



# Link 'Ems

Determine how well you know your by-products. Link each raw commodity with commonly used products.

## Activity

1. Collect samples of each of the raw commodities (walnut, wood, corn, wool, soybean) and each of the by-products (sandpaper, rayon, packing peanut, lotion, crayon). Put one of each sample into a bag and mix them together.
2. Separate students into small groups and ask them to sort the raw commodities from the by-products.
3. Challenge students to use reasoning and deduction to link the raw commodities and their by-products. If teams don't agree, suggest an impromptu debate in which each team defends its conclusion. Use the information below to explain the links.
4. Challenge students to identify the chemical processes used to create the by-products. For example, how does the molecular compound for cellulose differ from that of rayon? What caused the change?

### Walnuts

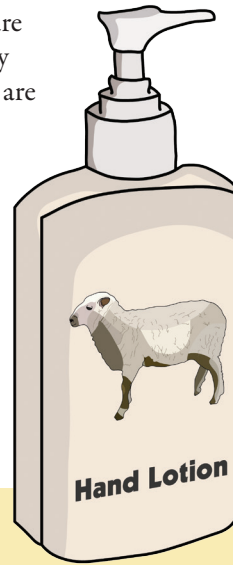
Walnut meat isn't the only part of the walnut fit for human consumption. Its oils are used in cosmetics, and the shells are used in many abrasives for sand blasting roads and cleaning engines. The shells are also used in the production of sand paper, snow tires, and pet litter.

### Wood

More than 5,000 products are made from trees. Rayon, a silk-like fabric, is made from cellulose acetate, which comes from wood pulp. The cellulose is dissolved by chemicals, forced through tiny holes in a metal spinneret, and then twisted into silky yarn.

### Corn

According to the *National Corn Growers Association*, there are uses for every part of the cornstalk—husks, kernels, and even the water the kernels are processed in. Many “packing peanuts” are nearly 100% corn. They dissolve in water, making them environmentally friendly.



## Materials

- Multiple samples of the raw commodities, such as walnut, wood, corn, wool, and soybean.
- A sample of products made from each commodity, such as sandpaper, rayon, packing peanuts, lotion, and crayons.

## Tip

Have students bring in their own products and ask the class to determine from what the product originated.

### Wool

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.

### Soybeans

Soybeans, used in the production of tofu, also make great crayons. *Prang Fun Pro* makes a crayon that is 85% soybean oil. One acre of soybeans can make 82,368 crayons!

## Classroom Activities

### Science

- Research the origin of the raw commodities used in this project. Present your findings to the class.
- Research products that you use daily. What are they made of? What commodity are they a by-product of?

### English Language Arts

- Identify the geographical regions that produce the raw commodities. Discuss where and why products come from these areas.

### Math

- Determine what percentage of the class linked the right products. Create a graph with the class results.

