

FOOD FUEL FOR THOUGHT

ood is the energy source for our bodies. Food provides us with "fuel" to live, energy to work and play and nutrients to stay healthy. So what kind of fuel is best for our bodies? Grains, vegetables, fruits, milk, meat and beans are all good choices that provide healthy nutrients. But eating healthy foods is not enough. A person needs to balance food intake with physical activity - walking, swimming, bicycling or dancing. Wow! How do you make the right choices? Take a hike along the MyPyramid Expedition a nutrition game found in the middle of this section - and follow the trail to Healthy Peak!

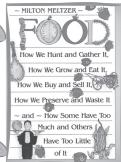
Once you investigate food as an energy source for your body, think about the fuels that provide energy sources for the world fueling our cars, running our industries or heating our homes. Could agricultural biobased fuels be the answer to our country's dependence on nonrenewable fuel sources such as coal and oil? Does our future depend on using corn, soybeans, forestry byproducts, waste oils or even alfalfa as energy sources?

The answers to all of these questions are explored throughout this Deseret Morning News Newspapers in Education and Utah State University's Agriculture in the Classroom issue on "Food and Fuel for Thought." We hope people of all ages will have fun trekking, investigating and exploring!

FUEL your mind



Just as food is critical for our bodies and gasoline is important for our cars, books are a key ingredient in keeping our minds healthy! The books featured on this page will help you learn more about nutrition, foods around the world, gardening and food processing. Fill 'er up!



I Will Never NOT EVER Eat a Tomato

Lola is a very fussy eater. One day after rattling off her long list of despised foods including carrots and peas – she ends with the loud announcement, "And I absolutely will never not ever eat a tomato." Not convinced, Lola's older sister, Charlie, has an idea. She tells Lola that the orange things on the table are not carrots but "orange twiglets from Jupiter" and peas are in fact "green drops from Greenland." Suddenly these foods seem appealing to Lola. And in the end, might she even eat a tomato?

Author: Lauren Child ISBN: 0763621803

Food: How We Hunt and Gather It. How We Grow and Eat It,

How We Buy and Sell It, How We Preserve and Waste It – and – How Some Have Too Much and Others Have Too Little of It

Have you ever wondered where your food comes from or why it costs what it does? Will we always have enough food to eat? This book is packed full of interesting facts, including how chocolate and pizza came to America and how chickens and hogs are massproduced. It also provides information about how much food people eat and how many people the Earth can support.

Author: Milton Meltzer ISBN: 0-7613-0354-5



Food

Food is essential for life. We need to eat to stay alive, but food is also an important part of how we celebrate our culture. This book visually shows why different foods are popular in different parts of the world due to climate, cooking methods and religious practices.

Author: Fiona MacDonald ISBN: 0-7787-0248-0

Check your school and local library for these books. A complete description of these books and other agriculture books can be found in the literature section of the Agriculture in the Classroom Web site at www.agclassroom.org/ut.



Each of the eight exciting chapters in this handbook contains fun activities and interesting facts to help you experience the joy of making things grow. Learn about ecology, insects and horticulture and how they relate to gardening. This handbook is one of several resources in the Junior Master Gardener program for grades 2-9. Check out the other available books and resources at www.jmgkids.com.

ISBN: 0-9672990-0-4

Distributed by Texas A & M Press



A rainy-day errand introduces Carrie to many different kinds of bread, including chapatis, challah and pupusas. Use the recipes provided to bake a variety of interesting breads.

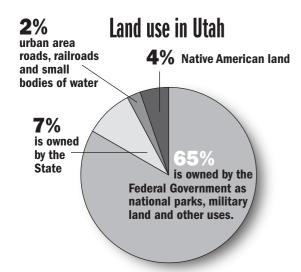
Author: Norah Dooley ISBN: 087614864X





WHERE IS **UTAH'S**AGRICULTURE?

wenty-two percent of
Utah's land is used for
agriculture. Only about
2 percent of agricultural land is
cropland; the other 20 percent is
pasture or private rangeland used
for livestock grazing. Utah ranks
10th out of 50 states in rangeland
area, with about 24 million acres.
So how is the rest of the land used
or owned? Check out the pie chart
below:



Farm-gate sales or products sold directly from Utah farms (before they are processed and turned into yogurt or bread) total just more than \$1 billion. Seventy-seven percent of the state's farm receipts come from the combined total of all livestock products sold (including sheep and wool, cattle, milk, eggs and hogs).

Utah ranks second in tart cherries, sixth in sweet cherries and 21st in apple production. Utah grows barley, wheat, dry edible beans, potatoes, onions and corn. Crop production accounts for 23 percent of the cash receipts. Find more Utah agricultural statistics at www.nass.usda.gov/ut.

Feeding People: The Big Four

The world's land is home to about 380,000 kinds of plants. About 100 kinds are regularly grown and eaten as human food. But more than half of the world's food from plants comes from only four crops. Three of them are grains and one is a tuber vegetable (in other words, a root vegetable). The powerhouse producers are wheat, rice, corn and potatoes. More than one-third of the world's people use wheat as a main food and one-third use rice.

Some plants can be eaten just as they come from the field or garden. Many are processed (changed into other forms) before we use them. In processing, foods may be cooked, canned, frozen, pickled, dried, roasted, tasted, squeezed, powdered, pureed, chopped, sliced and more.

Think about foods you've seen or sampled the last few days. Which of them, raw or processed, came from the big four?

Wheat	Corn	Rice	Potatoes
	2	3	4

Feeding Animals: Forage and Fodder



Look at the Utah agricultural map on Page 4. Everything we need comes from the land to us – but not just any land. Growing regions exist all over our state, our country and world! Some of the agricultural products we use are quite different from the ones we grow here in Utah. What is the

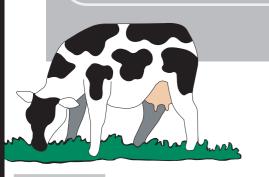
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difference between those growing regions and ours? Think about it:

Why aren't oranges grown in Utah? Why isn't corn grown in the Rocky Mountains? Why isn't rice grown in the Sahara Desert? Why aren't apples grown in Florida? Why aren't orchids raised in Antarctica?

What grows where depends on factors including soil type, rainfall, climate and terrain. For example, did you ever wonder why so many Utah farmers raise livestock? Let's look at beef and dairy cattle. Cattle need the same nutrition you do for good health – protein, vitamins, minerals, energy, food and water. Now relate this information to the land. Many areas of Utah are suitable for growing grass, corn and alfalfa – exactly what is needed to give cattle the nutrition they need.

for thought



he average U.S. **dairy cow** produces 22.5 quarts of milk each day. That's about 16,000 glasses of milk per year – enough for about 40 people. One cow can give

200,000 glasses of milk in a lifetime. Dairy cows provide us with milk and milk by-products like cheese, butter and ice cream. In addition, milk is also used to manufacture glue, paint and plastics. Cheese was first made more than 4,000 years ago in Asia.

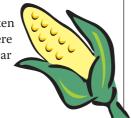
A typical, full grown Holstein cow weighs about 1,400 pounds and produces 60 pounds of milk per day. A dairy cow consumes 35 gallons of water, 20 pounds of grain and concentrated feed and 35 pounds of hay or silage (a mixture of corn and grass) in just one day. It usually takes about 20 minutes for a cow to be milked. On average, a cow is milked 2 to 3 times a day.

There are about 7,000 **cherries** on an average tart cherry tree (the number varies depending on the age of the tree, weather and growing conditions). It takes about 250 cherries to make a cherry pie, so each tree could produce enough cherries for 28 pies!

Fresh **apples** float because 25 percent of their volume is air. In the winter, apple trees need to "rest" for about 900-1,000 hours below 45 degrees Fahrenheit in order to flower and

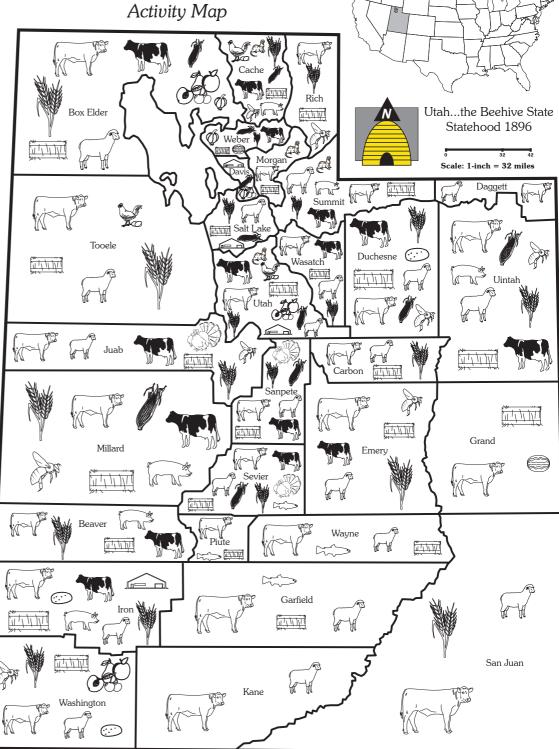
fruit properly. If you grew 100 apple trees from the seeds of one tree, they would all be different.

One bushel of **corn** will sweeten more than 400 cans of pop. There are about 600 kernels on each ear of corn.



Revised 2004

Utah Agriculture



Major Agricultural Product Legend

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	Alfalfa Hay	Apples	Beef Cattle	Bees	Chickens	Corn	Dairy	Greenhouse	Hogs	Mink	Onions	Pears	Sheep	Tart	Turkeys	Wheat &
		Ö		A STATE OF THE STA	& Eggs		TE	Production		A	Ø		W W	Cherries		Barley
Total	256,700	30 million	910,000	23,000	3.3 million	60,000	93,000	37 million	670,000	2.6 million	100 million	350	320,000	12 million	5 million	3.3 million
Production for 2001	tons	pounds	head	colonies	& 865 million	acres	cows	dollars	head	pelts	pounds	tons	head	pounds	birds	& 914,500 bushels
Top County	Millard	Utah	Box Elder	Millard	Utah	Box Elder	Cache	Utah	Beaver	Utah	Davis	Utah	Sanpete	Utah	Sanpete	Box Elder Cache

FOOD AND FUEL FOR THOUGHT

My Oylanic

Estimating some food-serving sizes

FOOD ITEM (1 SERVING)	APPROXIMATE SIZE
Meat	(3 ounces, cooked) deck of cards
Ground beef patty (1)	(3 ounces, cooked) palm of the hand
Cheese	(2 ounces) 9-volt battery
Pancakes	compact disk
Rice	cupcake wrapper
Potato	woman's fist
Fruit juice	standard Styrofoam cup
Corn bread	bar of soap
Fruit or vegetable	average ice cream scoop
Fat	stack of 4 quarters

MyPyramid lingo to know

As you look at the new MyPyramid you'll notice five food groups and a small group of fats and oils. These groups are represented by a rainbow of vertical stripes. Learn about healthy eating and the importance of physical activity by playing the MyPyramid Expedition game. You will find it useful to know the following lingo and objects:

Pyramid staircase: The staircase on the side of the pyramid means that you need to exercise and be active!

Rainbow color bands: Eat more of some foods and less of others. Food groups with wider bands mean that you should eat more of these kinds of foods. The bands are wider at the bottom and get thinner as they move toward the top. For example, apple pie would be placed in the red band near the top of the pyramid because it has a lot of added sugar and fat. An apple would be placed in the wide part at the bottom because you can eat more of those within a healthy diet.

Where Does the Food in MyPyramid Come From?

ood comes from agriculture! The farmers that produce many of the things we use every day are an important part of our food and fabric system. You might say they are the "base of the pyramid." Getting our food from farm-to-fork involves several steps and many hands. The food system has six major steps:

Utah's Own

Growing food

Harvesting & transportation

Storing food

Processing (food preparation)

Distribution of food (grocery store)

Preparing and eating of food

Everyone has been to a grocery store, but another place to go for fresh food is a farmers market. Some Utah farmers and processors (people who take what a farmer grows, like wheat or cattle, and then turn the product into bread or steak) place a Utah's Own label on their food products. For a complete list of where Utah farmers markets are



Thomas Blackburn, left, and Gino Chewning dump a box of English Peas into a crate at the Saturday farmers market in downtown Salt Lake City. (June, 2004)

located, go to the Utah Department of Agriculture and Food Web site at www.utah.gov.

As you learn about the foods you need to eat to be healthy, think about the resources such as water and soil that were used to produce the food and the people who had a hand in growing and delivering the food from farm-to-fork.

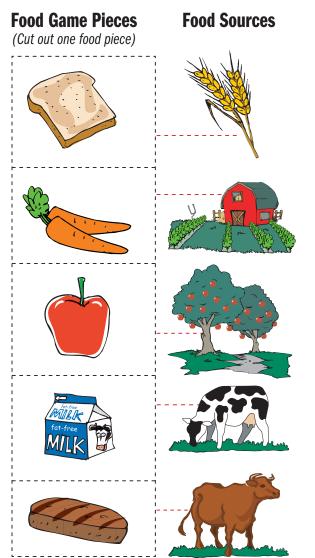
GOAL: Reach the Healthy Peak!

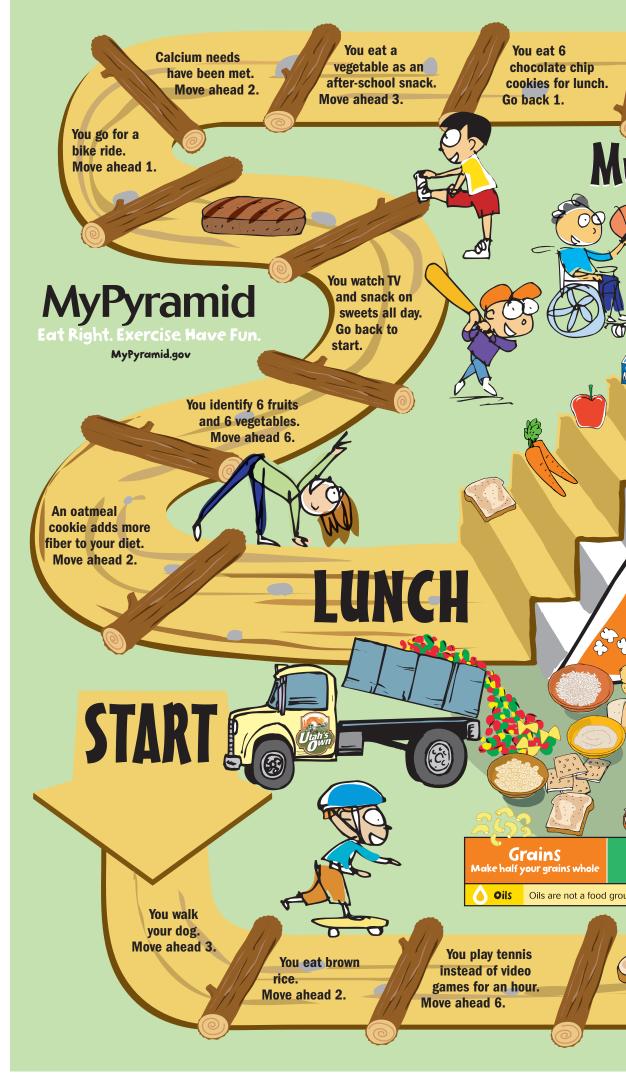
Before the game:

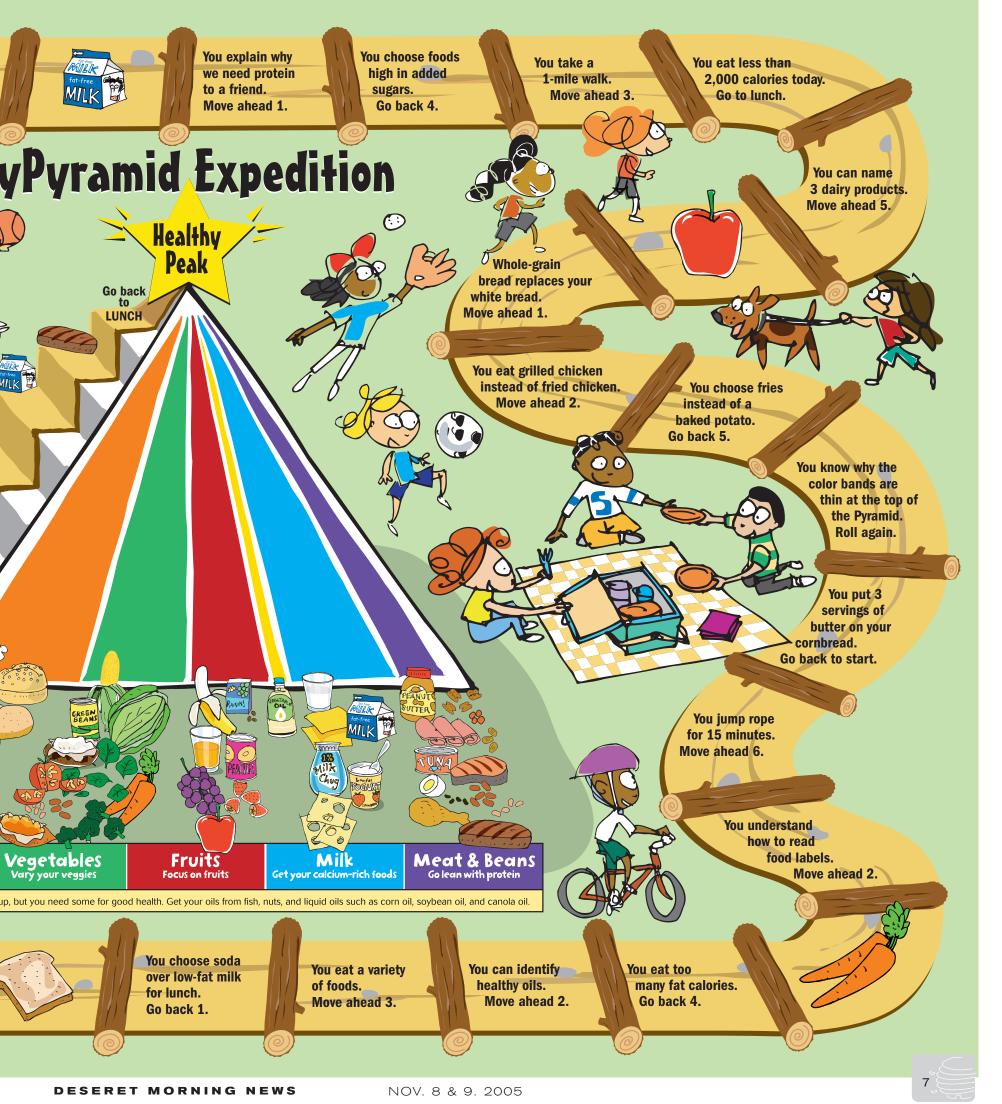
- **1.** Cut out one game piece for each player (1-5 players) from the Food Game Pieces section below.
- **2.** Find a die or create your own by numbering six small pieces of paper from 1-6, then fold up the pieces of paper. For each turn, roll the die or select a number from the cup.

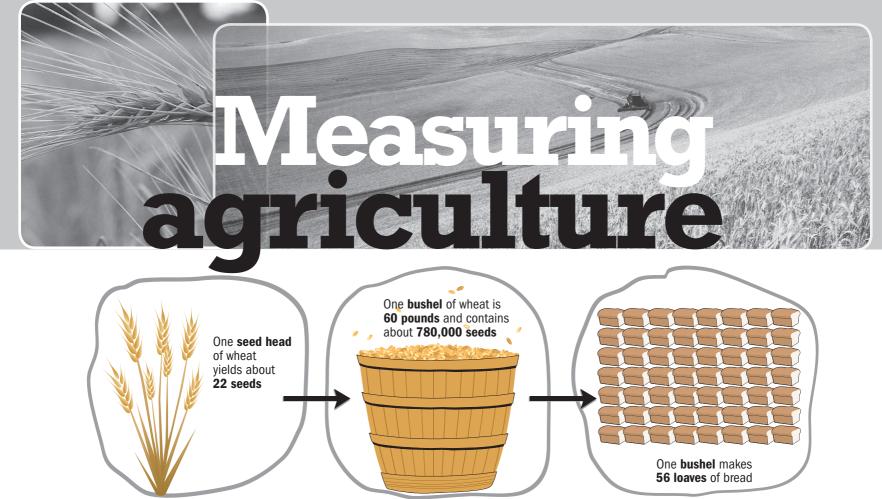
How to play:

- **1.** Each player puts a game piece on START and takes turns rolling the die, moving their game piece and following the directions on the game board.
- **2.** Some squares on the game board are food images that match your game piece. If you land on the food image that is your playing piece, roll again.
- **3.** Keep playing until each player makes it to the Healthy Peak. You don't need an exact roll to end your expedition to the Healthy Peak.









The United States Exports about 60 Million Metric Tons of Wheat

How much is in a bushel?

Apples	42-48 lbs.*
Potatoes	60 lbs.
Tomatoes	45 lbs.
White flour	42 lbs.
Shelled corn	56 lbs.
Barley	48 lbs.
Oats	32 lbs.
Wheat	60 lbs.
*lbs. is the abbreviatio	n for "pounds"

Food for thought

How many loaves of bread, cookies, bagels, tortillas or other wheat products does your family eat each week?

How many bushels of wheat do you think your family needs each year?

How many seed heads of wheat does your family need each year?

How important is it that farmers grow wheat?

Measuring Product

Familiar measurements that are used every day include weighing ourselves in pounds, cutting fabric by the yard and adding flour to a cookie recipe by the cup. But when it comes to "doing business" in America, there are some other important measurements.

Farmers often talk about the number of acres that they plant in a particular year.

How big is an acre? An **acre** was the descriptive name given in about 1300 AD to the amount of land that one man with his oxen and plow could plow in one day. This amount tended to vary since some land was easier to plow than others. Today an acre is equal to 43,560 square feet. That's about the size of a football field, not including the two end zones.



Another important measurement for the business of agriculture is the **bushel**. A large basket about the size of a round laundry basket is the unit used to measure yield or the amount of a crop produced. While a bushel container might look the same for apples, potatoes or wheat, the weight changes because of a product's size and density.

or 20 Cwt. So a crop of tomatoes that weighs 14 tons (which is 14 x 2,000 lbs., a total of 28,000 lbs.) is 280 Cwt. Since cattle, sheep and hogs are sold by the pound and thousands of pounds may be sold at a time, the two zeros representing hundreds are dropped and Cwt is used to shorten the number. For example, if you are selling 300 hogs and each weighs about 200 lbs., you have 60,000 lbs. to sell, or 600 Cwt.

When the weight of a product really gets big, the farm product is sold in **metric tons.** A metric ton equals 2,205 pounds. In 2003, the United States exported \$56 billion worth of agricultural products around the world. That's quite a few metric tons! Some of the products sold included 99 million metric tons of grains (corn, wheat and soybeans), 2.4 million metric tons of poultry (chicken and turkey) and 2 million (chicken and turkey) (chicken and turkey) and 2 million (chicken and turkey) (chicken

Did you know?

The Utah Department of Agriculture and Food is responsible for the accuracy of all measuring devices in the state including grocery store scales and fuel pumps at service stations. All weighing or measuring devices used by the public are subject to inspection to ensure their accuracy. Most items purchased each day are sold by weight, measure or count. Inspection of weighing and measuring devices for correctness and accuracy helps to protect both consumers and retailers from unfair business practices.



metric tons of vegetables.

Online Expedition

Investigate the history of measurement. What kinds of measurement units and tools were used in the past? Can you find any information about the use of rocks? Did people really use body parts to measure items? What did Leonardo daVinci say about a person's span, height, and fathom?

Gather several common items and measure them using historical measurement methods.

Convert the bushel weights to metric units. For help visit **www.sciencemadesimple. com/conversions.html.**

How much is a million?

YEARS 0 171 342 513 685

1,370

If you were a millionaire and you spent \$1,000 every day, it would take you 1,000 days (or just less than three years) to spend all your money.

Billionaire (\$1,000,000,000)

Millionaire

(\$1.000.000)

If you were a billionaire and you spent \$1,000 every day, it would take you approximately 2,740 years to spend all your money!*

*In other words, if you lived to be 80 years old, you would need about 34 lifetimes to spend all that money!



Homes **ALTERNATIVE**

ENERGY RESOURCES

ecent high prices at the gas pump have fueled American interest in alternative energy. Americans depend on fossil fuels - oil, coal, natural gas - to heat our homes, generate electricity and provide fuel for our cars. Fossil fuels are nonrenewable resources - energy sources that, once they are used up, cannot be replaced. However, renewable resources are ones that can be "renewed" or made available forever.

Agricultural scientists, engineers and farmers have been working with both renewable plants and animals to grow more than food. They are working to grow renewable energy sources.



Ethanol

Ethanol is an alcohol fuel made by fermenting the natural sugars found in corn, wheat, potato waste, sawdust, urban waste and lawn clippings. A new process that is in the experimentation stage will use enzymes to break down cellulose in woody fibers so that ethanol can be made from trees, grasses and crop waste. Research is even being conducted on oranges, using the fruit's peel and pulp, to produce ethanol.

Biodiesel

The fastest growing alternative-transportation fuel in the United States is biodiesel. This is a fuel made from vegetable oils, animal fats or greases. Most biodiesel made today is from soybean oil,

but corn is another plentiful source. An interesting source for biodiesel is restaurant grease. When this fuel is used in an engine, the exhaust smells like French fries!

Biodiesel has many advantages to traditional petroleum diesel. It is made from renewable sources and is less harmful to the environment. It burns cleaner, and if it is spilled, it breaks down in the environment. It even smells better

than traditional diesel fuel. A big advantage is that biodiesel can be used in today's vehicles without any changes to the engines.

Methane

In addition to ethanol and biodiesel, methane is an important biofuel. Methane is the main ingredient in natural gas and is odorless and colorless. It is relatively clean-burning compared to fossil fuels, but it is flammable and there is a possible danger of explosions.

Many cities are recovering methane from their landfills. As garbage rots and decays, methane gas is produced. Farmers are also using methane produced by animal waste as electricity sources for running their farms. This process uses biogas digesters which are airtight containers in which waste is fermented to produce methane gas. These digesters might be the answer to energy needs in developing countries where forests are being destroyed in order to burn wood for energy.

Biomass

Biomass is the term used to describe the renewable-energy sources that come from plants and animals. Wood, animal waste, agricultural crops and urban waste (garbage) are all considered biomass. Biomass is converted into energy by burning it, fermenting it (turning it into alcohol), letting it decay or using chemicals to convert it into a gas or liquid. Recently, trash is being burned to generate electricity. Imagine that—your local landfill might be a valuable energy resource in the near future!

Biomass is probably the oldest source of energy used by humankind. And it is interesting to note that, despite the world's dependence on fossil fuels, biomass is the number one energy source used throughout the world. That might seem odd to Americans who rely heavily on coal and oil as energy sources, but many people worldwide use decaying wood and animal waste to heat their homes and cook their food.



KON OLSON, DESERET MORNING NEWS



There are some energy sources that are neither renewable nor nonrenewable. These resources are called NONEXHAUSTIBLE RESOURCES. Solar, wind, water and geothermal energy are nonexhaustible resources that are currently used to generate electrical power.

Wind Power

Wind power is the fastest-growing nonexhaustible energy source in the world. In the United States alone, wind turbines valued at nearly two billion dollars were operational in 2003 – enough to power about 800,000 homes. Wind power is growing in popularity throughout the United States partly as a result of improvements in technology and partly in response to savings offered by state and federal energy programs.

"Wind farms" reduce air pollution and keep the environment clean for future genera-

tions. Wind energy also makes us less dependent on fossil fuels and encourages the development of renewable and nonexhaustible energy sources. In Utah, 12,000 customers have already signed up to purchase electricity from wind resources.

Online Resources

PacifiCorp: www.pacificorp.com

Energy Information Administration: www.eia.doe.gov/kids/energyfacts/sources/renewable/biomass.html

International Energy Association: www.aboutbioenergy.info

The National Energy Education Project: www.need.org



Energy and fuel issues

Activity

Find an article from the Deseret News that covers a current topic related to energy or fuel. How are you affected by this topic? How is your community or state affected by this topic? How is our nation affected? How has this topic affected the world?

Fuel shortage

Read the Deseret Morning News and make a list of the ways that our society uses fuel (for example: gasoline for our automobiles, electricity for our homes). Before these sources were available, what did we use for fuel? What sources might replace our current fuels in the future?

Forecasting America's energy future

The United States has approximately 5 percent of the world's population, but it uses approximately 25 percent of the world's energy. The United States is also the world's biggest energy producer.

With a group of your classmates, develop a futures wheel for a future alternative energy source for the United States. A futures wheel takes an in-depth look at a particular issue and helps to identify consequences or impacts of our decisions. (An example can be seen at **www.cpfonline.org/cpf/fwheel.php**). Choose one energy source and brainstorm the impacts that this source will have on the United States. Be sure to include environmental, economic, political and social impacts.

Be Label Able Web

What is a food label? Why do we put labels on food? Have you ever looked at a food label in the grocery store or while you were eating your favorite snack? The "Nutrition Facts" food label found on the outside of packaged foods provides information about the

FOOTNOTE

nutrients that are found in that particular food. This information also helps us to decide what we are getting from a particular food and how much we might want to eat,

based upon the content of nutrients such as carbohydrates, fats and sugars.

You don't know how to read a food label? Take this WebQuest journey to learn more nutrition facts and how they relate to the new "MyPyramid" food guide. When you complete the WebOuest you will be able to explain what the nutrient label tells you about food nutrients, the significance of serving size and how the nutrients might affect your total food energy or calorie needs.

Anatomy of a food label

Sample label for Macaroni & Cheese

,		campic labor for macaroni a circ	,,,,		
1 START HERE —	>	Nutrition Fa Serving Size 1 cup (228g) Servings Per Container 2	cts		
O		Amount Per Serving	- 53		
2 CHECK CALORIES		Calories (250) Calories from Fat 110			
		% Daily	Value*		
3 LIMIT THESE_		Total Fat 12g	18%		
		Saturated Fat 3g	15%		
	-	Trans Fat 3g			
NUTRIENTS		Cholesterol 30mg	10%		
		Sodium 470mg	20%		
		Total Carbohydrate 31g	10%		
		Dietary Fiber 0g	0%		
		Sugars 5g			
		Protein 5g			
OFT FNOUGH		Vitamin A	4%		
GET ENOUGH OF THESE NUTRIENTS		Vitamin C	2%		
		Calcium	20%		
		Iron	4%		
		* Percent Daily Values are based on a 2,000 c Your Daily Values may be higher or lower der your calorie needs.			

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WebQuest Journey

Join the "Label Able WebQuest" team and begin your quest by accessing the www.agclassroom.org/webquest/ labelable.htm Web site. Follow the links on this Web site to answer the following questions. At the end of your quest, you'll not only know all about nutrient fact labels, you will get to use your knowledge to balance your diet in a simulation game.

How are food labels like a table of contents?

What items are listed on food labels?

List seven foods that contain protein.

According to the Calisthenics Calculator, how many calories did you burn?

Look at the two food labels. There are two types of milk. Which one has more calories? Which one has more calcium?

Take a look at some food labels that do not have any identifying information and guess the product.

Why do you need to understand a food label?



Total Carbohydrat







Nutrition Facts

FOOD

Credits: Information for this educational section was provided by Utah Agriculture in the Classroom: Debra Spielmaker, director; Grace Struiksma, Project Coordinator; Denise Stewardson, Outreach Coordinator; Yasuko Mitsuoka, graphic artist. The project was under the direction of Carolyn Dickson, Deseret Morning News Newspapers in Education manager, and format and page design by Lou Ann Heller, Deseret Morning News art department. Additional assistance from Brenda K. Smith, NIE.

Resources: Utah Agriculture in the Classroom; Utah State University Extension: American Farm Bureau Federation "Farm Facts;" U.S. Dept. of Agriculture, Center for Nutrition Policy and Promotion; Cattlemen's Beef Board and National Cattlemen's Beef Association: Minnesota Agriculture in the Classroom; The NEED Project; South Carolina Agriculture in the Classroom.

Web sites

www.agclassroom.org/ut www.extension.usu.edu www.mypyramid.gov www.need.org www.agday.org

Want to Learn More?

Contact Agriculture in the Classroom 435-797-1657 or www.agclassroom.org/ut