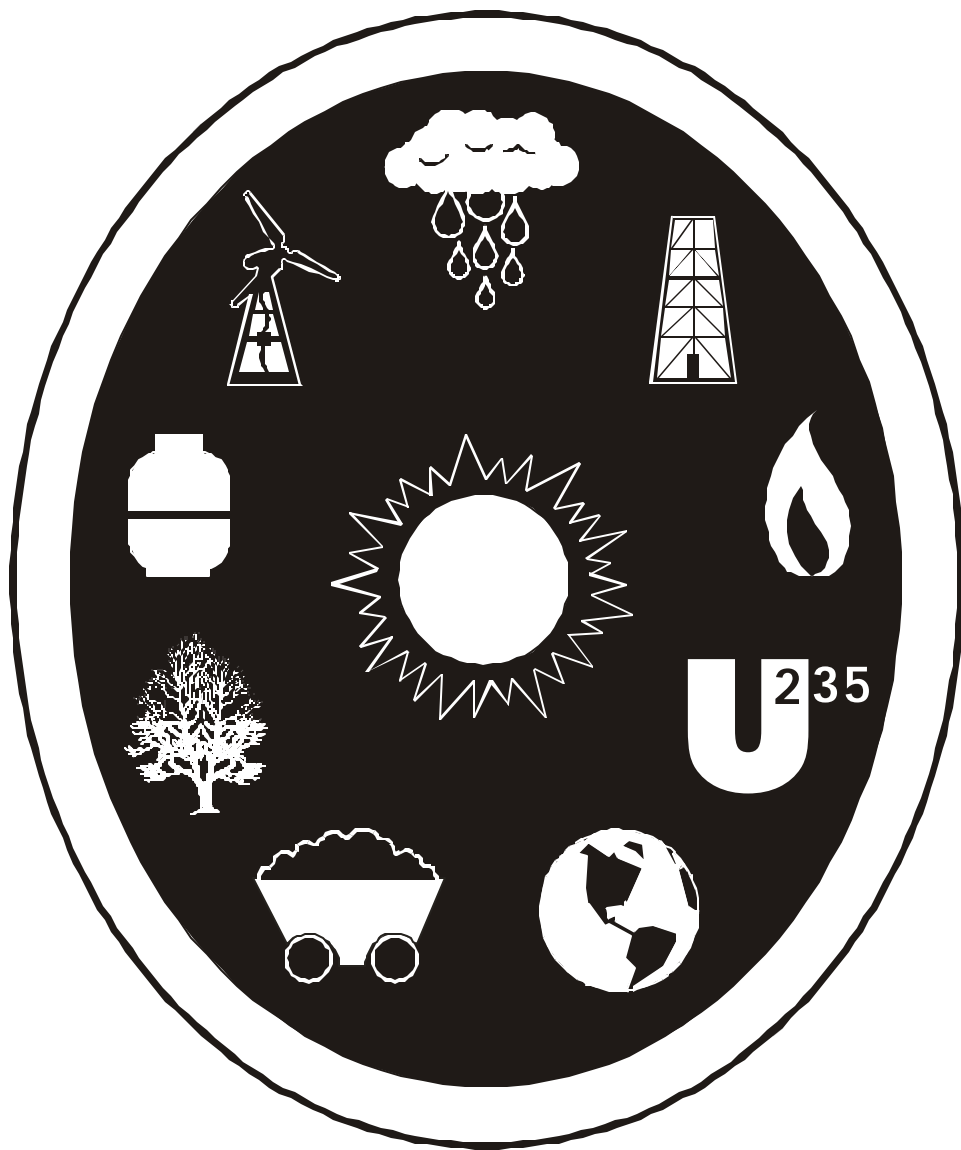


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# INTERMEDIATE ENERGY ACTIVITIES

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This workbook belongs to: \_\_\_\_\_

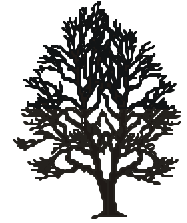
# FORMS OF ENERGY

Fill in the blanks with the words at the bottom of the page. You can use words more than once.

1. Stored energy and the energy of position are \_\_\_\_\_ energy.
2. Compressed springs and stretched rubber bands are stored \_\_\_\_\_ energy.
3. The vibration and movement of the atoms and molecules within substances is called heat or \_\_\_\_\_ energy.
4. The energy stored in the center of atoms is called \_\_\_\_\_ energy.
5. The scientific rule that states that energy cannot be created or destroyed is called the Law of \_\_\_\_\_.
6. The movement of energy through substances in longitudinal waves is \_\_\_\_\_.
7. The energy of position - such as a rock on a hill - is \_\_\_\_\_ energy.
8. The movement of objects and substances from place to place is \_\_\_\_\_.
9. Electromagnetic energy traveling in transverse waves is \_\_\_\_\_ energy.
10. Energy stored in the bonds of atoms and molecules is \_\_\_\_\_ energy.
11. The movement of atoms, molecules, waves, and electrons is \_\_\_\_\_ energy.
12. The movement of electrons is \_\_\_\_\_ energy.
13. The amount of useful energy you get from a system is its \_\_\_\_\_.
14. The energy in petroleum and coal is stored as \_\_\_\_\_ energy.
15. X-rays are an example of \_\_\_\_\_ energy.
16. Fission and fusion are examples of \_\_\_\_\_ energy.
17. A hydropower reservoir is an example of \_\_\_\_\_ energy.
18. Wind is an example of the energy of \_\_\_\_\_.

radiant	gravitational	chemical	thermal	nuclear	electrical	mechanical
kinetic	potential	sound	motion	conservation of energy	energy efficiency	

# BIOMASS



Description of biomass:

Renewable or nonrenewable:

Ways we turn biomass into energy we can use:

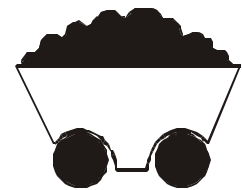
Who uses biomass and for what purposes:

Effect of using biomass on the environment:

Important facts about biomass:

---

# COAL



Description of coal:

Renewable or nonrenewable:

Where coal is located and how we recover it:

Ways we turn coal into energy we can use:

Who uses coal and for what purposes:

Effect of using coal on the environment:

Important facts about coal:

# GEOHERMAL



Description of geothermal energy:

Renewable or nonrenewable:

Where geothermal resources are located and how we recover them:

Ways we turn geothermal resources into energy we can use:

Who uses geothermal energy and for what purposes:

Effect of using geothermal energy on the environment:

Important facts about geothermal energy:

---

# HYDROPOWER



Description of hydropower:

Renewable or nonrenewable:

Description of the water cycle:

Ways we turn hydropower into energy we can use:

Who uses hydropower and for what purposes:

Effect of using hydropower on the environment:

Important facts about hydropower:

# NATURAL GAS



Description of natural gas:

Renewable or nonrenewable:

Where natural gas is located and how we recover it:

Ways we turn natural gas into energy we can use:

Who uses natural gas and for what purposes:

Effect of using natural gas on the environment:

Important facts about natural gas:

---

# PETROLEUM



Description of petroleum:

Renewable or nonrenewable:

Where petroleum is located and how we recover it:

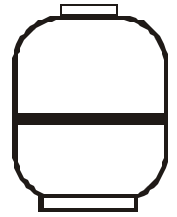
Ways we turn petroleum into energy we can use:

Who uses petroleum and for what purposes:

Effect of using petroleum on the environment:

Important facts about petroleum:

# PROPANE



Description of propane:

Renewable or nonrenewable:

Where propane is located and how we recover it:

Ways we turn propane into energy we can use:

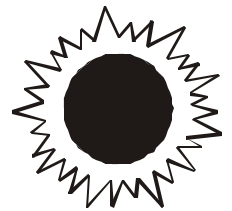
Who uses propane and for what purposes:

Effect of using propane on the environment:

Important facts about propane:

---

# SOLAR



Description of solar energy:

Renewable or nonrenewable:

How solar energy is produced and how we recover it:

Ways we turn solar energy into energy we can use:

Who uses solar energy and for what purposes:

Effect of using solar energy on the environment:

Important facts about solar energy:

# URANIUM



Description of uranium:

Renewable or nonrenewable:

Where uranium is located and how we recover it:

Ways we turn uranium into energy we can use:

Who uses uranium and for what purposes:

Effect of using uranium (nuclear energy) on the environment:

Important facts about uranium (nuclear energy):

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# WIND



Description of wind energy:

Renewable or nonrenewable:

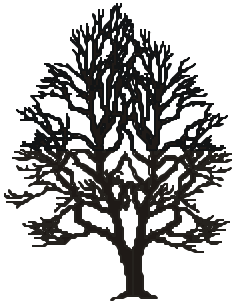
How wind energy is produced and how we recover it:

Ways we turn wind into energy we can use:

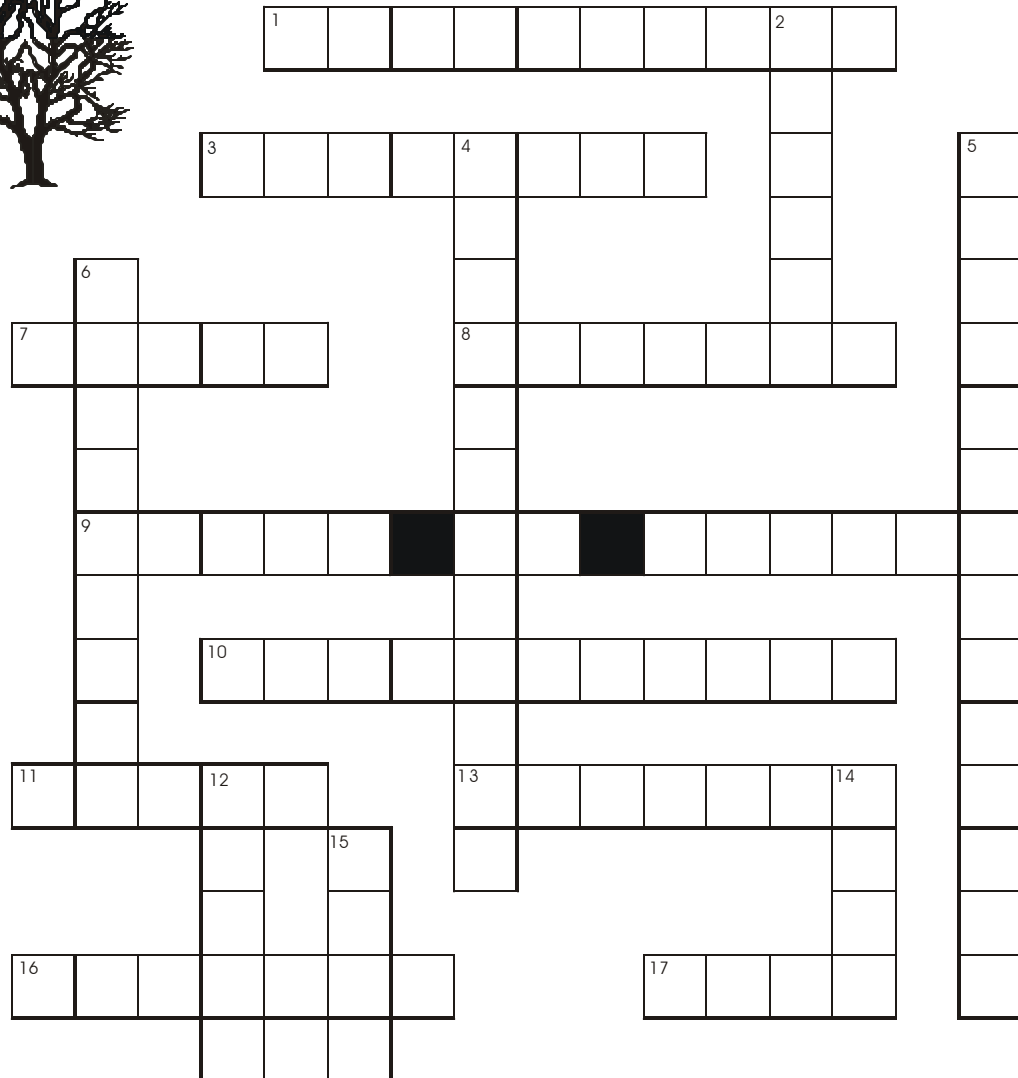
Who uses wind energy and for what purposes:

Effect of using wind energy on the environment:

Important facts about wind energy:



# BIOMASS



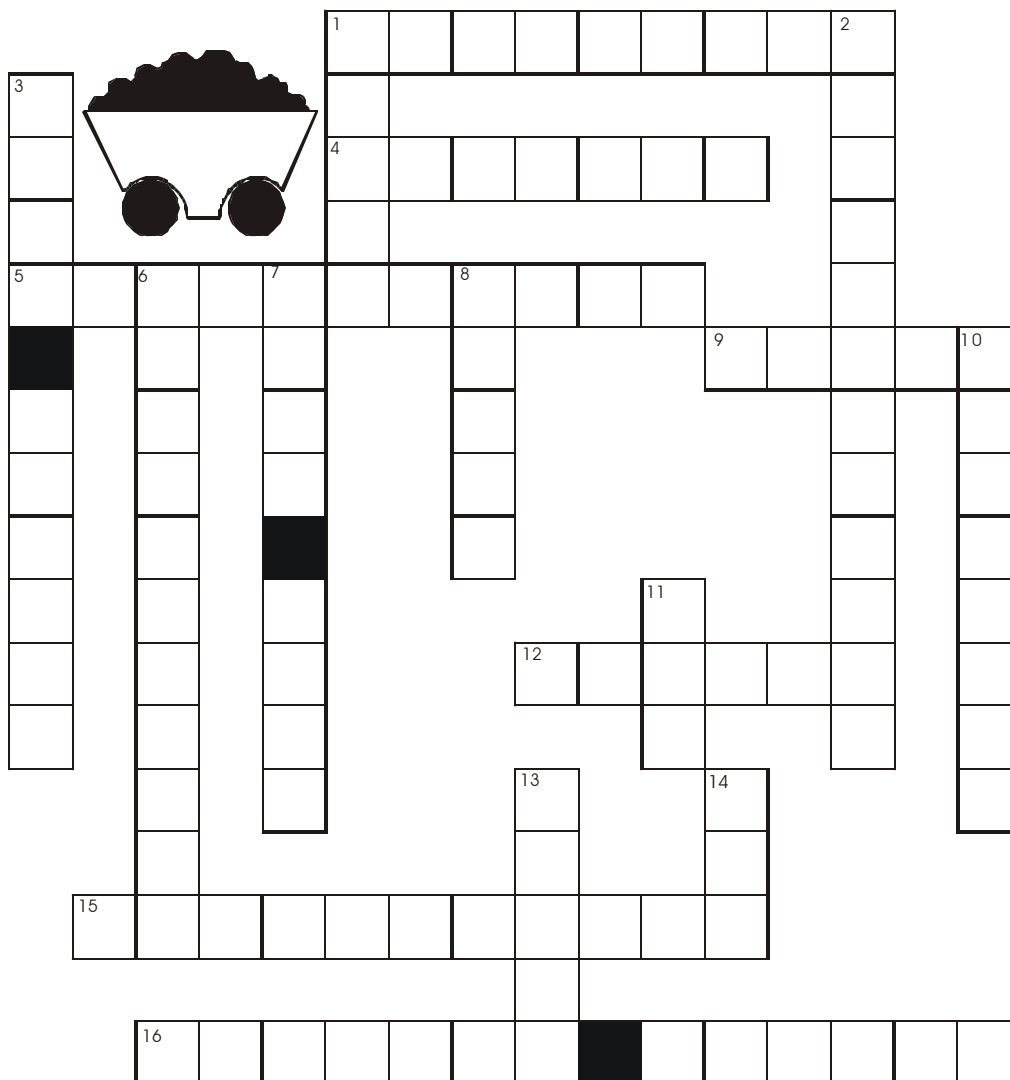
## ACROSS

1. Change or transformation
3. Modern dump
7. Decompose or rot
8. Gas produced by organic decay
9. Plant that burns waste to produce electricity
10. Moving electrons
11. Bacteria used to ferment fruits and grains
13. Living or once-living
16. Liquid alcohol fuel
17. To set on fire

## DOWN

2. Gas needed for combustion
4. Process of making alcohol with yeast
5. Process of converting solar energy into glucose
6. Can be replenished in a short time
12. Glucose is one
14. Grain used to make ethanol
15. Main type of biomass

# COAL



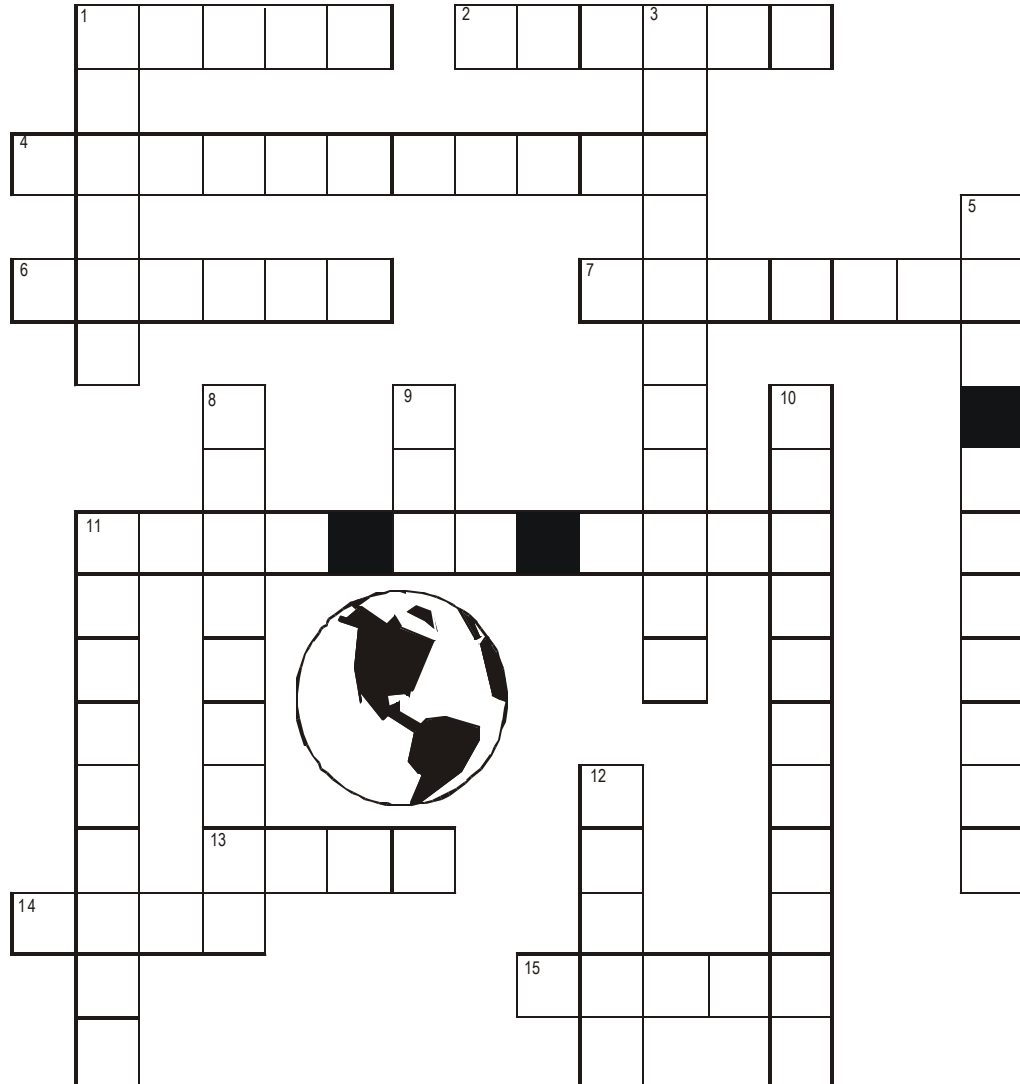
## ACROSS

1. Substances damaging to the environment
4. Number one coal-producing state
5. Plant that cleans coal
9. Worker that takes coal from the ground
12. Kind of fuel made from ancient plants
15. Energy-rich mixture of carbon and hydrogen
16. How shallow coal is removed

## DOWN

1. Electricity is made in a \_\_\_\_\_ plant
2. Can't be quickly replenished
3. How coal is removed from deep under the ground
6. Main use of coal
7. A potential impact of burning coal
8. Moves coal over land
10. Coal still in the ground
11. Residue of burned coal
13. Water-based coal mover
14. Where energy in coal originated

# GEOHERMAL



## ACROSS

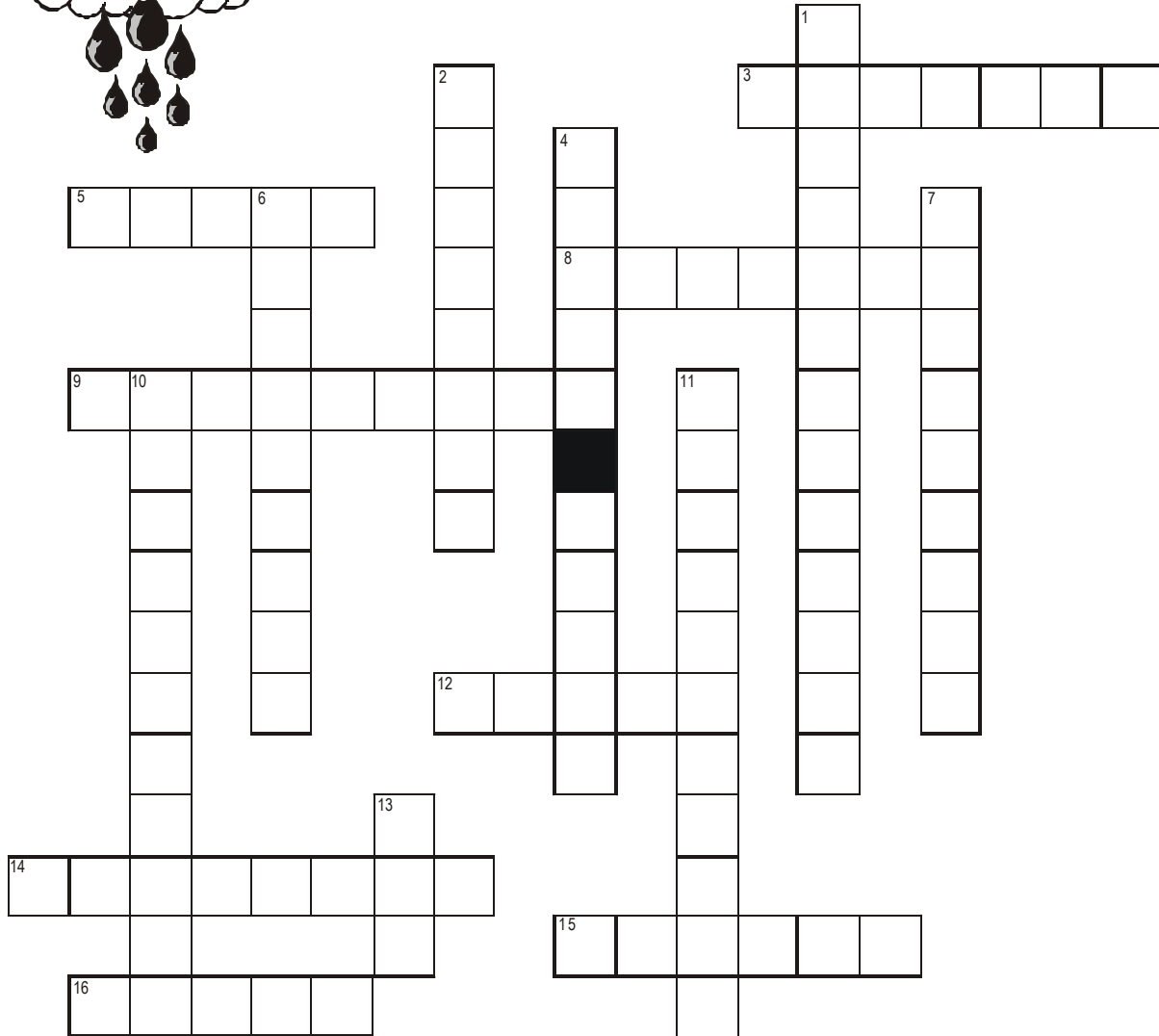
1. Melted iron
2. Greek word for heat
4. Where geothermal energy is located
6. The Earth's crust is in giant pieces called \_\_\_\_
7. Mountain with geothermal energy
11. Area of Pacific with geothermal resources
13. Produced by volcanoes
14. Center of the earth
15. Outer layer of the earth

## DOWN

1. Earth layer with magma and rock
3. Geothermal energy is caused by \_\_\_\_ decay
5. Geothermal resource good for bathing
8. Replenished in a short time
9. Greek word for earth
10. Produced by geothermal plant
11. Underground geothermal pool
12. Greek word for water



# HYDROPOWER



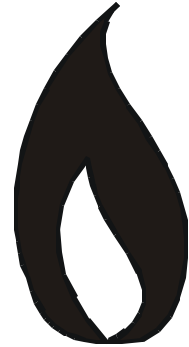
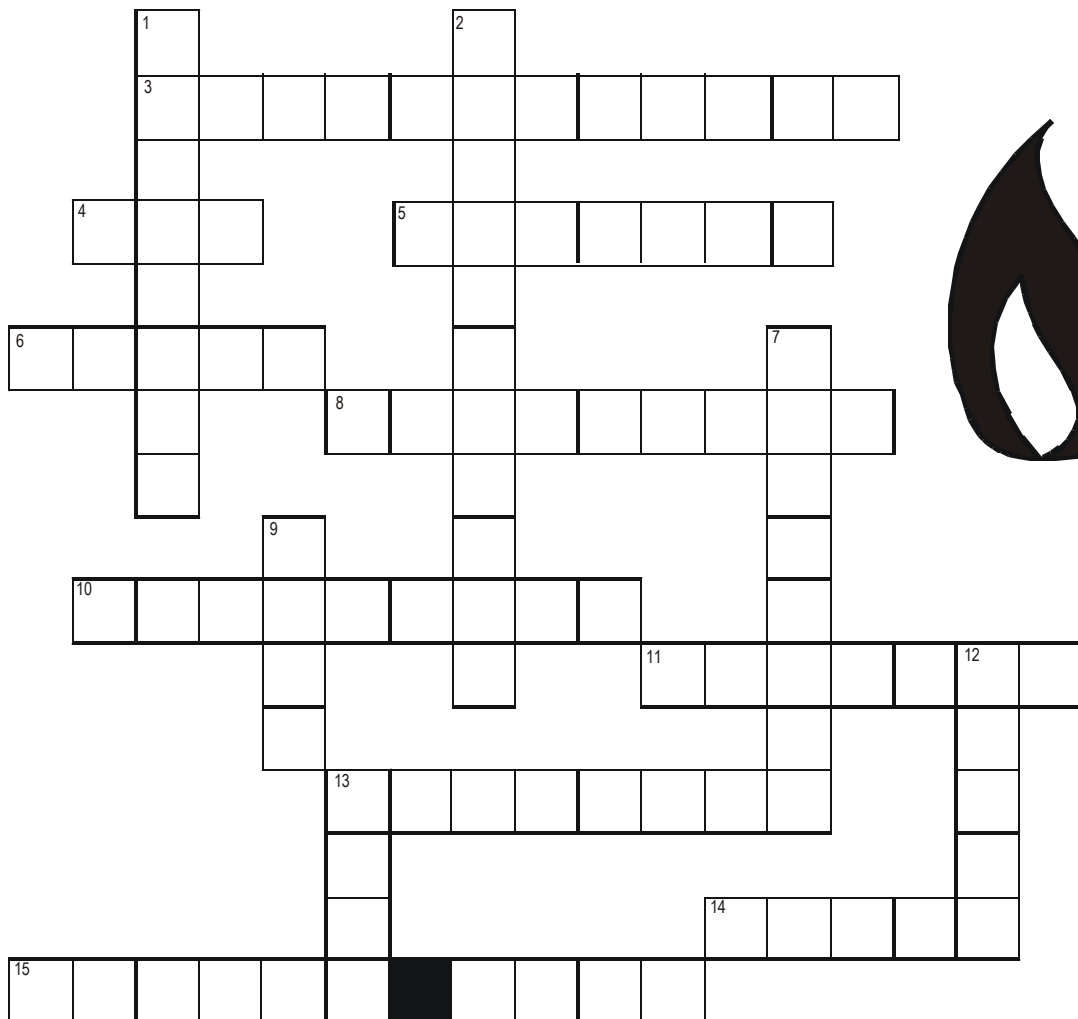
## ACROSS

3. Force that moves water
5. Dams can \_\_\_\_ energy until its needed
8. Moving water spins the blades of this
9. Lake behind a dam
12. This energy powers the water cycle
14. Part of a dam for extra or overflow water
15. Dams can control these dangerous events
16. Greek word for water

## DOWN

1. Rain, snow, sleet, or hail
2. Giant tube in a hydropower plant
4. Movement of water through the atmosphere and earth
6. Replenished in a short time
7. Has magnets and coils of copper wire
10. Produced by generator
11. Water changing from liquid to gas
13. Large structure across a river

# NATURAL GAS



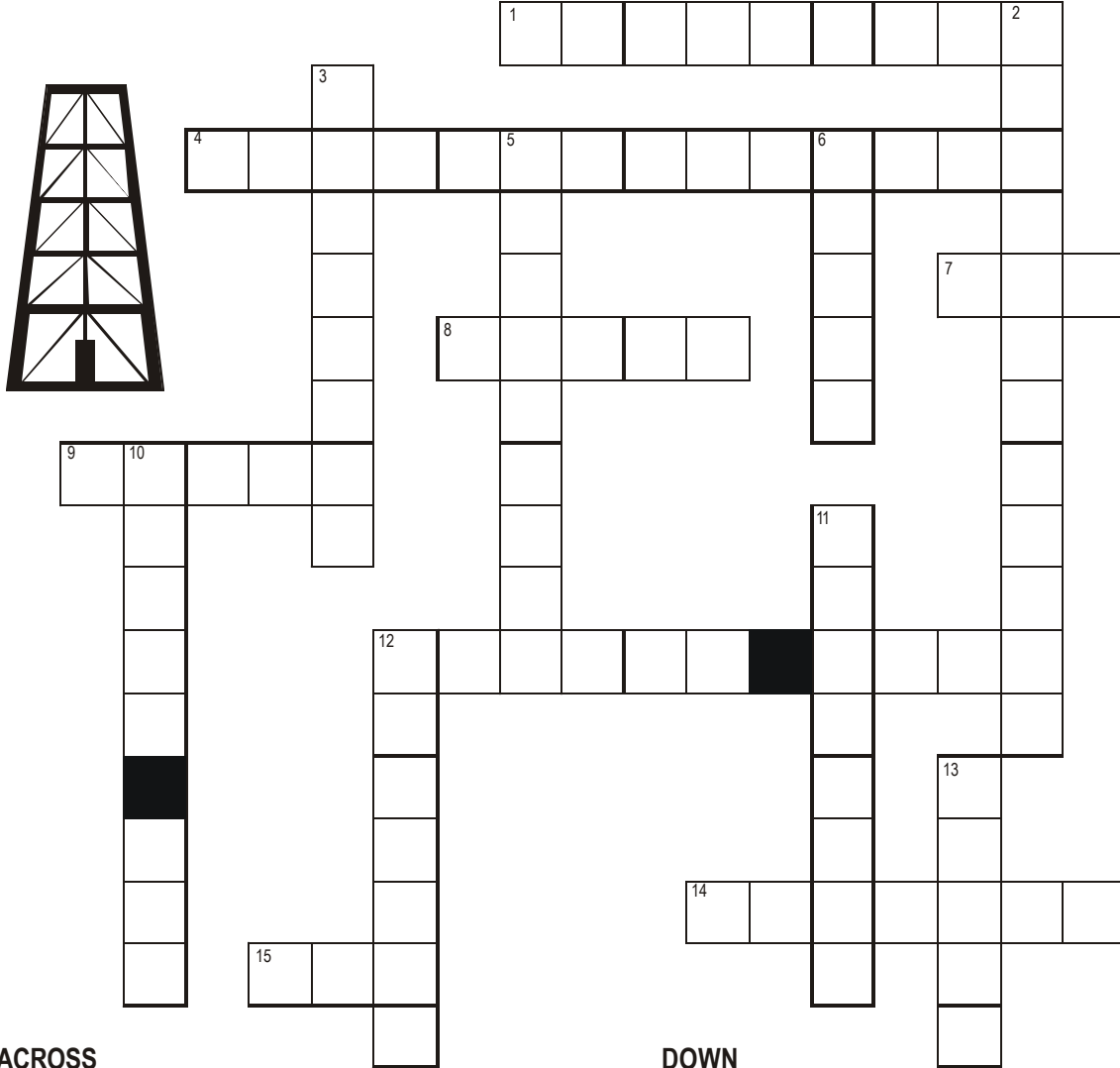
## ACROSS

3. Can't be replenished quickly
4. Energy in natural gas originated here
5. Main ingredient of natural gas
6. Device to measure natural gas usage
8. Strong-smelling additive to natural gas
10. How most natural gas is moved
11. Company that sells natural gas to consumers
13. Form in which energy is stored in natural gas
14. Many \_\_\_\_ use natural gas for heat
15. Remains of ancient plants and animals

## DOWN

1. Largest user of natural gas
2. Where natural gas is usually found
7. Producer of renewable methane (organic decay)
9. Most natural gas is burned for \_\_\_\_
12. Number one natural gas producing state
13. Natural gas is sometimes found with this solid fossil fuel

# PETROLEUM



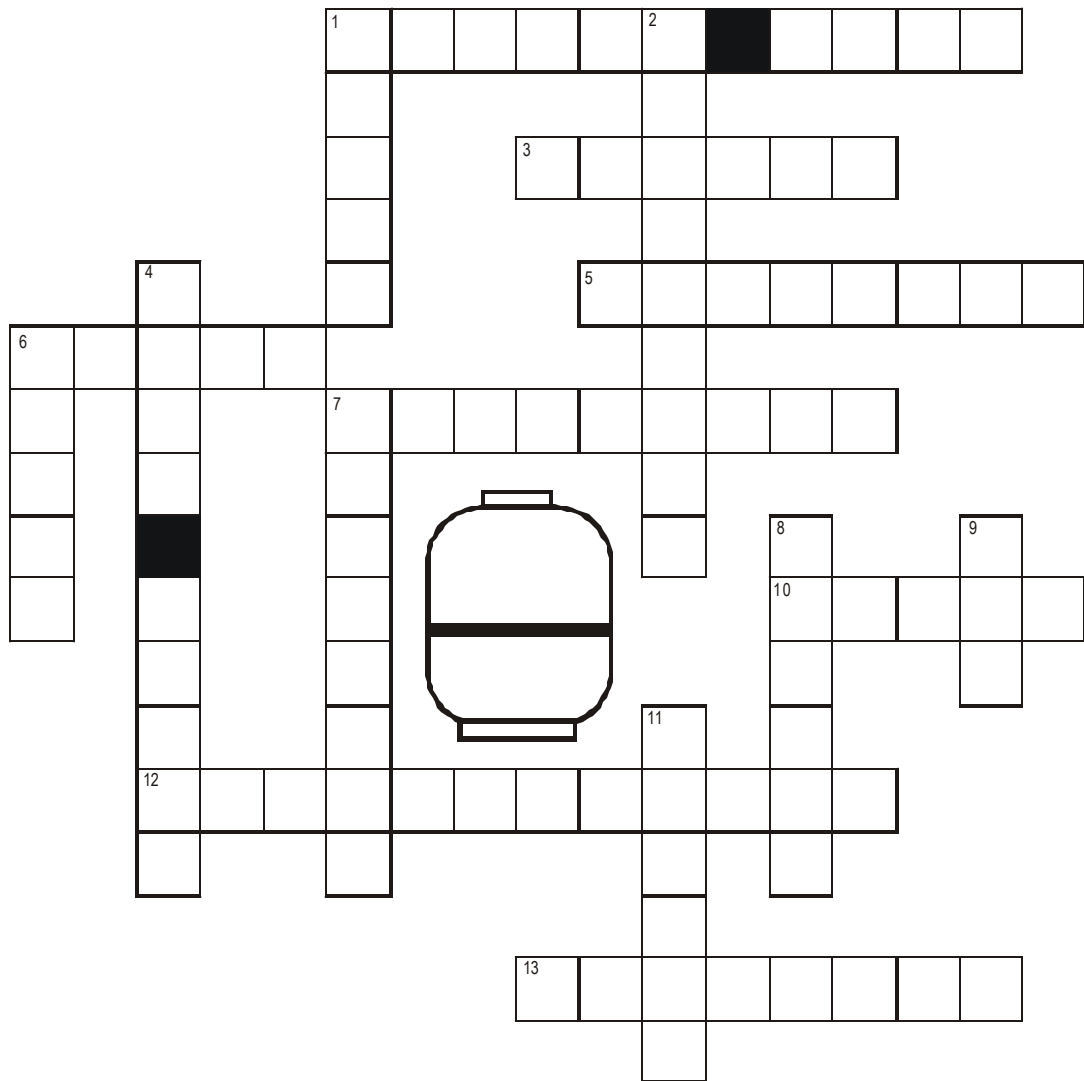
## ACROSS

1. Possible environmental effect of burning petroleum
4. Economy sector that uses most petroleum
7. Petroleum is distilled into \_\_\_\_ fuel for flight
8. These are dug to find oil
9. Much of our oil is under the \_\_\_\_
12. Made from ancient plants and animals
14. Houses drilling equipment
15. Used to reach offshore oil

## DOWN

2. Not replenishable in a short time
3. Main product of petroleum refinery
5. These transport oil underground
6. Number one petroleum state
10. Petroleum as it comes from wells
11. Plant that distills petroleum
12. Most oil comes from \_\_\_\_ countries
13. We \_\_\_\_ wells to get to petroleum

# PROPANE



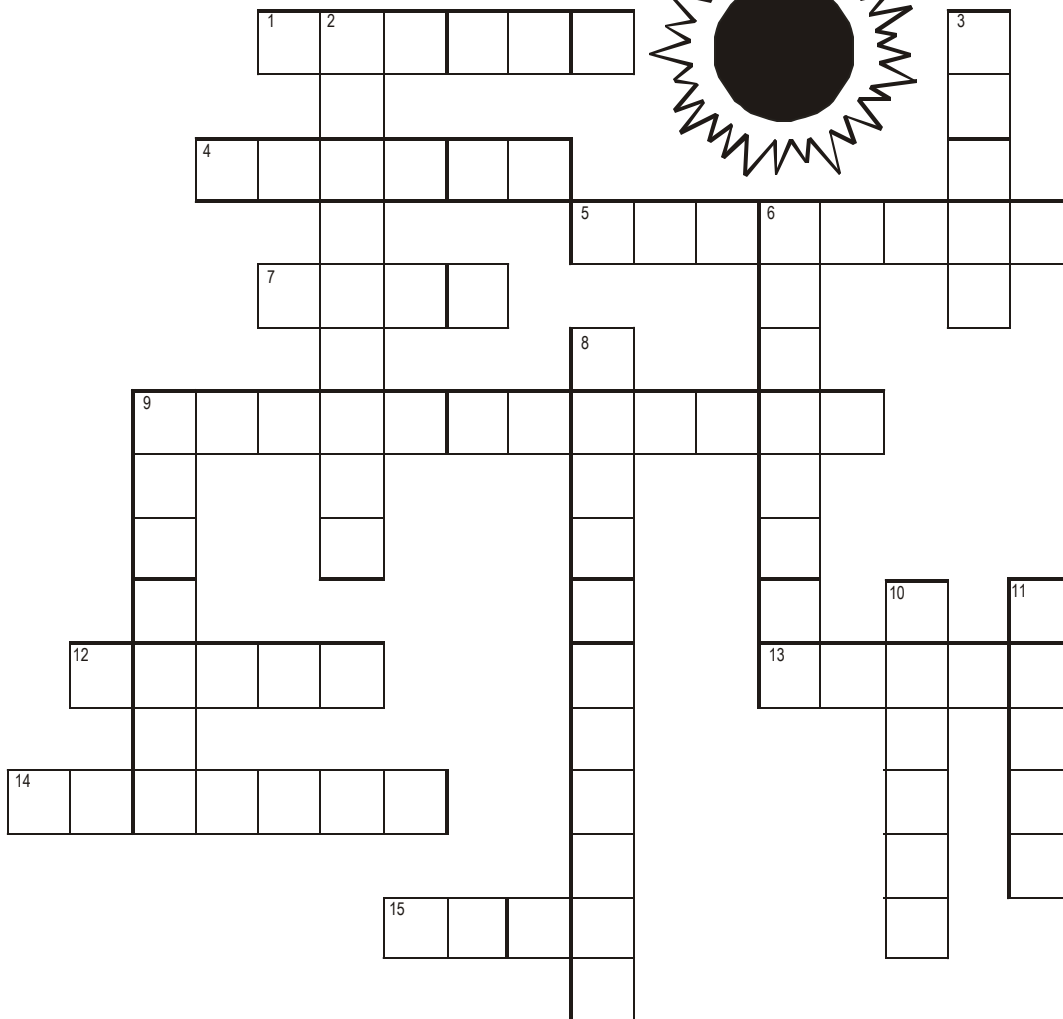
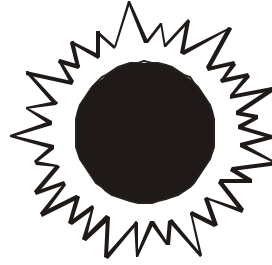
## ACROSS

1. Formed from ancient plants and animals
3. Propane state under pressure
5. Propane warehouse or distribution \_\_\_\_
6. Propane is distributed by \_\_\_\_
7. Propane is moved long distances by \_\_\_\_
10. Propane is used in \_\_\_\_ areas
12. Not replenishable in a short time
13. Propane is easy to transport; it's \_\_\_\_

## DOWN

1. Propane is used for heat on \_\_\_\_
2. Propane is an LPG -- a \_\_\_\_ petroleum gas
4. Local propane dealers fill their trucks at a \_\_\_\_
6. Propane is stored at home in \_\_\_\_
7. Propane is a liquid under \_\_\_\_
8. People use propane in \_\_\_\_
9. Propane in its natural state
11. Propane can be stored in an underground \_\_\_\_

# SOLAR



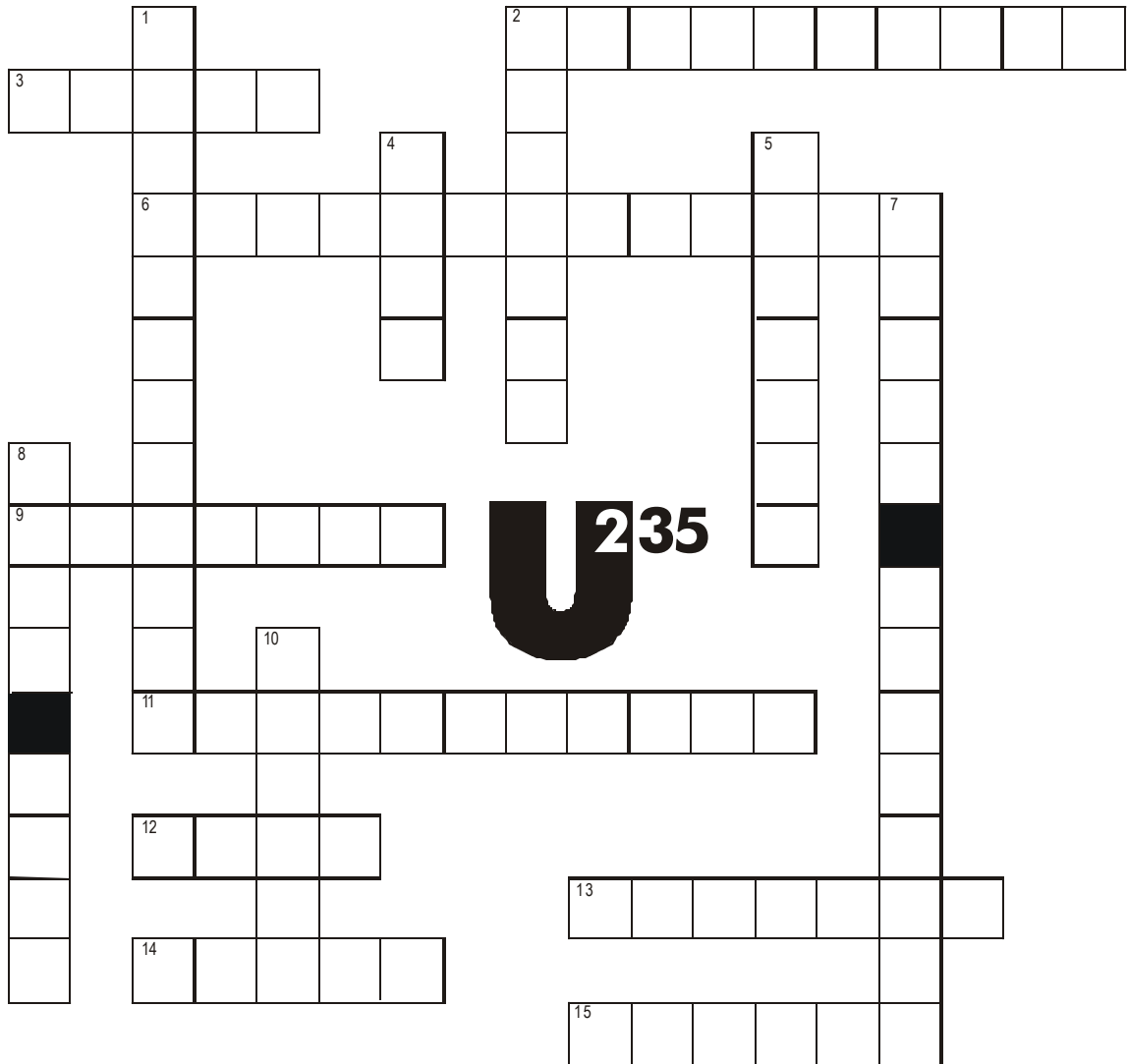
## ACROSS

1. An \_\_\_\_ solar house has special equipment
4. Element produced in solar fusion
5. Element transformed in solar fusion
9. Solar cell
12. Visible radiant energy
13. Direction PV cells should face in USA
14. Form of energy meaning heat
15. Measure of electricity

## DOWN

2. Solar \_\_\_\_ gathers radiant energy and turns it into heat
3. Solar collector can heat \_\_\_\_ for showers
6. The sun \_\_\_\_ or sends out energy all the time
8. PV cells convert radiant energy into \_\_\_\_
9. Solar houses without special equipment to collect sunlight
10. Combining nuclei of atoms
11. Greek word for light

# URANIUM



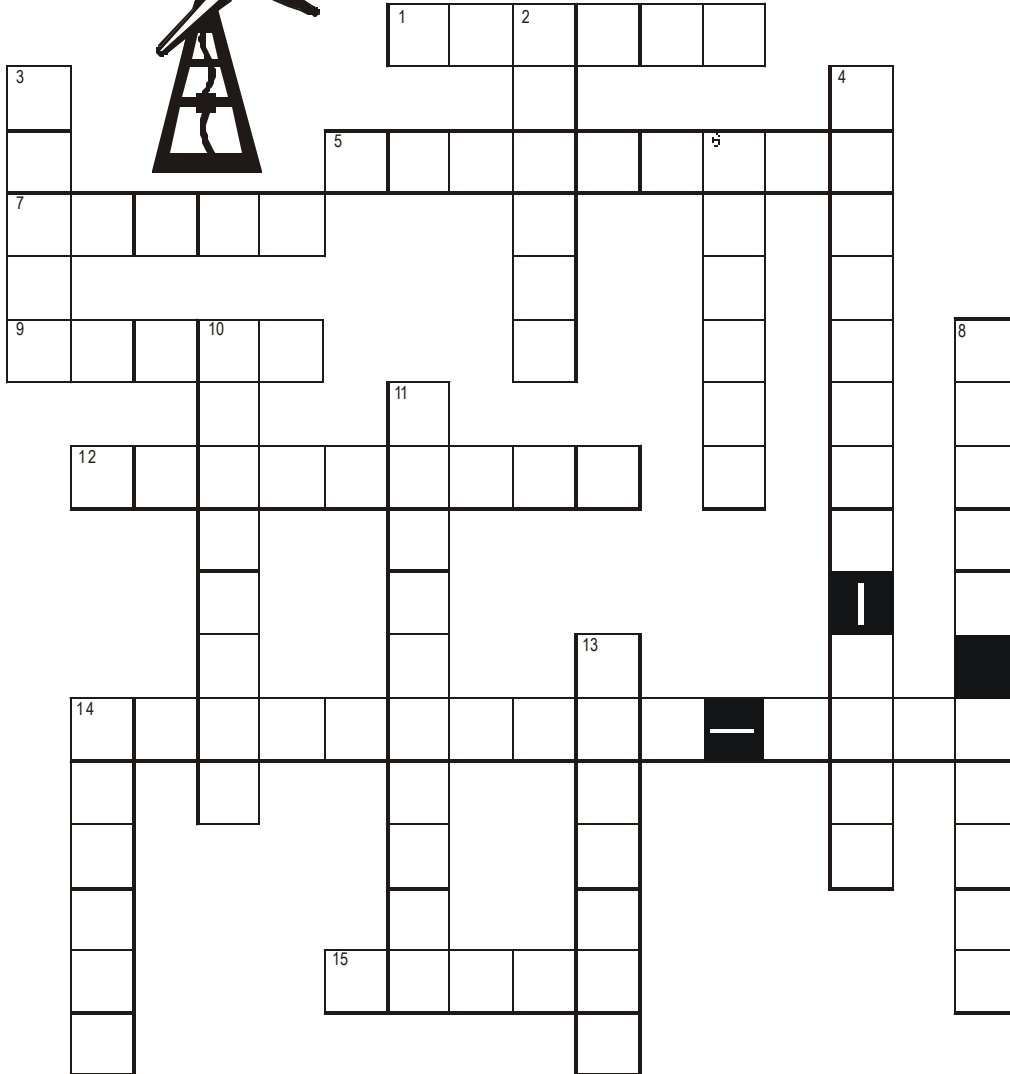
## ACROSS

2. Storage facility for nuclear waste
3. Smallest units of elements
6. Process of producing radiation
9. Metallic element used in nuclear power plants
11. Product of nuclear power plant
12. Fission produces this form of energy
13. Energy stored in nuclei of atoms
14. A \_\_\_\_ reaction keeps going on its own once started
15. Combining nuclei of atoms

## DOWN

1. Can't make more uranium; it's \_\_\_\_.
2. Part of power plant where fission takes place
4. Center of a reactor
5. Splitting of nuclei of atoms
7. Area in U.S. where repository is planned
8. Containers for uranium pellets
10. State where nuclear waste may be stored

# WIND



## ACROSS

1. Average amount of time wind machines are working
5. Replenished in a short time
7. Energy source that produces wind
8. Wind machine blade \_\_\_\_ the speed of the wind
12. Turns motion into electricity
14. Wind machine with blades
15. Air over \_\_\_\_ heats up more slowly

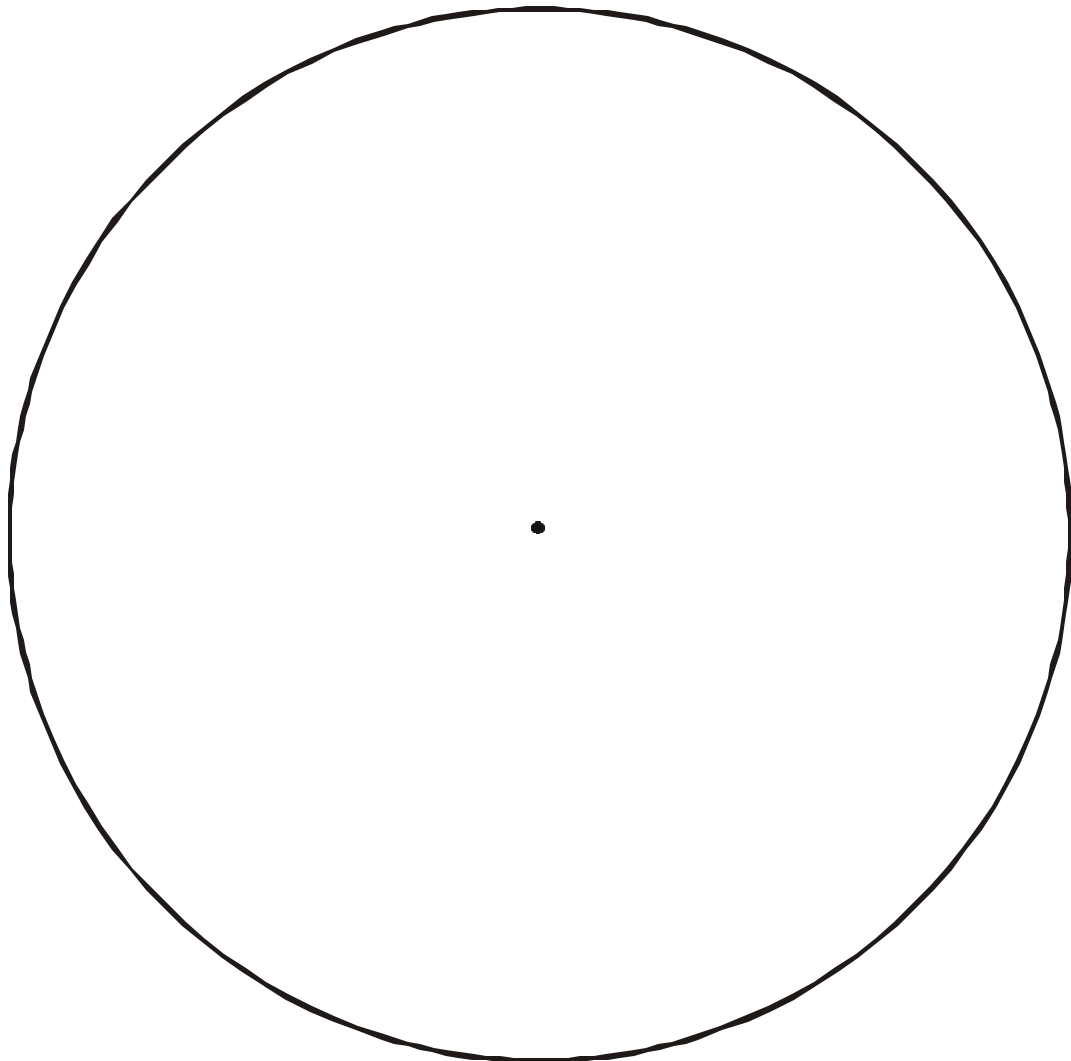
## DOWN

2. Wind is caused by \_\_\_\_ heating of the earth's surface
3. Warm air \_\_\_\_.
4. Wind machine with blades like egg-beaters
6. Part of wind machine that captures the wind energy
9. Group of wind machines
10. Transfers motion to the generator
11. Number one wind energy state
13. This stores electricity until needed
14. Wind increases with \_\_\_\_ (elevation)

# RENEWABLES AND NONRENEWABLES
















Convert the quads into percentages and make a pie chart showing how much of the energy the U.S. consumed in 2000 came from renewable sources and how much came from nonrenewable sources (Q = quad or quadrillion Btu).

PETROLEUM	36.9 Q	=	_____	%
COAL	21.7 Q	=	_____	%
NATURAL GAS	21.3 Q	=	_____	%
URANIUM	7.7 Q	=	_____	%
BIOMASS	3.5 Q	=	_____	%
HYDROPOWER	3.4 Q	=	_____	%
PROPANE	1.7 Q	=	_____	%
GEOTHERMAL, SOLAR, WIND	0.5 Q	=	_____	%



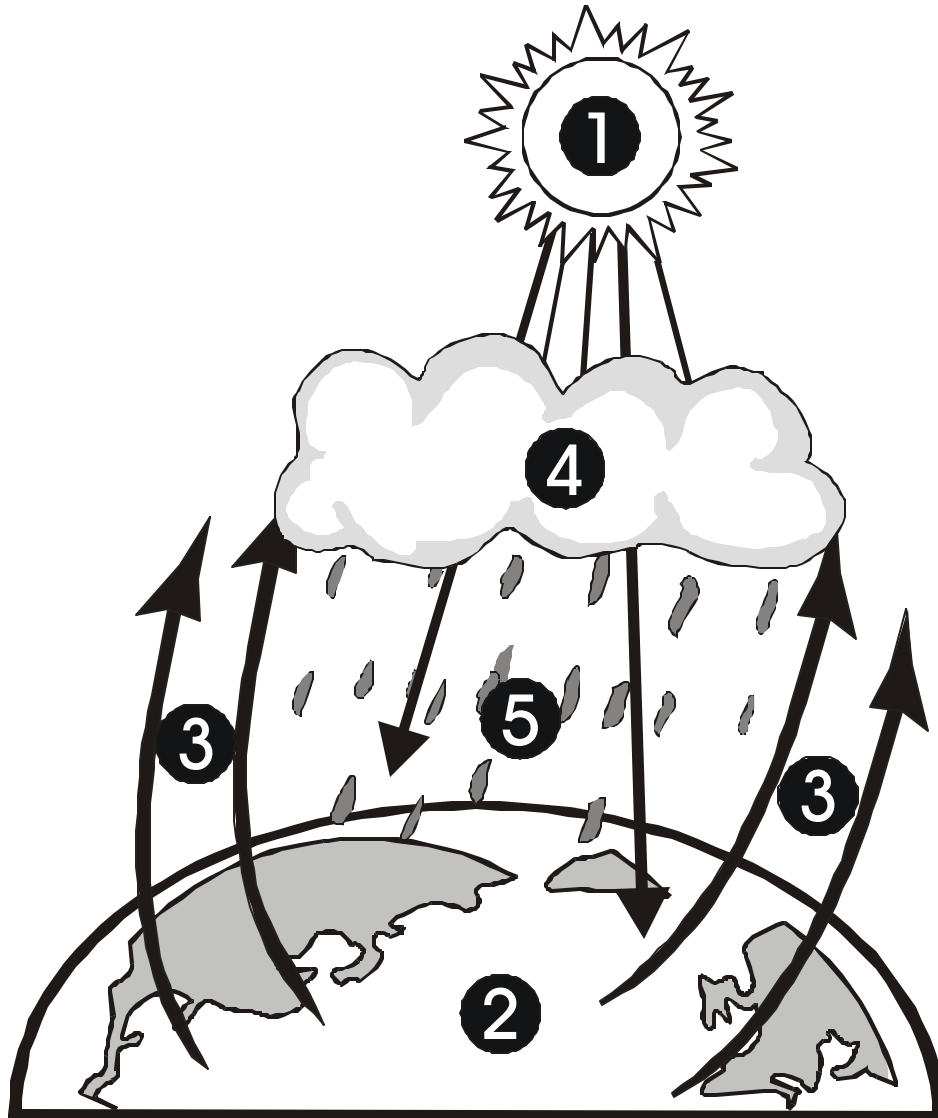
# HOW WE USE OUR ENERGY SOURCES

Number the main uses of each energy source from 1 to 5, with 1 as the most important use.  
Some sources may be used in only one or two ways.

	 TRANSPORTATION	 MANUFACTURING	 HEATING/COOLING	 LIGHTING	 ELECTRICITY
					
					
					
					
					
					
					
					
					
					

# The Water Cycle

Label and describe the water cycle in the space below following the numbers on the diagram.



- 1.
- 2.
- 3.
- 4.
- 5.

# ELECTRICITY

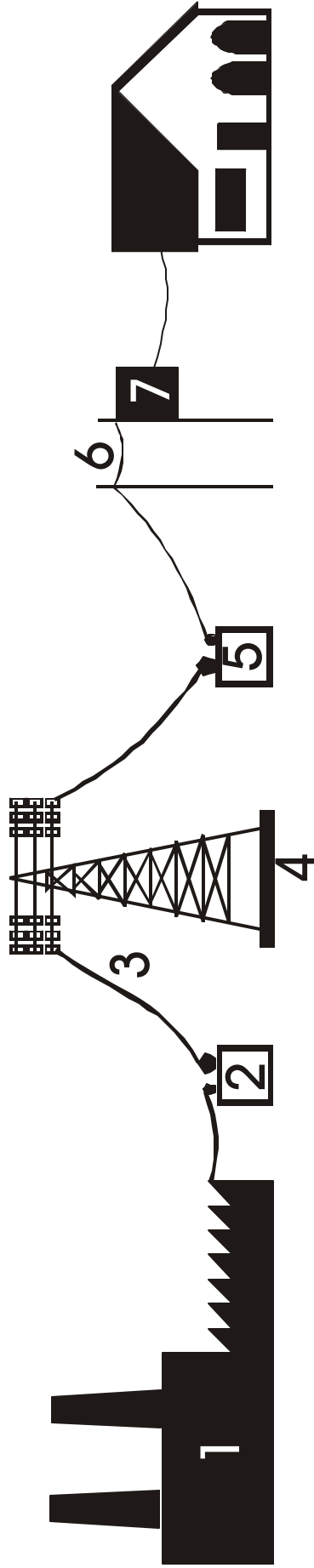
Write the correct word for each definition in the blank space.

1. A substance in which all atoms are identical. \_\_\_\_\_
2. The center of an atom. \_\_\_\_\_
3. The negatively-charged particle of an atom. \_\_\_\_\_
4. The positively-charged particle of an atom. \_\_\_\_\_
5. The particle in the nucleus an atom with no charge. \_\_\_\_\_
6. The smallest part of an element that retains the element's characteristics. \_\_\_\_\_
7. An electrical force within an atomic particle. \_\_\_\_\_
8. The areas around the nucleus where electrons are located. \_\_\_\_\_
9. The force field created between the poles of a magnet. \_\_\_\_\_
10. Electrons that jump from object to object. \_\_\_\_\_
11. A device that does work in an electrical circuit. \_\_\_\_\_
12. A path through which electricity travels. \_\_\_\_\_
13. How like charges or poles of a magnet respond. \_\_\_\_\_
14. How opposite charges or magnetic poles respond. \_\_\_\_\_
15. An object in which the electrons at one end spin in one direction and the electrons at the other end spin in an opposite direction. \_\_\_\_\_
16. A device that converts energy into a spinning motion. \_\_\_\_\_
17. A device with magnets and coils of wire that produces electricity. \_\_\_\_\_
18. A device that produces electricity through a chemical reaction. \_\_\_\_\_

nucleus	atom	element	proton	neutron	electron	shells	static
load	turbine	generator	magnetic field	magnet	circuit	battery	
attract	repel	charge					

# TRANSPORTING ELECTRICITY

Explain what each of the components numbered below does to get electricity from the generator to the consumer.



1. Power plant -
2. Step-up transformer -
3. Transmission line -
4. Power tower -
5. Step-down transformer -
6. Distribution line -
7. Neighborhood transformer -

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[www.NEED.org](http://www.NEED.org)**

