

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 _____

Question	Person Responsible
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 # ____

Question # ____

Question # ____

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

	Water	Vinegar	1/2 Water, 1/2 Vinegar
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
Bottle 1 Salt				
Bottle 2 Sugar				
Bottle 3 Vinegar				
Bottle 4 Control				

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.



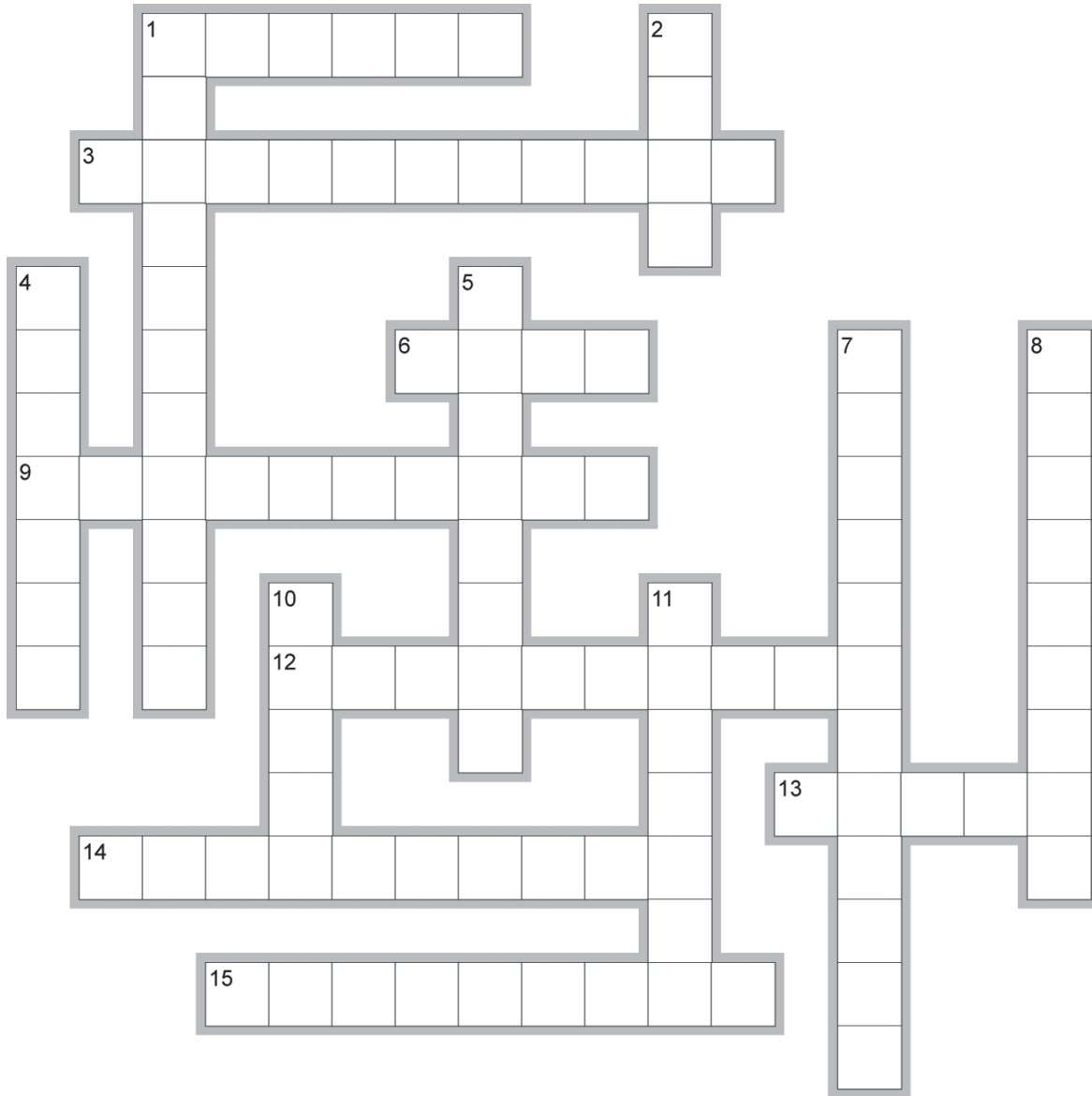
List 2 interesting facts about the animal that you learned through your research.

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



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