

Resource Round-up

Standards of Learning

Science: 3.10, 3.11, 4.9

Social Studies: 2.7

Objective

Students will:

- Identify and match plants and the crop produced
- Identify and match animals and the raw commodity produced
- Correlate plant and animal with the by-product

Materials

- Pictures (attached) of crops and animals that are among the top 20 in Virginia:
 - peanut, tomato, soybean, cotton, forestry (trees), dairy cow, chicken, sheep, corn, beef cattle, grape vines, apple trees, wheat field, potato, pig
- Large bag such as a grocery bag
- Raw/Base Product Items:
 - Peanut
 - Tomato
 - Soybean
 - Cotton boll
 - Tree bark
 - Milk container
 - Egg
 - Wheat seeds
 - Grapes
 - Wool
 - Potato
 - Corn
 - Beef jerky
 - Apple
- By Products:
 - Bacon package
 - Grape jelly
 - Small piece of wood
 - Peanut butter (or wrapper)
 - Package of cheese
 - Ketchup
 - Container of chicken nuggets
 - Soy crayon or candle
 - Cotton fabric
 - Dollar bill
 - Rayon yarn
 - Yogurt container
 - Mayonnaise
 - Lotion
 - Lipstick
 - Box mashed potatoes
 - Corn cereal
 - Marshmallow or gelatin (Jello)
 - Apple juice box
 - Bread or box of pasta
 - Snickers bar (or wrapper)
 - Empty container of medicine/gelcaps

Background Knowledge

Agricultural by-products are essential in the lives of modern Americans. However, many people overlook the link between by-products and their commodity of origin. This growing lack of knowledge leaves consumers unaware that much of what they use beyond food and fiber has an agricultural origin.

How well do you know your by-products? Link each raw commodity in the bag with its by-product. Try this fun activity.

Procedure

1. Display pictures of plants and animals raised in Virginia.



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2. Provide a bag of products which we use from the plants and animals. Ask students to match each crop with the appropriate plant picture. Next students should match the animal with the base product it is known for such as milk matches with the dairy cow. This is known as the raw commodity for both plants and animals.
3. Check for accuracy.
4. With the remaining items challenge students to use reasoning and deduction to correctly link the raw commodities and their by-products.
5. Discuss what new facts the class learned.

Extension

- Research other by-products from the plants and animals in the pictures
- Research a commodity grown in Virginia and develop a raw commodity and by-product chain.

Commodity Facts and Product Matches *(note: some by-products may be correctly matched with more than one raw product)*

Peanut Plant – Peanut – Peanut Butter, Snickers Bar: Virginia grows a special variety of nut called Virginia-Carolinas. These peanuts have the largest kernels and account for most of the peanuts roasted and processed in-the-shell. When shelled, the larger kernels are sold as snack peanuts, they are also used in Snickers bars. Virginias are grown mainly in southeastern Virginia and northeastern North Carolina. A peanut is actually an underground pea, or legume, rather than a true nut.

Tomato Plant – Tomato - Ketchup: Virginia ranks 3rd nationally in fresh market tomato production (tomatoes grown to be enjoyed whole, rather than those grown to be processed into other products). This salad staple is grown predominantly on the eastern half of the state as well as in greenhouses and hydroponically (without soil). Tomatoes are planted after the last frost and will produce fruit in 65 to 75 days. Tomatoes come in many sizes, shapes and colors.

Soybean Plant – Soybeans – Soy Crayons, Soy Candle, Mayonnaise: Soybeans are an incredibly versatile plant which can be used in a wide variety of application – from human consumption, such as in tofu, mayonnaise and chocolate to animal feed, as well as non-food uses such as inks, dyes, insecticides, car seat foam, candles and even crayons. Prang Fun Pro makes a crayon that is 85% soybean oil. It took a team of chemists and product developers two years to bring this unique crayon to consumers. One acre of soybeans can make 82,368 crayons. Soybeans are farmed throughout Virginia and are the state's top crop.

Cotton Plant – Cotton Boll – Fabric, Dollar Bill: Cotton is planted in rows during the spring; about two months later, flowers develop from the buds. When the flowers die and fall off, they leave behind pods called bolls. After the bolls ripen and break open, the cotton fibers emerge. After the cotton is picked, it is sent to the gin for the seeds to be removed (there are 5 cotton gins in Virginia) and goes through a long process of cleaning and sewing before it can be used to make blue jeans and other clothing items. In addition to fabric, cotton fibers are also used in paper money. Cotton's seeds and hulls are useful as well, cotton seeds may be used in cooking oil while the hulls are ground up and used in animal feed.

Tree – Bark – Wood, Rayon Yarn: More than 5,000 products are made from trees. One is rayon, a silk-like fabric that was the first manufactured fiber. It's made from cellulose acetate, which



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comes from wood pulp. The cellulose is dissolved by chemicals, forced through tiny holes in a metal spinneret, and then twisted into silky yarn.

Dairy Cow (Holstein) – Milk – Yogurt, Cheese: The most widely recognized dairy cow is the Holstein, which has black and white spots. The spots are similar to people's fingerprints in that no two cows have the same pattern of spots. Dairy cows tend to look more "boney" because all of their energy is going to make milk, whereas beef cattle tend to be bulkier. Dairy farmers milk their cows at least twice a day, every day. Most dairies used automated milking machines, some even use robotics to maximize efficiency and cow comfort. One cow produces 90 glasses of milk a day, and 200,000 in her lifetime. In fact, a cow's udder can hold 25-50 pounds of milk! Dairy is Virginia's third largest agricultural commodity.

Chicken – Egg – Mayonnaise, Chicken Leg/Nuggets: There are several types of chickens grown in Virginia. Layers are grown to produce eggs. Broilers are raised to produce poultry products. It takes a chicken about 24 hours to produce one egg. It is very likely that the egg will be laid between 7 and 11 a.m. during the day. One chicken will lay approximately 250 eggs per year.

The color of a chicken egg is determined by the feather and earlobe of the bird. So the brown hen will lay a brown egg while the white hen will lay a white egg. The nutritional value of an egg is determined by the diet of the bird not the color of the egg. The diet of the bird also determines how yellow the yolk will be. An egg's shell color doesn't indicate the quality or nutritional value of an egg, but rather the breed of the hen that laid it. The color of an egg yolk is determined by a hen's diet. Like shell color, it has nothing to do with an egg's nutritional value. If you crack open your egg to discover a dark yellow yolk, the hen was probably fed green vegetables. A medium-yellow yolk would indicate a diet of corn and alfalfa while a light-yellow yolk could be the result of eating wheat and barley.

Labels on eggs-

Cage-free — These hens are free from the confines of a cage, but this does not necessarily mean they are raised outside. More often, they are free to roam a barn or warehouse, but their living conditions can vary widely.

Natural — Anyone can use the term "natural" to describe their eggs, so this does not denote anything specific.

Free-range — This means hens are free to roam the outdoors at some point, but there is no regulation specifying how long is necessary.

Certified Organic — Hens have some access to the outdoors and are fed an organic vegetarian diet that excludes any pesticides, animal by-products, or genetically modified foods.

Sheep – Wool – Lotion, Lipstick/Chapstick: Wool from sheep contains lanolin, which helps the wool repel water. During processing, the lanolin is removed from the wool for use as a moisturizer in many soaps, facial creams and lotions.

Corn Plant – Dent Corn – Biodegradable Packing Peanuts, Corn Mug, Corn Cereal:

According to the National Corn Growers Association, there is a use for every part of the cornstalk—husks, kernels, and even the water that kernels are processed in. The vast majority of corn grown in Virginia is field corn, which is grown for animal feed. This is different from the sweet corn variety that people enjoy. Corn is a very starchy plant; the starch can be used in biodegradable plastics like a coffee mug, diapers, and packing peanuts.



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Beef Cow (picture is of a black angus) – Raw Beef – Beef Jerky, Marshmallow/Gelatin: Beef cattle are raised across Virginia. Beef products are used for a variety of purposes; in fact, 99% of each steer is able to be used in products for consumers. In addition to the obvious items such as steak and ground beef, beef byproducts are also found in food items such as Jello, marshmallows, gum, and even gummy bears. Leather comes from cattle as well which are key in the manufacturing of footballs, basketballs and baseball gloves.

Grape Vine – Grapes - Jelly: Virginia's grape production has grown significantly over the past decade. The state ranks 5th nationally in grape production. Virginia grapes are predominately used in the production of wine, however jelly is more child appropriate.

Apple Blossom (note the pollinator) – Apple – Apple Juice: Virginia growers produce an average of 8 to 10 million bushels of apples per year. Apple varieties grown in Virginia include Red Delicious, Fuji, and Granny Smith. The majority of apples in Virginia are grown in the Shenandoah Valley area.

Wheat Plant – Wheat Seeds – Bread, Pasta: Wheat is a versatile small grain. It can be grown in the fall or spring and is used for animal food or sold for human use in breads and cereals.

Pig – Bacon Package – Medicine Package: Pork is the most widely consumed meat in the world. In addition to bacon, sausage, and pork chops, there are many different byproducts that come from pigs. Gelcaps, insulin and even heart valves are a couple of the medical byproducts from pigs. Similar to cows, pig byproducts may also be used in gelatin and leather.

Potato Plant – Potato – Box of Mashed Potatoes/Hash Browns: Farmers in Virginia typically produce between 3,000 and 4,000 acres of potatoes. Growers in the state produce high-quality red, white, yellow and russet potatoes. A large number of Virginia potatoes are grown on the Eastern Shore.



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