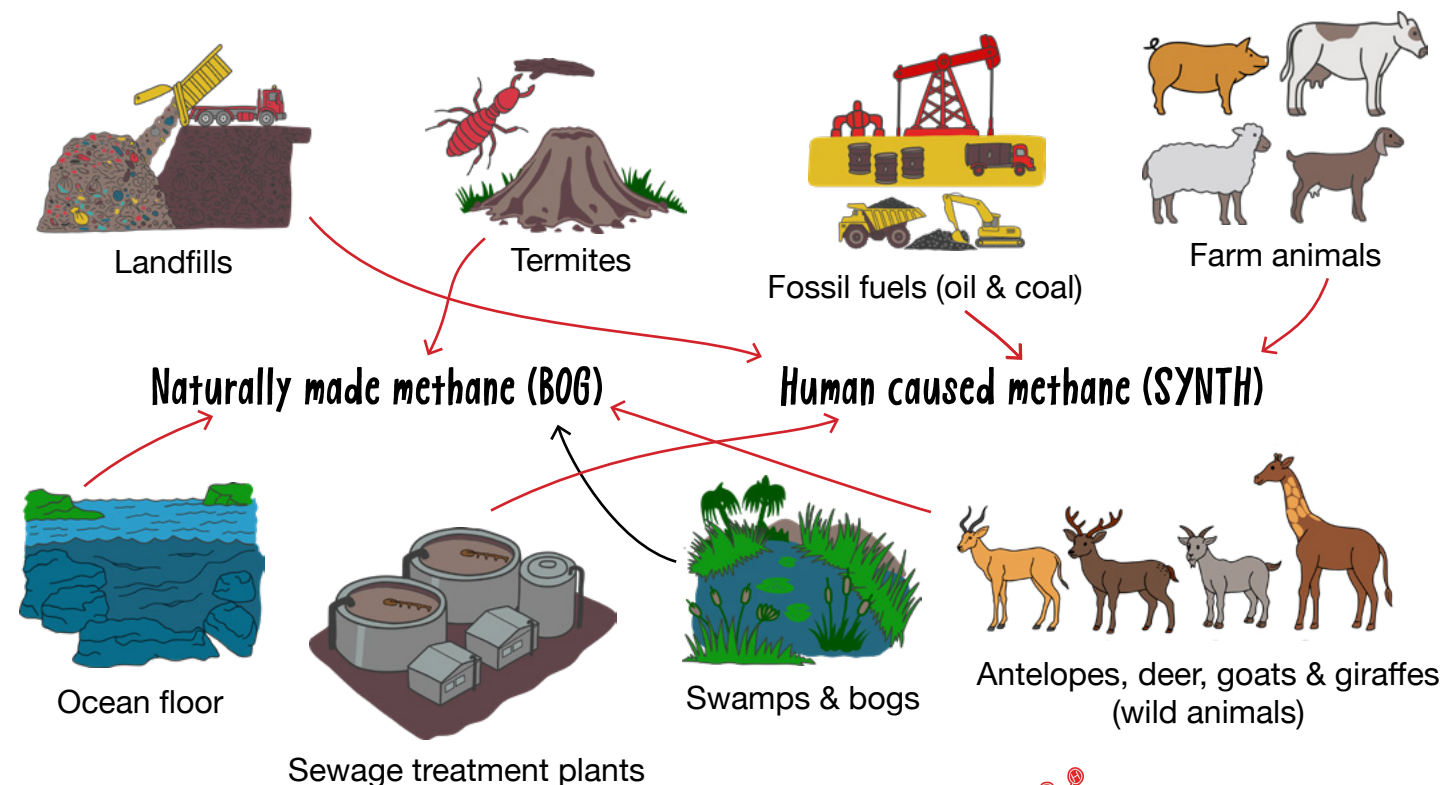
	True	False
Odourless (doesn't smell)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It's solid	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flammable (easy to catch on fire)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Very smelly	<input type="checkbox"/>	<input checked="" type="checkbox"/>
It is always being made	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lighter than air	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Heavy	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Methane is made up of 1 carbon atom and 4 **Hydrogen** atoms.

Draw them into the image below.

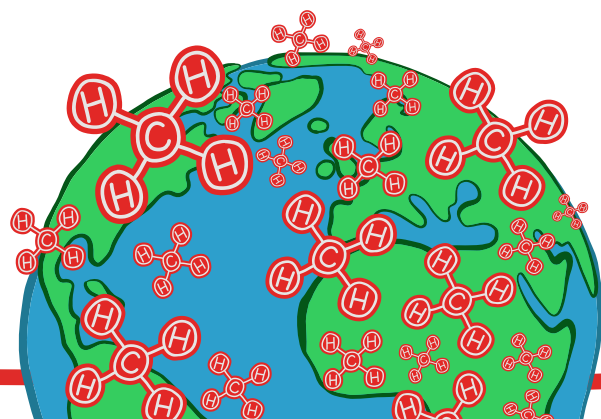


Can you match the types of methane emissions to their sources?



Is methane stronger or weaker than carbon dioxide when heating up the planet?

☒ Stronger ☐ Weaker



Methane is produced in two ways: from natural sources and human activity. Which character represents which source? Can you remember some of the things about them?



Name:

**Bog**

What source of methane am I?

**Natural**

What makes me?

**Bogs, swamps, wild grazing animals (deer, antelope, giraffes), termites, ocean floor.**

Methane is the main ingredient in natural gas used in homes, but what do we use gas for?

**Cooking/heating**

Methane is an odourless gas, which means it has no natural smell. So why do we add a stink to it?

**To help us find leaks**

What happens to our atmosphere if too much methane is in the air?

**Warms up**



Name:

**Synth**

What source of methane am I?

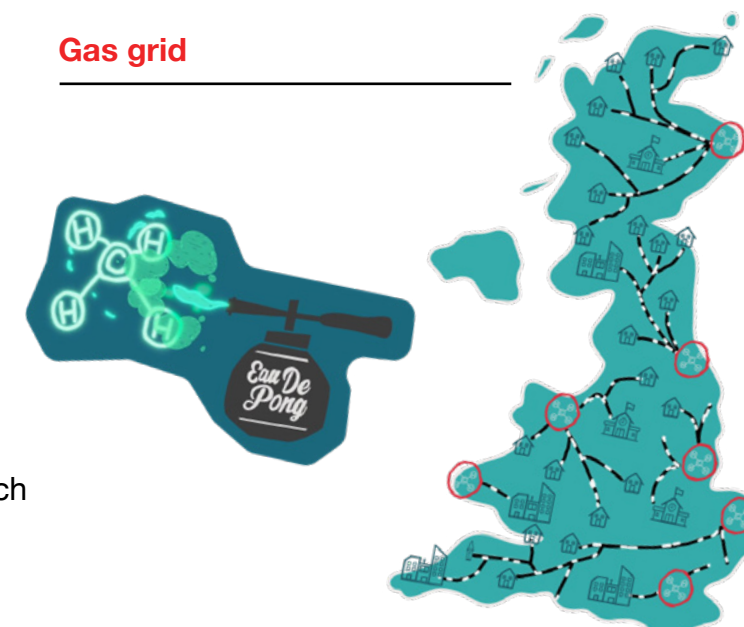
**Human-made activity**

What makes me?

**Oil & gas, mining, agriculture/farming, sewage treatment, landfills.**

What's the secret underground system that delivers energy to our homes through pipelines?

**Gas grid**





Why is too much human-caused methane in our atmosphere bad for the environment?

**Because it contributes to climate change/  
more potent than carbon dioxide**

How can scientists tell how old or new methane is?

**By looking at the atoms to see changes**

When was methane first discovered?

**18th century (1700's-1800's)**

In 1792, what did William Murdock do with Methane?

**Lit up his whole house using coal gas**



Methane is a cleaner fuel than coal or oil. What types of vehicles and machines can run on methane, and what else can it be used for?

**Cars, tractors, rockets,**

**burn for electricity and heat**

What are some of the ways scientists can monitor methane emissions?

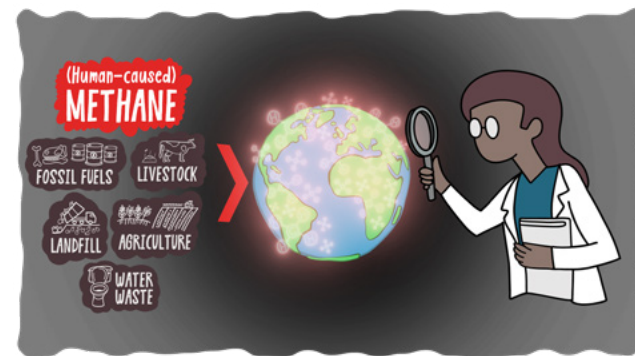
**Cameras & satellites**

How many satellites do GHGSat have orbiting the Earth?

**12**

What does Dan use as an example to show how much methane has stopped being released? Can you remember how many of them?

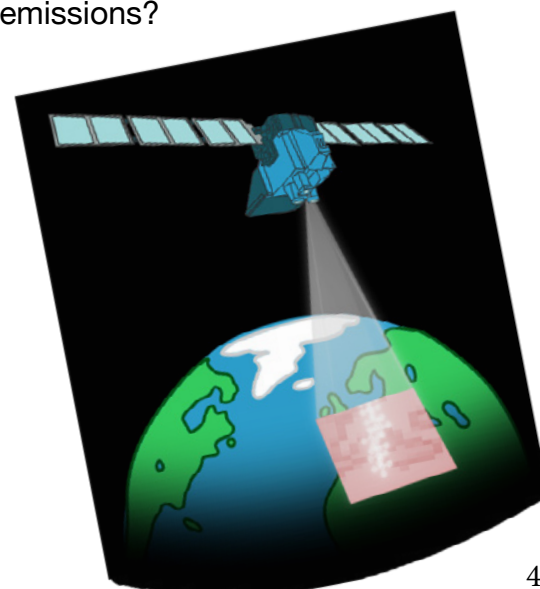
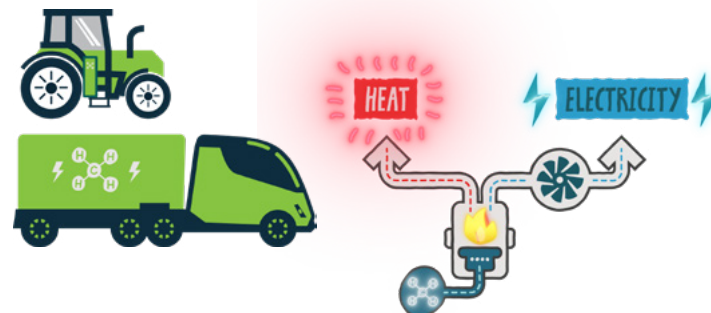
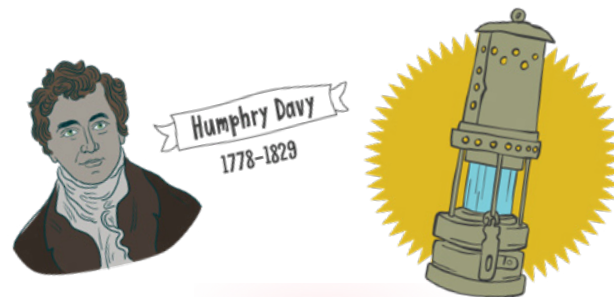
**Cars - 1.5 million**



How many years ago was 1792?

What did Humphry Davy invent to ensure the miners could see underground without the risk of methane explosions?

**The Davy lamp**



How many stomach compartments do grazing animals have?

**Four/4**

Name each compartment of the cow's stomach.

1. **Rumen**
2. **Reticulum**
3. **Omasum**
4. **Abomasum**

What is the process called when organic waste breaks down without oxygen to create biogas?

**Anaerobic digestion**

What are some scientists giving to cows to reduce the amount of methane they burp out?

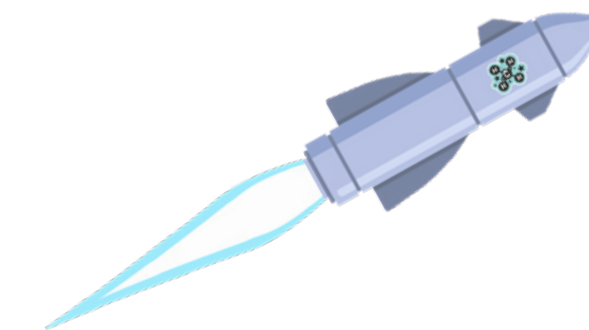
**Seaweed**

What does Bennamann make with the methane they capture?

**Biofuel for tractors**

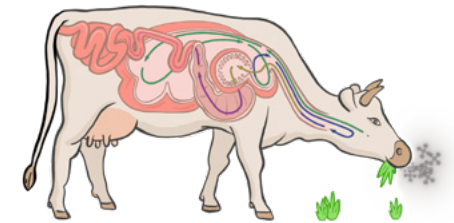
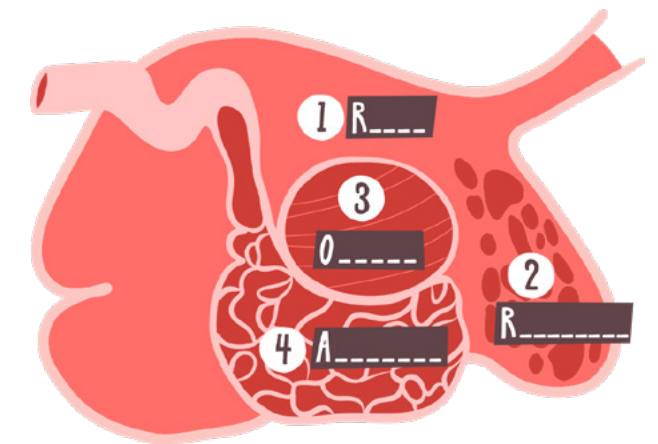
Bennamann helps farmers make energy from their cow poo, but what else can they do with it?

**Use it for fertiliser to grow food**



Which planet (other than Earth) can methane be made on?

**Mars**



What by-products are released by bacteria in the rumen?

**Methane**



What other countries (apart from the UK) are making energy from cow poo?

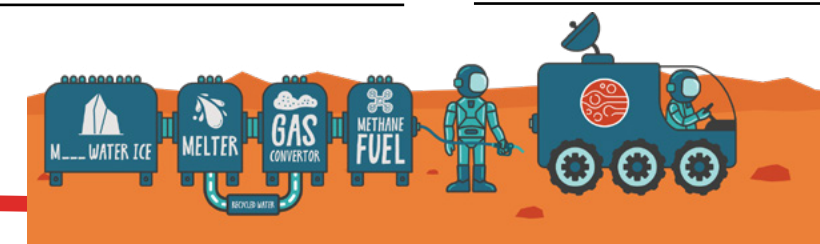
**USA**

Name three reasons why using methane to power rockets is much better than other fuels.

1. **Lighter**
2. **Rockets can be used again, more powerful**
3. **Kinder to the engines**

Why is it important for rockets to be re-usable?

**Saves money and the environment**



Over 100 countries have signed an agreement to cut methane emissions by 30% by 2030. Can you remember its name?

Global Methane Pledge

Which of the methane twins should humans try to keep under control?

☐ Bog

☒ Synth

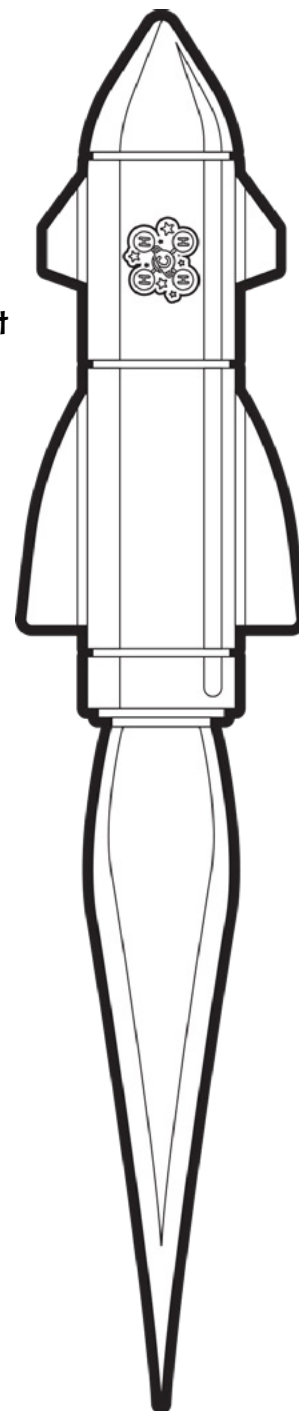
## Keyword word search

Find some of the answers on the word search!

A	C	A	R	B	O	N	D	I	O	X	I	D	E
M	E	C	O	M	A	S	U	M	C	R	M	E	O
A	I	L	Y	F	C	N	A	R	O	B	U	M	R
G	D	I	N	M	I	M	U	S	A	I	L	I	E
A	A	M	A	H	M	M	M	A	L	O	U	S	E
S	A	A	E	A	E	G	R	A	G	F	C	S	E
G	N	T	L	N	I	O	D	C	A	U	I	I	N
R	A	E	A	G	E	L	U	X	S	E	T	O	A
I	E	C	I	N	O	R	R	G	Y	L	E	N	H
D	R	H	G	A	T	O	M	S	L	H	R	S	T
S	O	A	F	E	R	T	I	L	I	S	E	R	E
O	B	N	E	G	O	R	D	Y	H	E	N	Y	M
L	I	G	S	A	T	E	L	L	I	T	E	S	L
B	C	E	S	O	U	D	A	V	Y	L	A	M	P



Design your own  
methane-fuelled rocket  
to go into space!



Davy lamp  
Methane  
Gas grid  
Anaerobic  
Atom  
Emissions  
Biofuel  
Climate Change  
Rumen  
Hydrogen  
Satellites  
Omasum  
Reticulum  
Fertiliser  
Coal Gas

