

**ACTIVITY 14.1**

**UNIT WORD SEARCH**

acid rain  
atmosphere  
biofuel  
biomass  
energy

environment  
fossil fuel  
greenhouse effect  
hunting  
hydropower

national park  
non-renewable  
ozone layer  
pollution  
radon

renewable  
solar power  
stewardship  
turbines  
wildlife

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

**ACTIVITY 14.2 RESOURCE LOCATOR**

**Student Materials**

Pencil  
Paper

In groups of 3 or 4, choose a natural resource to research. Divide the questions below among group members. Record the answers to your questions. Using the information gathered, develop a presentation about your resource.

**Name of Resource** \_\_\_\_\_

<b>Question</b>	<b>Person Responsible</b>
1. Where is the resource found in the environment?	
2. Is this a renewable or non-renewable resource? Explain why or why not.	
3. How do humans use this resource?	
4. How does this resource relate to agriculture? Is it important to agriculture?	
5. Is this resource being endangered by human use? How? What is the current availability of this resource?	
6. How does this resource relate to the other resources?	
7. What are 10 careers that would relate to this resource?	
8. What are some products that come from this resource that are used by humans?	
9. How can people better manage this resource?	

Question # \_\_\_\_\_

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Question # \_\_\_\_\_

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Question # \_\_\_\_\_

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**ACTIVITY 14.3**      **AFFECTS OF ACID RAIN****Student Materials**

3 bean plants per group

Water

Vinegar

Acid rain also called acid precipitation or acid deposition, is precipitation containing harmful amounts of nitric and sulfuric acids formed primarily by nitrogen oxides and sulfur oxides released into the atmosphere when fossil fuels are burned. It can be wet precipitation (rain, snow, or fog) or dry precipitation (absorbed gaseous and particulate matter, aerosol particles or dust). Acid rain has a pH below 5.6. Normal rain has a pH of about 5.6, which is slightly acidic. The term pH is a measure of acidity or alkalinity and ranges from 0 to 14. A pH measurement of 7 is regarded as neutral. Measurements below 7 indicate increased acidity, while those above indicate increased alkalinity.

**I. State the Problem or Question**

Is acid rain harmful to farmers who have fields of growing produce?

**II. Hypothesis**

What is your prediction for what will happen? \_\_\_\_\_

\_\_\_\_\_

**III. Experiment**

1. Set up a bean plant garden with three containers, each container having one bean plant each.
2. Prepare 3 solutions. One cup of water, 1 cup of vinegar, and 1cup mixed water and vinegar (1/2 water and 1/2 vinegar). Predict how the plants will be affected by each solution.
3. Water plants every day with 1/8 to 1/4 cup of a solution: one plant with tap water, one plant with straight vinegar, and one plant with the vinegar-water mixture.
4. Observe plants daily to see what happens to each plant. Record your observations in the table provided.

**IV. Observations**

	<b>Water</b>	<b>Vinegar</b>	<b>1/2 Water, 1/2 Vinegar</b>
Day 1			
Day 3			
Day 5			
Day 7			

**V. Interpret the Data**

Does the data support or defend your hypothesis? \_\_\_\_\_

\_\_\_\_\_

**VI. Draw Conclusions**

Justify the data collected with concluding statements about what has been learned. Discuss any problems or concerns. Use other studies to support the conclusion. Give alternative ideas for testing your hypothesis.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**ACTIVITY 14.4**

# WILL YOUR CAR RUN ON GRASS?

**Student Materials**

- |                       |            |
|-----------------------|------------|
| 1/2 c hot water       | flour      |
| baking yeast          | 4 balloons |
| 4 clear water bottles | salt       |
| funnel                | sugar      |
| stirrers              | vinegar    |
| measuring spoons      |            |

**Background**

Oklahoma State University, in cooperation with the Noble Foundation in Ardmore, is working on an alternative to corn for the production of biofuels – switchgrass. Switchgrass is a native prairie grass that grows all over Oklahoma. Unlike corn, the current varieties of switchgrass grow without tillage and planting. Switchgrass is a perennial and requires less water and fertilizer than crops such as corn. Switchgrass can produce between 300 and 700 gallons of ethanol per acre. In addition, more net energy is gained from switchgrass than from corn. Ethanol from corn yields 34 percent more energy than it takes to grow and process the corn into biofuel. Ethanol from switchgrass nets over five times more than that amount.

You may be wondering how researchers determine if a plant is capable of producing biofuel. One way to make biofuel is to ferment plants. Using processes similar to those used to make beer and wine, yeasts can be used to ferment starches in grain kernels (usually corn) to ethanol.

**In this activity, you will experiment to see which substance, salt, sugar or vinegar, will help the fermentation process the most. Using the steps of the scientific method, carry out the experiment as described in the procedure.**

**I. State the Problem or Question**

What do you want to learn or find out? \_\_\_\_\_  
\_\_\_\_\_

**II. Hypothesis**

What is your prediction for what will happen? \_\_\_\_\_  
\_\_\_\_\_



**III. Experiment**

1. Number your bottles 1-4
2. Using the funnel, pour ½ cup of hot water into each bottle.
3. With a dry funnel, empty one packet of yeast into each bottle.
4. Stir for one minute.
5. Add 2 tsp. of flour to each bottle.
6. Stir again. Add ingredients to each bottle as follows:  
 Bottle # 1—Add 5 ml (1 tsp) of salt.  
 Bottle # 2—Add 5 ml of sugar.  
 Bottle # 3—Add 5 ml of vinegar.  
 Bottle # 4—Control. Leave as is.
7. Stir each bottle again for one minute.
8. Place a balloon over each bottle.
9. Record observations below after five, 10, and 15 minutes.
10. Predict what will happen to the solutions overnight.
11. Let the solutions sit overnight.
12. Record observations.

**IV. Observations**

	5 Minutes	10 Minutes	15 minutes	Overnight
<b>Bottle 1 Salt</b>				
<b>Bottle 2 Sugar</b>				
<b>Bottle 3 Vinegar</b>				
<b>Bottle 4 Control</b>				

**V. Interpret the Data**

Does the data support or defend your hypothesis? \_\_\_\_\_

\_\_\_\_\_

**VI. Draw Conclusions**

Justify the data collected with concluding statements about what has been learned. Discuss any problems or concerns. Use other studies to support the conclusion. Give alternative ideas for testing your hypothesis.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Name \_\_\_\_\_ Date \_\_\_\_\_ Hour \_\_\_\_\_

**ACTIVITY 14.5**

**WILDLIFE IDENTIFICATION**

**Student Materials**

Pencil

**Select a wildlife animal to research. Using the Internet or books from the library, find the information on your particular species. Use this information to create an informational poster about the wildlife species. Include at least one photo of your animal on the poster.**

Name of the animal \_\_\_\_\_

Describe the animal's habitat. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What does the animal eat? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

In what areas of the world does the animal live? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Are there any government regulations (laws) concerning this animal's treatment? If so, list the laws.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





List 2 interesting facts about the animal that you learned through your research.

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References (list the books or Internet sites used to find information)

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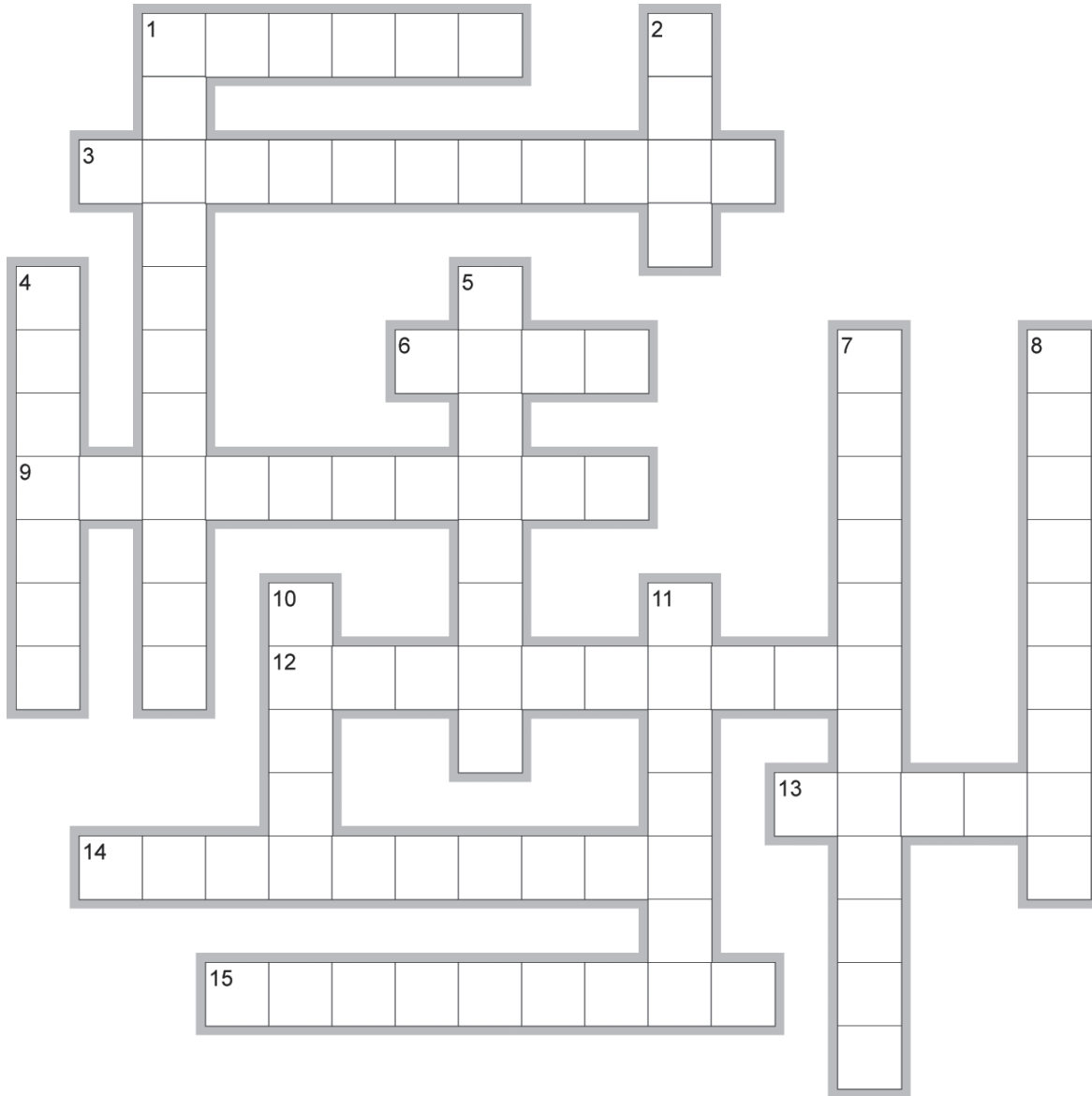
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**ACTIVITY 14.6**

**UNIT REVIEW CROSSWORD**



EclipseCrossword.com

**Across**

1. Environmental Protection \_\_\_\_\_
3. wise use of resources
6. produced by turbines
9. Laws protect wildlife from \_\_\_\_\_.
12. protects from harmful radiation
13. rock gas
14. water energy
15. replaced in one lifetime

**Down**

1. other than fossil fuel
2. base rain opposite
4. reason for hunting wildlife
5. All \_\_\_\_\_ have the right to use public lands.
7. national park purpose
8. reduces pollution; aluminum, paper, glass
10. power by the sun
11. land, water, air, humans; \_\_\_\_\_ resources