Dairy Digester Scavenger Hunt and Observations

Grades 4-8

Welcome to the New Hope Dairy. New Hope isn't like other dairy farms. Not only does it produce great tasting milk, but through a partnership with SMUD it makes clean renewable electricity too!. That's important, because as SMUD helps lead our region through its ambitious 2030 zero carbon goal, we are going to need all the help we can get, along with all types of renewable energy.

As you explore SMUD's dairy digester tour at **smud.org/DairyDigester,** take some time to think about how innovative partnerships like this benefit the Dairy, SMUD and our entire community.

Are you ready to find out how SMUD, MAAS Energy and New Hope Dairy are working on creating a clean, carbon free future?

Let's get mooving!

New Hope Dairy

What is California's number #1 agricultural product? _____

Every dairy cow makes about how many pounds of manure every year? _____

Bonus – Can you figure out how many pounds of manure the cow produces every day?

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As the poop breaks down it produces what kind of gas which is harmful to the environment as a greenhouse gas. _____

What are the **three** main operations at the Dairy Farm that are done every day?

1.

2.

3.

What is the name of the featured dairy farm? _____

Bonus – From which country did the dairy family emigrate? _____

At what time of day does work start on the dairy farm? _____

Approximately how many pounds of food does a dairy cow each day? _____

Name a few things that cows eat. _____

Bonus – How are stale bakery items used on the farm? _____

Approximately how many gallons of milk does each cow produce each day? _____

What really causes the very bad smell in dairy farms? Hint: Not the poop. _____

How many times a day do cows get milked? _____

What's the most interesting thing you learned about the cow's life in the free style barn?

_____

MAAS Energy

What does New Hope Dairy provide MAAS Energy? _____

What does MAAS Energy business provide to the dairy farmer? _____

What does MAAS Energy provide SMUD? _____

What are the **four** major steps to turning cow waste into renewable power?

1.

2.

3.

4.

What is the system called which takes the manure down to the central pit?

_____

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What organism makes the methane gas? _____

What is the major activity which happens at the separator and why is this important? _____

_____

What kills the live organisms after all of the liquid has been squeezed out of the solids?

_____

What does, dairy farmer Arlin Groningen think about his work? _____

What does Doug Bryan of MAAS Energy think about his work? _____

Clean renewable energy

Write two ways New Hope Dairy helps to protect the environment from harmful greenhouse gases. _____

_____

What is so important about having on-demand renewable energy sources like Dairy Digesters? Hint: It has to do with timing. _____

What do you think about SMUD's goal of trying to reach zero carbon by 2030? Is it important? What are the biggest challenges? _____

_____

Career path

What are some of the career paths mentioned in the video by either Arlin or Bryant or interpreted from your observations of the transformation of cow manure to energy? List at least five.

1.

2.

3.

4.

5.

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If you enjoyed your learning experience of transforming cow poop to energy, you may enjoy these videos:

Digital resources

How to turn poop into power.
https://www.youtube.com/watch?v=iAZdg969mww

How to make energy from cow poop – by kids
https://www.calacademy.org/educators/renewable-energy-powered-by-poop

How about other kinds of poo?
https://www.youtube.com/watch?v=yh-67zu-kx4

Anerobic vs. aerobic and fermentation
https://www.youtube.com/watch?v=YbdkbCU20_M

What about pig poop?
https://www.youtube.com/watch?v=iAZdg969mww

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