Summer 2013 Issue

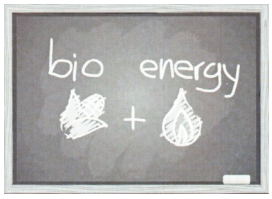
Ohio 4-H Cloverbud Connections

For 4-H Cloverbud Volunteers working with grades K—2

Bioenergy Education for Kids (K-5): Be Part of It Now

A new curriculum has been created to strengthen our 4-H STEM (science, technology, engineering, and math) effort. This new web-based resource will help our next generation of leaders develop an awareness and appreciation for a sustainable energy future. It is leader-directed curriculum, targeting 4-H Cloverbuds and youth through 5th grade.

There are three curriculum pieces that make up the bioenergy education materials: 1) bioenergy sources, 2) bioenergy conversion, and 3) bioproducts. Each curriculum piece contains about nine educational activities. Some of the activities include: "Our Sun: The Ultimate Bioenergy Generator," "Don't Pass Gas: Convert that Biomass," and "Fueling the Future."



Bioenergy is a renewable source of energy that is produced from plants and animals. Unlike bioenergy, fossil fuels such as crude oil and coal are not renewable. Because they are created over thousands to millions of years, fossil fuels are limited. Some forms of bioenergy have been around for a long time. Examples include burning wood to create heat, using biodiesel and ethanol to fuel vehicles, and using methane gas and wood to generate electricity. More recently, other forms of bioenergy use materials called "biomass," such as sugar cane, grasses, straw, soybeans, and corn. Biomass is any plant or animal matter that uses sunlight to store energy. Plants do this through photosynthesis. Animal waste, which is comprised mainly of plant material, is also biomass.

Are you looking for an educational activity for your Cloverbuds? Check out the "Biofuel Milestones" activity in the Click-it, Print-it, Do-it activity page. Included are all the pages you will need to know when and how biofuels have changed over the years!

This curriculum helps children understand where bioenergy comes from (bioenergy sources), how bioenergy is changed (bioenergy conversion) into something more useable, and what the resulting products (bioproducts) are.

You can access the curriculum through this web link: http://www.ohio4h.org/ohio-4-h-cloverbud-connections/cloverbud-volunteer-resources/cloverbud-resources#Bioenergy Ed Curriculum. Funding for this effort was through a Northeast Regional Sun Grant Initiative, with a grant from the U.S. Department of Transportation: US DOT Assistance #DTOS59-07-G-00052.

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THE OHIO STATE UNIVERSITY EXTENSION

Wind Power

Now more than ever, we are challenged to balance the economic, environmental, and social impacts of energy development. As a result, rural communities across America are emerging as dominant producers of renewable energy sources such as wind, solar, and biomass. Evidence of this transition can be found in northwest Ohio, in the development of the Timber Road and Blue Creek Wind Farms. Combined the wind farms consist of 207 wind turbines producing roughly 450 megawatts of electricity, which is enough energy to power 107,000 homes. There is also a significant economic impact, as the wind farms generate over 4 million annually in local tax revenue, make lease payments to landowners, and create new employment opportunities. For additional information on Ohio's first wind farms, go to: http://www.youtube.com/watch?v=oPTMplsWl7c&feature=youtu.be to view an OSU Extension YouTube video.

Now is the time to engage our youth in renewable energy education, teaching them the need to balance energy development and the environment. As a Community Development Educator, my typical audience consists of elected and appointed officials and local community leaders. Therefore, many of my energy programs are not tailored to a youth based audience. However, as a father, I am constantly discussing energy and energy conservation with my 4-year-old daughter and am amazed at how interested and engaged she is in the topic.

In my experience, two principles that encourage the energy education process include 1) seeing is believing and 2) crayons make every lesson from dad a little more bearable. As a first step, I encourage you to take a field trip to the wind farms in northwest Ohio. During the field trip, discuss various forms of energy and how they are converted into electricity to support our daily activities. To guide this discussion, the U.S. Department of Energy teaching outline titled Fun with the Sun -- Teacher's Activity Guide, found at: http://www1.eere.energy.gov/education/pdfs/lesson299.pdf offers some great (K-2) lesson plans on energy basics. Starting on page 55, the guide explores wind energy as a renewable energy source providing educators with a brief overview of background knowledge, learning objectives, discussion strategies, and probing questions such as:

- How do we use energy?
- What do you think you know about the wind?
- What makes the wind blow?
- How do you know the wind is blowing?

As my daughter and I discussed wind energy, we use crayons to take notes and illustrate our conversation. Following the activity guide on page 58, we also printed off the wind wheel template and constructed a miniature windmill to experiment with wind in the backyard. It wasn't long before my daughter was telling my wife "mommy did you know the sun makes wind energy, and, windmills convert it into usable electricity that powers our lights?"

I encourage you to introduce wind energy to children at an early age. Understanding the basics of energy and the environment is a critical foundation for a sustainable future. Please feel free to contact me if you would like assistance in organizing a field trip, want to explore additional ideas for youth energy education, or simply want to discuss energy development in Ohio.

Eric Romich, Field Specialist, Energy Development, Ohio State University Extension.

Subsurface Energy

We keep hearing lots of information about the gas and oil business in the area. Here is some information and activities you can use with your Cloverbud members to give them an overview of what is going on around us.

Oil and Gas as Energy

Americans use a lot of energy. In fact, the United States is the second largest consumer of energy in the world. Energy can come from coal, the sun, wind, and other places, but most energy in the U.S. comes from fossil fuels.

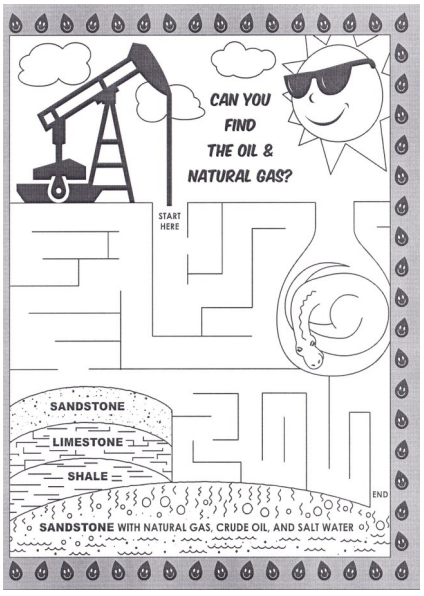
Fossil fuels are formed from animal and plant remains deposited millions of years ago in the earth. The chemicals they contain, **hydrogen** and **carbon**, form petroleum, coal, or natural gas. These are typically burned to provide energy.

Most of the nation's natural gas comes from what have been called **conventional** sources. Conventional gas often comes from underground sandstone formations in the Gulf of Mexico and the western and southwestern U.S. However, in recent years more gas comes from **unconventional** sources, including shale gas. The natural gas in shale deposits formed 350 million years ago.

Shale is a very fine-grained **sedimentary** rock and is easily breakable into thin, parallel layers. It is a very soft rock, but it does not fall apart when it becomes wet. Shale can contain natural gas, usually when two thick, black shale deposits "sandwich" a thinner area of shale. Because of some of the shale's properties, the extraction of natural gas from shale formations is more difficult and perhaps more expensive than extraction of conventional natural gas. Ohio has two such shale deposits: the Marcellus and Utica shales. Other deposits that may have economically important oil and gas resources may be tapped in the future.

For fun activities to do with your kids, go to:

http://oogeep.org/teachers-students/educational-materials/



Picture courtesy of: Ohio Oil and Gas Energy Program. www.oogeep.org

Jane Keyser, Extension Educator, 4-H Youth Development, OSU Extension, Belmont County, Ohio, Buckeye Hills EERA.

Have Fun in the Sun

Everyone loves a sunny day, so it is the perfect time of year to teach children about solar energy. The sun provides energy in the form of light which powers life on the surface of our planet. Depending on the season and location on earth, it can provide up to 1400W of energy. That is enough energy to power 14 100W incandescent light bulbs!

There are many simple experiments that 4-H volunteers can facilitate to help Cloverbuds learn about solar energy. The following experiment will introduce the effect of color on solar energy absorption. Gather the following…

Materials:
Three thermometers, black piece of paper, white piece of paper, a few rocks to use as weights, a pen, chart (see below), and a bright sunny day!

Begin your meeting outside. Point out how bright and warm the sun is. Explain that you're going to do an experiment to find out if the color of materials affects energy absorption.

Instructions:
1) Place thermometers in direct sunlight on a sidewalk, two feet apart.
2) Cover one thermometer with black paper and one with white paper. Leave the third thermometer uncovered.
3) Place rocks on the paper as weights.

Ask the Cloverbuds what they think will happen. Which thermometer will have the highest and lowest temperature, or, will they be equal? Tell them that what they think will happen is called a hypothesis. Record their hypothesis on the chart. Then, conduct another part of your meeting.

Later, return to the experiment. Record the temperature on each thermometer. Ask and answer the following questions.

Questions:
* What was discovered? The thermometer covered in black should have the highest temperature, and, the thermometer coved in white should have the lowest temperature.
* How do the findings compare to the Cloverbuds' hypothesis?
* How can these findings be used?
* Does the color of clothing worn on a sunny day make a difference? Yes, light colored clothes are cooler.
* Does it matter what color your dog house is painted? Why? If your dog house is painted dark red and has a black roof, will your dog be warmer or cooler during the winter?
* What could be done to keep the dog cooler during the summer? Move the dog house to a shaded area.

Bonus:
If time permits, repeat the experiment in the shade and compare your findings.

Additional fun solar energy lessons are available through the Florida Solar Energy Center at http://www.fsec.ucf.edu/en/education/k-12/curricula/sm1/index.htm.

A coloring book on solar energy is available through the Texas Solar Energy Society. It is available at http://www.builditsolar.com/Projects/Educational/coloring_book-1.pdf and may be reproduced for educational purposes.

Source: The thermometer activity is adapted from "Energy from the Sun," an activity from the U.S. Energy Information Administration available at http://www.eia.gov/kids/resources/teachers/pdfs/Activitybook_web.pdf.
(Permission to use granted by U.S. Energy Information Administration)

Thermometer	Record the number of children who expect each finding:			Actual Temperature
	Lower Temperature	Higher Temperature	Equal Temperature	
Covered in black				
Uncovered				
Covered in white				

Joyce Shriner, Extension Educator
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Campus Connections

Hello again! Great to make this Cloverbud Connection with you!

Did you know we have eight critical elements to help make the 4-H Cloverbud Program successful? Now might be a good time to check out these elements. We use them to help reach our goal of creating an environment for life skills to be achieved and enhanced.

1. Positive Relationships with Caring Adults (YOU) by:
* children learning and developing in an adult leader-directed environment
* the volunteer leaders creating a positive learning environment that is caring, supportive and fun

2. An Inclusive Environment by:
* using cooperative-learning techniques as the children work on activities together
* engaging the children in curriculum that are noncompetitive without setting up categories or classes

3. An Opportunity for Mastery/Competence by:
* allowing the children to be creative across eight different subject areas
* utilizing the experiential learning cycle through the activities as children experience, share, process, and generalize

4. An Opportunity to Value and Practice Service to Others by:
* fostering the appreciation of community service through 4-H Cloverbud activities
* cleaning-up after activities and children helping each other

5. An Emotionally and Physically Safe Environment by:
* meeting the needs of children at where they are emotionally, physically, socially, and cognitively
* taking special considerations to ensure the safety of 4-H Cloverbud children with low risk and safe activities

6. An Opportunity for Self-Determination by:
* conducting success-oriented activities to help children gain confidence
* using noncompetitive activities to foster intrinsic motivation

7. An Opportunity for Engagement of Learning by:
* employing fun, positive experiences for children
* providing numerous subject areas that interest the participants

8. An Opportunity to See Oneself as an Active Participant in the Future by:
* giving the children choices in upcoming activities
* exploring a variety of future career options

Keep in mind that high quality, positive youth development programs do not happen by accident. Let your 4-H Cloverbud leaders know that they play an important role in creating an environment for life skills to be achieved and enhanced.

Thanks for your commitment to the 4-H Cloverbud program as we enhance the healthy development of children throughout the state!

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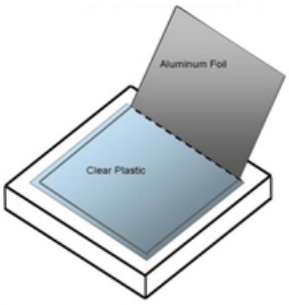
Pizza Box Solar Oven

Summer brings lots of sunshine and the joy of cooking outside. Usually we think about cooking over a fire or on a grill, but have you ever thought about cooking with a solar oven? Try making a pizza box solar oven to bake cookies or S'mores for your next Cloverbud meeting. It is easy to make a solar oven from a recycled pizza box, black construction paper, aluminum foil, clear plastic wrap, tape, scissors and a wooden dowel or straw.



A pizza box solar oven can reach temperatures of 275 degrees, hot enough to cook food! You should expect cooking times to take about twice as long as a conventional oven. You should also plan about 30 minutes to preheat your solar oven.

Resources to build a solar oven:
http://www.al-solar.org/newsletters/2009-03/Making%20a%20Pizza%20Box%20Solar%20Oven.pdf
(Permission to use granted by the Alabama Solar Association at www.AL-Solar.org)

http://www1.eere.energy.gov/education/pdfs/lesson298.pdf
(Permission to use granted by The Office of Energy Efficiency and renewable Energy, 2010)

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4-H Cloverbuds
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