

# Natural Gas

# Your Invisible Friend

Activity & Safety Book

fossil  
fuel  
invisible

pipeline

invisible

clean

safety



This important information has been brought to you by your local natural gas provider.

# Natural Gas

## Your Invisible Friend

Natural gas is a colorless, odorless fuel that burns cleaner than other fuels. Natural gas is a source of energy.

### Activity

Add the missing vowels (a, e, i, o, and u) to complete the words below.

#### THIS ENERGY IS USED FOR:

C \_ \_ K \_ NG F \_ \_ D

H \_ \_ T \_ NG H \_ M \_ S & W \_ T \_ R

TR \_ NSP \_ RT \_ T \_ \_ N

M \_ N \_ F \_ CT \_ R \_ NG

*Hint: Read the "Going Further" to help with this activity.*



#### GOING FURTHER

Use your imagination! Make a collage of pictures from magazines that show food being cooked, goods being manufactured, hot water being used, and people or goods being transported.

# Energy in Your Life



## Activity

Unscramble the words in this paragraph:

Energy is the ability to do \_\_\_\_\_.

*rowk*

Energy can make things \_\_\_\_\_.

*vmeo*

When you move, your \_\_\_\_\_ uses energy.

*yodb*

We get our \_\_\_\_\_ from the food we \_\_\_\_\_.

*gyeenr*

*eta*

## Activity

*In a small group, or by yourself, list five activities you did today that required a lot of energy. Record the amount of time spent for each activity. Graph the results.*

### GOING FURTHER

Write a story about what your life would be like without energy. Would anything get accomplished? How would your daily life be changed? What difficulties would you encounter?



# Fossil Fire

## Activity

To complete the story, write each red letter in the box below that matches the red number.

Millions of years <sup>7</sup>ago, even before the dinosaurs, <sup>4</sup>plants and animals died and <sup>8</sup>settled to the bottom of lakes and oceans. <sup>10</sup>

Eventually <sup>2</sup>they were covered <sup>5</sup>by sand and mud. Their bodies decomposed, and as <sup>9</sup>a result of the earth's <sup>6</sup>heat and pressure they were <sup>1</sup>turned into

—	—	—	—	—	—	—
1	2	3	4	5	6	7
—	—	—				
8	9	10				

## Vocabulary

**decompose:** *to rot or decay*

**fossil:** *the remains of an animal*

*or plant that lived long ago*

### GOING FURTHER

#### COMPOSTING PROJECT

Bury objects like a banana skin, piece of plastic, lettuce leaf, etc. Check after five weeks to see which ones decomposed.

# Trapped in Rock

## Activity

Write the number of each underlined word next to its definition.



Natural gas forms when dead plants and animals become buried.

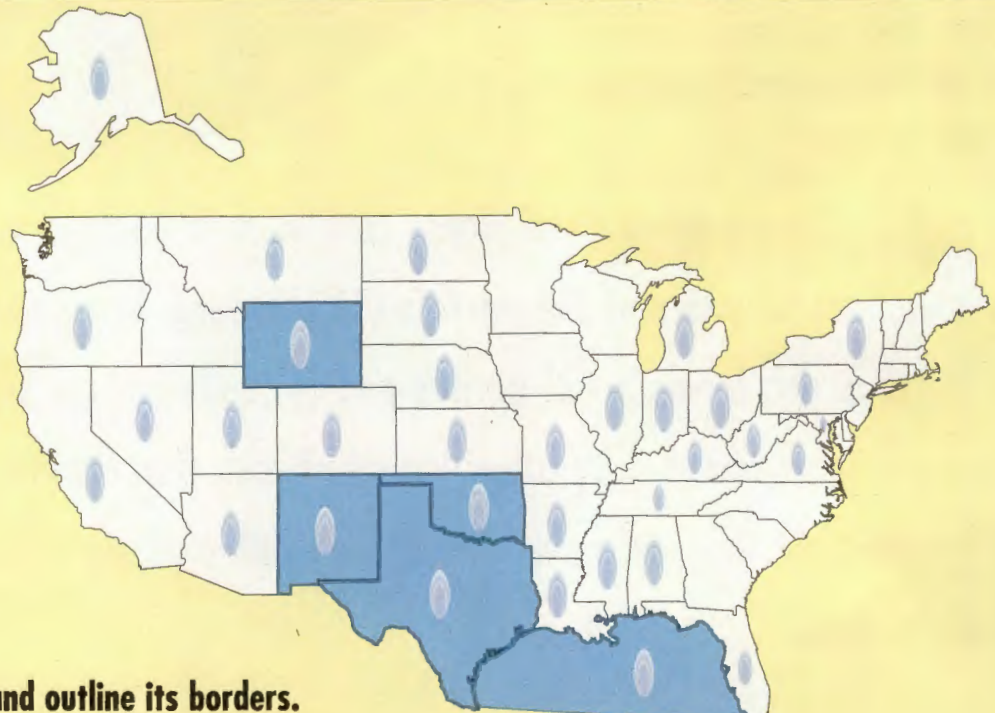
After millions of years of the earth's (1) pressure, heat, and (2) shifting, gas forms in (3) porous and (4) sedimentary rock.

This layer is surrounded by other layers of rock that cannot be (5) penetrated. The gas remains in these small pockets waiting to be discovered.

- \_\_\_\_\_ moving or changing
- \_\_\_\_\_ gone into or passed through
- \_\_\_\_\_ sand, mud, and gravel that are deposited at the bottom of lakes and rivers form this material
- \_\_\_\_\_ full of pores or tiny holes through which water, air, etc. may pass
- \_\_\_\_\_ force caused by one thing pushing against another thing

# Pump It Up

**S**cientists find where natural gas is located. Wells are drilled to bring the gas to the surface. Most of the natural gas we use comes from supplies found in the United States.



**Find your state and outline its borders.**  
**List the five states or other areas that are blue in color.**  
**These blue areas are where the largest natural gas deposits in the United States are found.**

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**How many states are shown on this map to have natural gas deposits?**

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*Hint: Use an atlas or a globe to help with this activity.*

## Gas Math

In 1821 the first commercial well was drilled in Fredonia, New York. It was 27 feet deep.

**How many years ago was the first commercial well in the United States drilled?**

## How Many Digits?

There are over one million miles of pipeline in the United States that send natural gas to be used throughout the country.

**How can you write the number one million using digits?**

# Color It a Clean Blue

**W**hen natural gas comes out of the ground it is colorless, odorless, and tasteless. A chemical odor that smells like rotten eggs is added to the gas so we can smell it easily in case it leaks.

Natural gas is \_\_\_\_\_ in its natural state.

Natural gas burns cleanly and the flame looks blue.

## Activity

*Cross out only the letters that appear twice. The letters that remain spell out the missing word.*

Z	I	J	N	G
V	I	G	A	S
Z	O	R	I	C
J	A	B	C	L
R	E	M	O	M

## Gas Pipeline Safety

**L**eaks from natural gas pipelines, although rare, can be a fire hazard. Be alert for any of the warning signs below, and learn what to do in case a natural gas leak occurs in your community.

### Gas Leak Warning Signs

- A sulfur-like or rotten-egg smell
- A hissing or roaring sound
- Dirt spraying or blowing into the air
- Continual bubbling in water
- Grass or plants dead or dying for no apparent reason

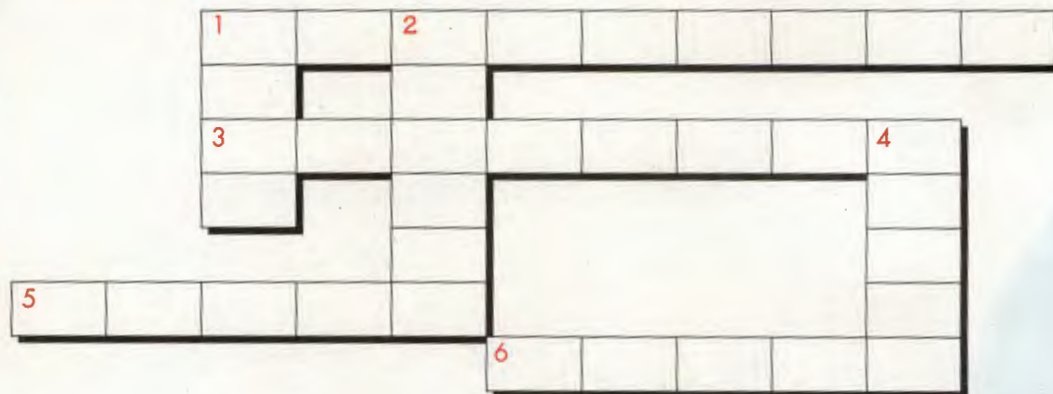
### What to Do

- Do not use electricity or fire. Even the tiniest spark from a phone, flashlight, electrical appliance, or match could ignite the gas.
- Go far away from the area immediately and do NOT go back until safety officials say it is safe.
- Ask a trusted adult to report the leak to 911 and the local natural gas utility.

# Natural Gas Power

Natural gas is a clean fuel. We use natural gas in our homes, businesses, schools, and transportation.

## Crossword Puzzle Activity



### Across

1. Natural gas manufactures goods in \_\_\_\_\_.
3. Natural gas generates \_\_\_\_\_ power.
5. Natural gas \_\_\_\_\_ cakes and cookies.
6. Natural gas \_\_\_\_\_ offices in the winter.

### Down

1. Natural gas is used as a \_\_\_\_\_ for cars and buses.
2. Natural gas heats the water that \_\_\_\_\_ clothes in washing machines.
4. Natural gas \_\_\_\_\_ us in summer.

### Word List

bakes	cools	factories	heats
cleans	electric	fuel	

### GOING FURTHER

Investigate how natural gas is used to generate electricity. Find out if any of the electricity provided by your local electric utility is generated from natural gas.



# NGVs\* Get Us There!



\* NGVs are Natural Gas Vehicles.

## Activity

1. Find the answer to each problem.
2. Write the letter from the box under the number it goes with.
3. The first one is done for you.

How many days in a week?	7	= N
Divide 96 by 3		= P
Add 254 and 110		= M
Subtract 24 from 88		= L
How many hours in a day?		= S
Multiply 15 x 4		= H
Divide 48 by 4		= I
Add 114 and 52		= R
How many states in the U.S.?		= A
Subtract 101 from 207		= U
Multiply 24 x 3		= F
Add 925 and 1324		= T
What number is 100 greater than 118?		= O

**Using natural gas to fuel vehicles is a good way to reduce...**

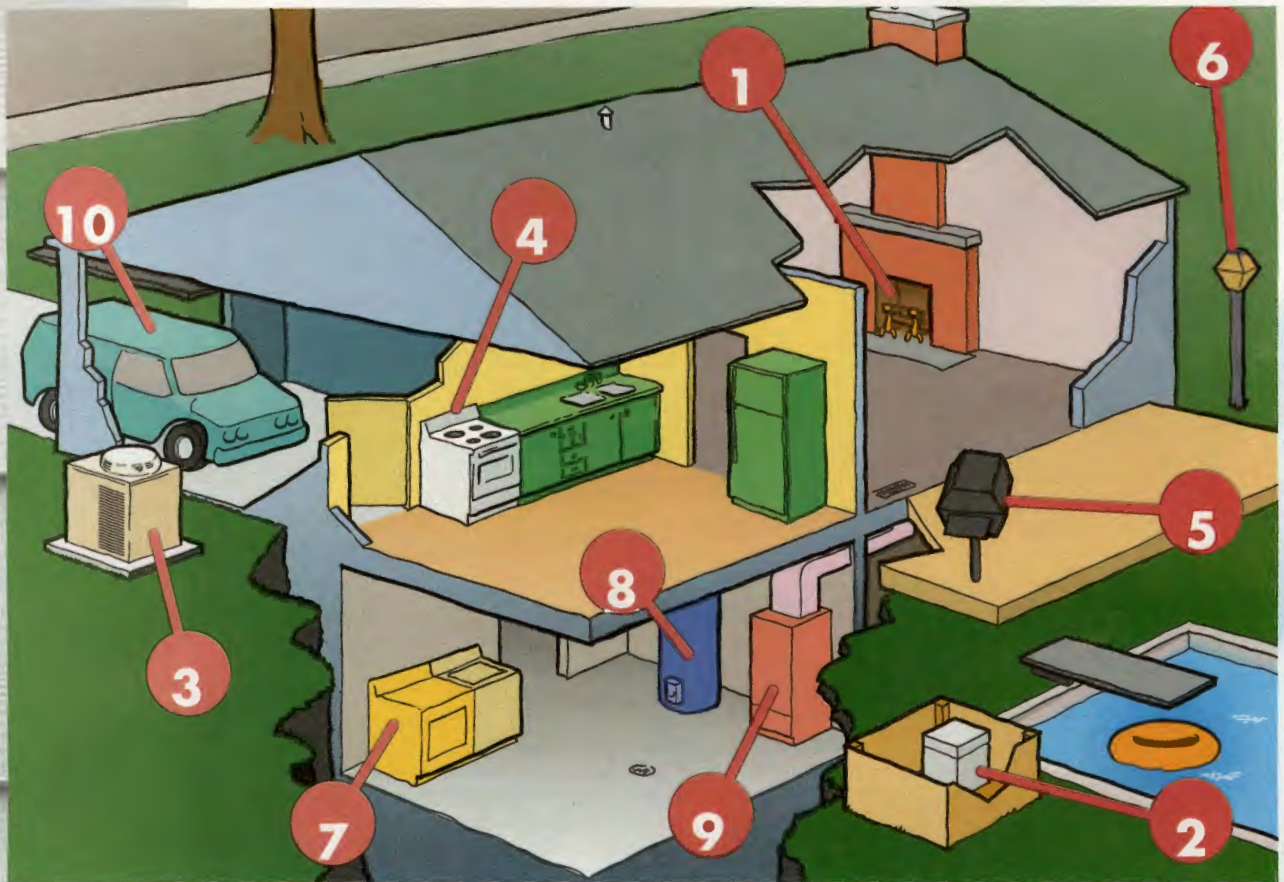
60	50	166	364	72	106	64

50	12	166

32	218	64	64	106	2249	50	7	2249	24
							N		

# Home Sweet Home

Natural gas has many uses in and around the home.



## Activity

Write the number from the picture next to each use of natural gas.

Air Conditioner

Barbecue Grill

Pool Heater

Clothes Dryer

Furnace

Lights

Fireplace

Range

Vehicle

Water Heater

### GOING FURTHER

Interview family members and friends about what fuels they use in their homes and why they prefer them. Write your findings in your journal.

# Natural Gas Is Great

## Activity

Who says what? Match the people's statements with their descriptions.

- A. Office Building Owner
- B. Pizza Restaurant Manager
- C. Hotel Manager
- D. Bus Rider
- E. Popcorn Plant Manager



\_\_\_\_\_ "We use natural gas here as an ideal kind of heat for cooking."

\_\_\_\_\_ "It is more efficient for heating and cooling our offices and it saves us money."

\_\_\_\_\_ "Our guests like the temperature control and humidity controls in their rooms."

\_\_\_\_\_ "It's a safe, clean, efficient fuel to use in our plant."

\_\_\_\_\_ "I like the fact that while I commute to work I am using a natural gas vehicle that reduces harmful air pollutants."

## Activity

Make a list of all the benefits of natural gas mentioned on this page. Which do you think are the most important reasons for using natural gas instead of other fuels? Explain your opinion to other students.



# Lighter Than Air

Everything in the world exists in one of three different states: solid, liquid, or gas. These are the three states of matter. Matter in the gas state is lighter than air, so when natural gas is released it dissipates into the air.

## Activity

*Put each word in the picture above in its correct category.*

**Solids**

**Liquids**

**Gases**

_____	_____	_____
_____	_____	_____
_____	_____	_____

## Activities

*Fill a glass with cold water. Add one drop of food coloring. Observe the way the color spreads through the water. This is similar to the way natural gas dissipates into the air.*

*Blow up a balloon, tie it, and toss it into the air. Did it float? Discuss what happened to the balloon and why.*

### GOING FURTHER

**In an automobile accident, if the fuel line in a car breaks, why is it safer to have natural gas rather than gasoline as a fuel?**

# Smart Gas Use

**N**atural Gas is a nonrenewable energy source, which means that someday our supply of it will run out. That is why it is good to practice conserving it.

## Activity

Each blank is a letter. To find the secret message, first complete the sentences. Then put the letters in the numbered spaces in the box below.

1. Natural gas is used as a source of \_\_\_ n \_\_\_ \_\_\_ y.  
21 11 4 6
2. Natural gas began forming \_\_\_ lli \_\_\_ \_\_\_ of years ago.  
12 26 27 15 8
3. NGVs are \_\_\_ \_\_\_ \_\_\_ r \_\_\_ l \_\_\_ g \_\_\_ \_\_\_ ehi \_\_\_ le \_\_\_.  
28 3 25 9 14 24 1 23 17 16
4. Natural gas is used as a fuel in h \_\_\_ \_\_\_ \_\_\_ , schools, and businesses.  
18 2 13 20
5. Natural gas is also used as fuel for \_\_\_ \_\_\_ \_\_\_ portation.  
5 22 7 19 10

1	2	3	4	5	6	7	8				
9	10	11	12	13	14	15	16				
17	18	19	20	21	22	23	24	25	26	27	28

## GOING FURTHER

1. List everything in your house that uses energy.
2. Read your gas meter at 7:00 a.m. and 7:00 p.m. (or another convenient time in the morning and evening) on two different days. Did your household use the same amount of gas on these days?
3. Work out a plan with your family for how you can save energy. For example, setting your thermostat at 68° will keep you warm and comfortable and save energy, too.

# Safety First

**N**atural gas appliances are safe, efficient, and **N**economical. It is important to know how to use natural gas safely and prevent hazards.

## Activity

Fill in the missing letter of each incomplete word. Then write the letters in the boxes below.

Keep the area around **\_ our** appliances  
**cl \_ an** and litter **\_ ree**.

Children should never **pl \_ y** around  
**na \_ ural** gas appliances and **pipe \_**.

--	--	--	--	--	--

Unscramble the letters you added to find the secret word.

## Call Before You Dig

If people dig into natural gas pipelines, the gas can leak out and cause a fire hazard. So if someone you know is planning a digging project, remind them to call the underground utility locator service at 811 several days before digging. This service makes sure underground gas pipelines and other utilities are clearly marked so people can dig a safe distance away.



Know what's below.  
Call before you dig.

### GOING FURTHER

In a small group, or by yourself, come up with creative ways to get people to practice natural gas safety.

# Smell, Leave, and Tell

## Activity

Start with the letter "G" at the top of the circle and go clockwise writing down every third letter in the spaces below.



## IF YOU SMELL GAS...

**G** \_\_\_\_\_

**1 2**

\_\_\_\_\_

\_\_\_\_\_

!

If you smell gas or notice any other gas leak warning signs in or around your home, tell an adult. If no adult is home, get everyone out of the house and go to a safe location to call the local natural gas utility.

Remember, don't use a light switch, candle, flashlight, TV, radio, garage door opener, or even a phone.

### GOING FURTHER

Discuss why it would be hazardous to use candles, lights, or electrical appliances if you suspect a natural gas leak.

# Natural Gas P P! t

## Activity

Find the words in the list. They have been hidden horizontally, vertically, and diagonally.

### Natural Gas Word List

- BLUE
- BUS
- CLEAN
- COLORLESS
- COOKING
- ELECTRIC
- ENERGY
- FOSSIL
- FUEL
- HEATING
- INVISIBLE
- LEAVE
- MANUFACTURING
- NATURAL GAS
- PIPELINE
- ODORLESS
- SAFETY
- SEDIMENTARY
- SMELL
- TELL
- TRANSPORTATION
- WORK

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

## Answer Key

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

- PAGE 12 SOLIDS: CHALK, ERASER, PENCILS; LIQUIDS: JUICE, MILK, WATER; GASES: HELIUM, NITROGEN, OXYGEN
- PAGE 13 1. ENERGY, 2. MILLIONS, 3. NATURAL GAS VEHICLES, 4. HOMES, 5. TRANSPORTATION, SMART GAS USE MEANS CONSERVATION
- PAGE 14 Y, E, F, A, T, S, SAFETY
- PAGE 15

- PAGE 2 COOKING FOOD, HEATING HOMES & WATER, TRANSPORTATION, MANUFACTURING
- PAGE 3 WORK, MOVE, BODY, ENERGY, EAT
- PAGE 4 NATURAL GAS
- PAGE 5 2.5, 4.3, 1
- PAGE 6 TEXAS, GULF OF MEXICO, NEW MEXICO, WYOMING, OKLAHOMA, 32, CHANGES EACH YR, 1,000,000
- PAGE 7 INVISIBLE
- PAGE 8
- PAGE 9 7, 32, 364, 64, 24, 60, 12, 166, 50, 106, 72, 2249, 218, HARMFUL AIR POLLUTANTS
- PAGE 10 3, 5, 2, 7, 9, 6, 1, 4, 10, 8
- PAGE 11 B, A, C, E, D