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Science Experiences That Come To You

Bionic Biogas

Ingredients & Supplies:

- Empty jar
- Balloon (don't blow it up!)
- Rubber band
- Spoon
- Raw vegetable scraps (such as carrots, apples, potato peels, broccoli stems, lettuce, etc.)
- ¼ cup soil

Instructions:

Let's make some Bionic Biogas! First, you need some fruit and vegetable scraps. Ask an adult to save some apples, broccoli stems, or lettuce for your experiment.

Mix your food scraps and ¼ cup of soil into a jar. Stir with a spoon.

Stretch the neck of the balloon over the mouth of the jar. Tightly wrap the rubber band around the mouth to secure the balloon. (Ask an adult for help.)

Place the jar in a warm, sunny spot. Windowsills are great.

Now you must watch and wait. After about a week, you'll notice the food scraps break down in the soil. This decay will release gas, and the balloon will gradually fill with biogas!

Science Behind It:

We need fuel or gas to do almost anything in today's world! Think about what you did today. Did you drink juice out of the refrigerator, turn on the faucet to brush your teeth, watch television, and ride in a car? Well, all of those things required some type of energy that uses gas. There are two main categories of gas - renewable and nonrenewable. Some examples of nonrenewable energy sources are coal and oil. Once coal and oil is used for gas and power, it is gone! Renewable sources continue to replenish. Solar, water, and wind are all renewable!

Let's learn about a natural, renewable gas called *biogas*. Scientists called Energy Engineers are now figuring out how to use waste from landfill as a natural gas fuel! As trash, such as food scraps, wood, and farm waste (like cow manure!)



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breaks down and decays, it releases a gas called *biogas*. The Energy Engineers are finding ways to make this biogas into a very useful resource!

There are millions of cows in the United States. What if Energy Engineers could use all of the manure from these cows to make biogas? Well, it could produce billions of kilowatts of electricity! That's enough energy to power millions of homes in the US. That's why many different power companies are currently researching cow manure and biogas.

The process must be regulated using an airtight container and four types of bacteria to properly store and break-down the manure. The decay creates large amounts of methane and carbon dioxide.

Dairy farms already use the cow manure for electricity. A farm with 500 cows produces 8,000 gallons of manure a day! The amount of power generated from this manure is way more electricity than one dairy needs. That's why the extra manure is dried, packed, and sold as fertilizer.

So if the cow manure is so useful, why don't power companies use it? Well, the safe storage and transport is extremely important. Manure can carry unfriendly bacteria. More research must be done before we all can watch television using COW POWER!

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