

Teacher Sheet 1



LAB ACTIVITY:

METHANE: UP CLOSE AND PERSONAL

OBJECTIVE: Students will:

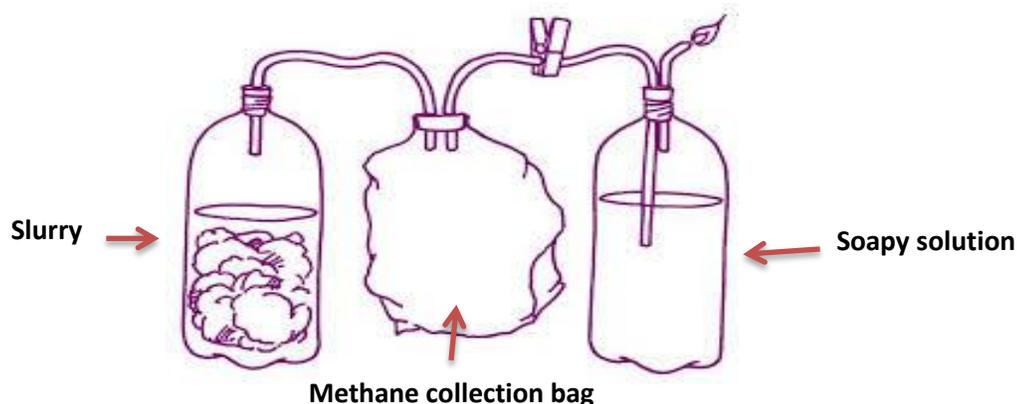
- ✓ Discuss the properties of methane gas
- ✓ Help build a simple methane generation system
- ✓ Determine some of the conditions necessary for the optimum production of methane

MATERIALS:

- ✓ Two plastic pop bottles (2 liter or larger)
- ✓ Manure (goat, sheep, cow manure, fruit or vegetable scraps)
- ✓ Water
- ✓ A large, heavy duty trash bag
- ✓ Three stoppers (two two-hole stoppers and one one-hole stopper (sizes to fit the bottles and bag))
- ✓ Plastic tubing
- ✓ Dish detergent
- ✓ Spring type clothespin or similar clamping device
- ✓ Matches, wooden splints and a meter stick

PROCEDURE: (This is a demonstration activity only students may assist in the preparation.)

1. Assemble the bottles, stoppers, tubing, bag, and clamp as shown below.



Teacher Sheet 2

2. Create slurry of the manure and water in one of the bottles and stopper the bottle. The slurry needs to be kept in a warm place to help in the digestive process.

3. Now place the tubing into the two-hole stopper and a second piece of tubing into the same stopper. Then place the stopper into the bag (tape may be needed to help hold the stopper)

6. Place the tube from the bag into the second stopper.

(This tube needs to extend far enough so the end of the tube will be in the soapy solution. In the early stages of the reaction much of the gas released is carbon dioxide. The solution and the carbon dioxide will form a precipitate. The biogas will pass thru the solution.)

7. Now remove the clothespin or clamp, as bubbles raise through the solution you can light the splint attached to the end of the meter stick and ignite the gas coming from the last tube.

***It is now up to you to decide how you want to continue the demonstration.

- ✓ How long can gas production continue before the digester must be recharged?
- ✓ How much gas does one charge produce?
- ✓ What are the best materials for gas production?
- ✓ Can you collect enough gas to cook something?

8. When you have completed this investigation and discussed the results with the class, students should complete the **OBSERVATIONS** AND **ANALYZE/ASSESS** sections.

