VAPOR CAPERS

wattson's world

Learn about useful gases (such as natural gas) and how to be safe around a fuel that is invisible.

INTRODUCTION:

Natural gas is found underground in natural rock formations. It is thought to be formed from the decayed remains of ancient plants and animals buried deep in the earth where great pressure and heat convert the material to hydrocarbons. Natural gas is actually a mixture of gases, but the primary ingredient is a colorless, odorless gas called methane.

Methane burns hotter and more cleanly than fuels like coal and oil. It also burns smoke free and emits lower levels of potentially harmful byproducts. Released into the atmosphere, it will rise and safely dissipate. These positive attributes make it one of the safest and most efficient-burning fossil fuels available.

Natural Gas is used to heat buildings, cook food, dry clothes, heat water, and even produce electricity. It is the heating choice for over half the homes in the U.S. The benefits of natural gas are hard to beat. But, as with all types of fuel, it's important to become familiar with its safe usage.

Natural gas is non-toxic. But if a leak occurs inside a house and gas gets trapped, breathable air could be replaced with carbon monoxide. Mixed with air, natural gas also becomes combustible and so the slightest spark could ignite it.

While equipment failures that cause leaks are very rare, Avista adds an odorant to natural gas for safety sake. This makes natural gas smell like rotten eggs so people are able to detect even the slightest amount in the air.

Most adults are familiar with the smell of natural gas and know to get outside immediately should they detect a leak. But kids may not know what to do. That's why parents and teachers play a key role in helping youngsters learn about natural gas in their homes in order to stay safe.

The following experiment explores a different type of gas, carbon dioxide, which has the same invisible and odorless properties as natural gas. The lesson is meant to show how some gas leaks are hard to detect, which opens up the conversation of why Avista adds a bad smell to its natural gas and the actions kids should take to avoid potential harm.

MATERIALS:

- 2 flexible drinking straws
- Scissors
- Clay
- Nail
- Drinking glass
- Food coloring
- Baking soda
- Small funnel
- Empty plastic water bottle
- Vinegar

SAFETY TIP:

Have kids tell their parents to be safe around natural gas, too. Explain that adults need to call Avista before digging outside so they don't accidently cut into an underground gas pipe and cause a leak.

CALL IF YOU SMELL OR HEAR A GAS LEAK: (800) 227-9187

811

Know what's **below.**
Call before you dig.

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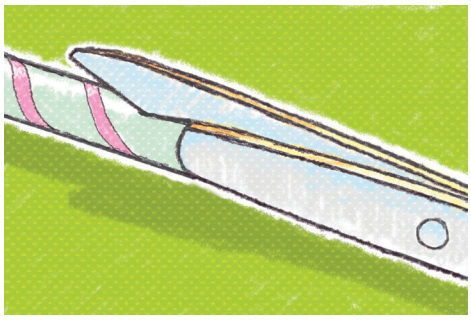
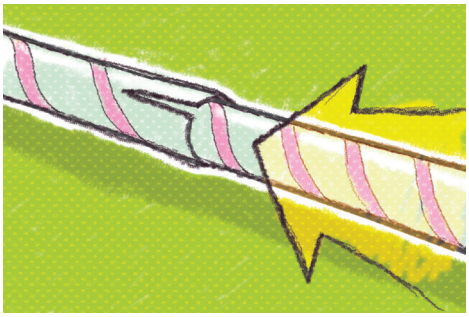
INSTRUCTIONS:

1. Slit the end of one straw using scissors.
2. Fit together both straws into one continuous tube.
3. Fill the drinking glass with water and stir in a few drops of food coloring. (The water should have a lot of color, but not be too dark.)
4. Use the funnel to pour half a tablespoon of baking soda into the plastic water bottle.
5. Add vinegar with the baking soda until the bottle is about half full and quickly seal the bottle with the clay. Seal straw into bottle top with clay.
6. Dip the long end of the straws into the glass with colored water.

RESULT:

The vinegar and baking soda will begin to foam and form carbon dioxide in the plastic bottle. The resulting gas will escape the bottle through the straw in the cork and begin to bubble from the straw submerged in the drinking glass of colored water. The bubbles prove that there is an invisible, odorless gas present.





QUESTIONS AND ACTIVITIES:

1. Give a general explanation of gases compared to liquids and solids, such as ice, water and steam. (Since some kids think of gas as gasoline, you may have to explain how it begins as a liquid but is turned into a gas inside the car motor.)
2. Tell students about a few different types of gases and their uses (Nitrous oxide for medical anesthesia, Freon for refrigerators and air conditioning, even helium for balloons).
3. Tell about natural gas and its uses (furnaces, cook stoves, hot water heaters).
4. Ask who knows if they have a gas furnace or water heater at home.
5. Explain that we all need to learn how to be safe around some types of gases, especially those that burn such as natural gas. (Explain how it makes a blue flame to heat water for the shower, cook food, warm up our houses.)
6. Tell students that many gases—including natural gas--are invisible and have no smell and so it's hard to know when they're around us.
7. Do the carbon dioxide bottle experiment to demonstrate an invisible gas and how only the bubbling lets us know it's there.
8. Ask how can we know when an invisible gas is all around us?
9. Explain how Avista adds a rotten egg smell to natural gas so we can tell if there is a leak, and ask them to describe what they think THAT smells like.
10. Ask why Avista does this? (Because natural gas is flammable which can be dangerous if there is a leak.)
11. Ask what should they do if they smell rotten eggs, or natural gas? (Get out of the house right away. Don't go back inside. Ask a neighbor to call 911 or Avista.)
12. Remind them that natural gas is a good thing and explain that leaks don't happen very often, but that they just need to know how to be safe if there ever is a leak.
13. For a fun activity, ask the kids what smell—besides rotten eggs—would they add to natural gas.

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