

**Made in the U. S. A**

**-From Wood**

**Society of Wood Science  
and Technology**

**Teaching Unit Number 1**

**Slide Set 1**

**SWST**

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**Shopping centers,  
houses, apartments,  
office buildings,  
highways, bridges,  
automobiles, furniture.  
Have you ever stopped to  
think about what we use  
to make the things  
around us?**



**We make things from various raw materials. These raw materials are harvested, reduced to a useable form, and then shipped as industrial raw materials to industries that turn them into useful products.**

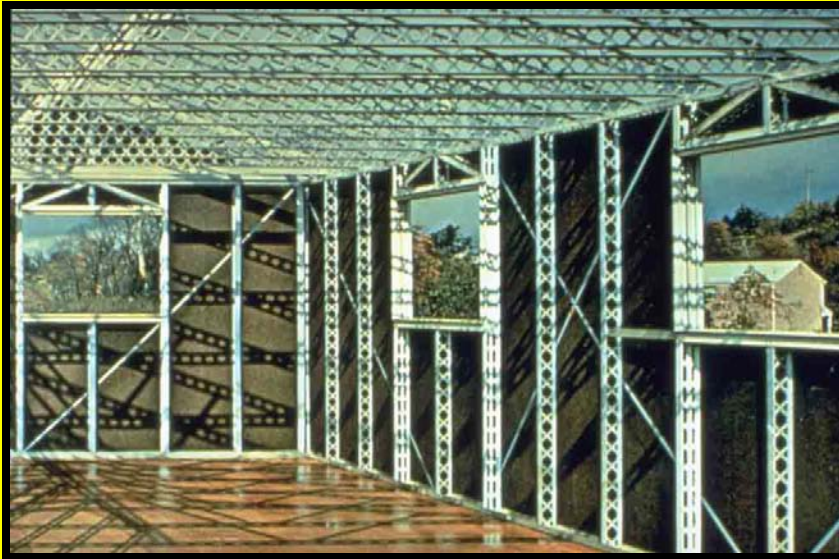




If you were asked which raw materials were used in greatest quantity in North America, what would be your guess?

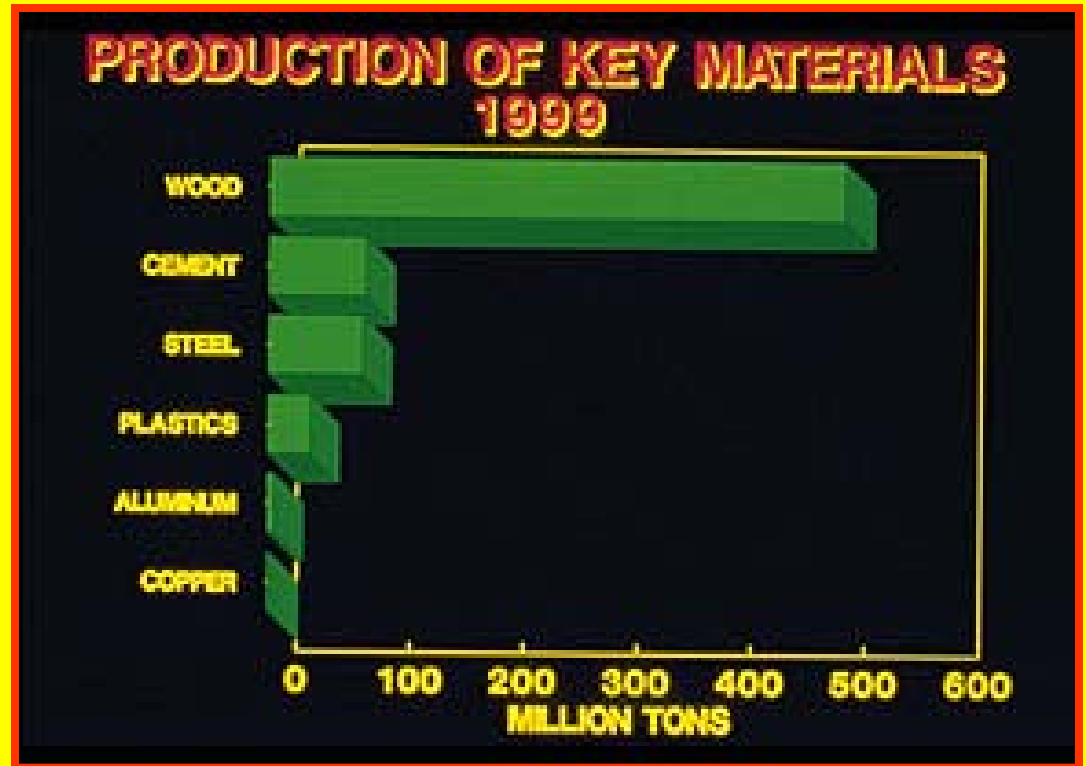
Steel? Aluminum? Concrete?

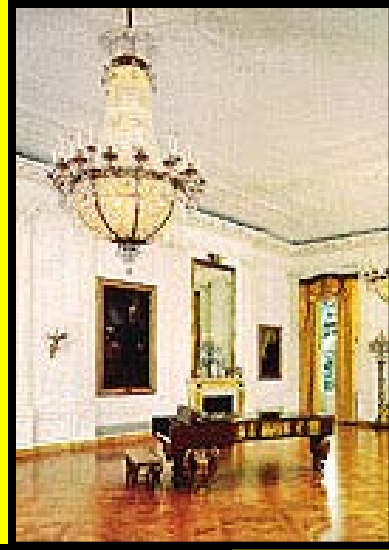
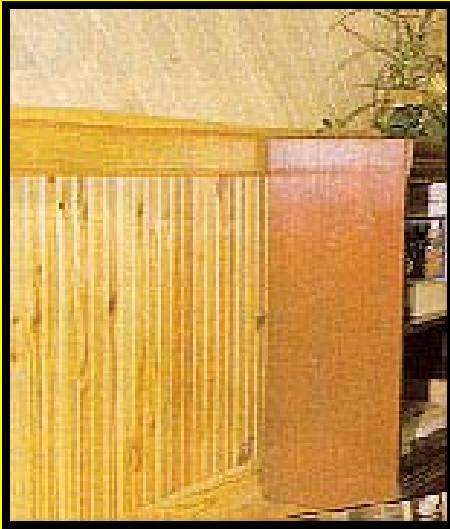
Wood?



You may be surprised to learn that the answer is clearly **wood**.

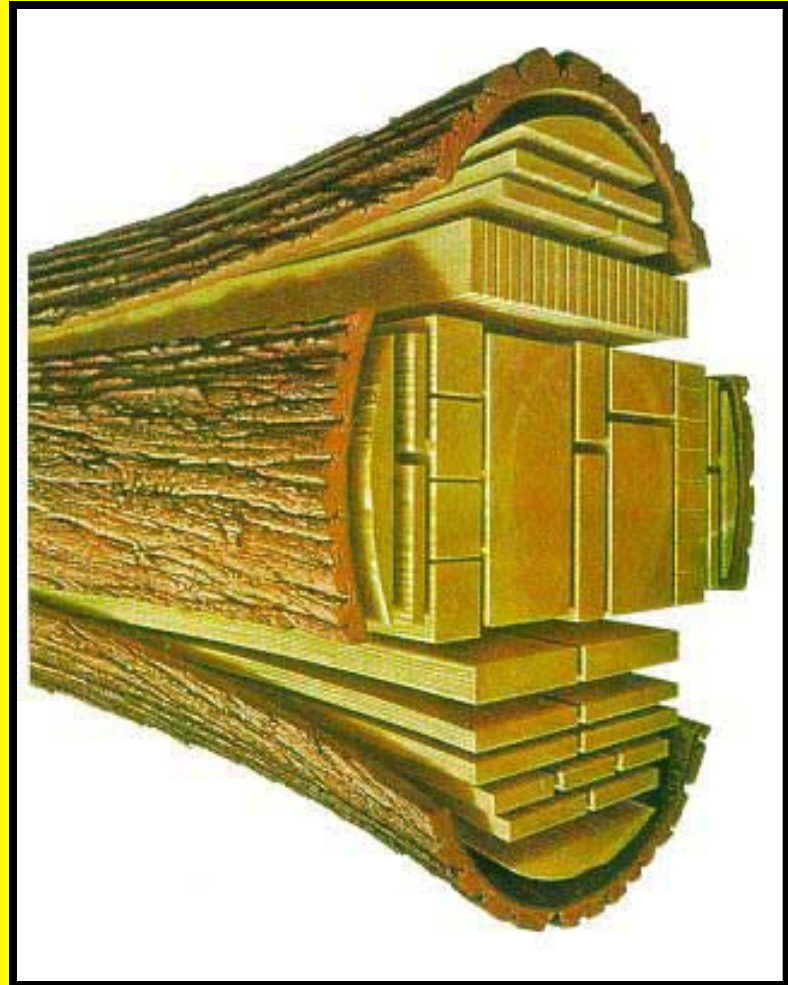
**For example, if we consider the weight of raw materials used, wood is not only number one on the list, but it is used in amounts that are roughly equal to all other industrial raw materials (including all metals) combined!**





**It is not difficult to think of products that are made from wood - they are all around us. Look around the room where you are now sitting, or around your house when you get home today. How many products that you see are made from wood?**

**Your list is probably quite long. All of you probably listed **lumber**. Lumber is solid wood that has been cut into different shapes. It is the principal framing material used in house construction.**





## Lumber is also used to make:

cabinets & furniture



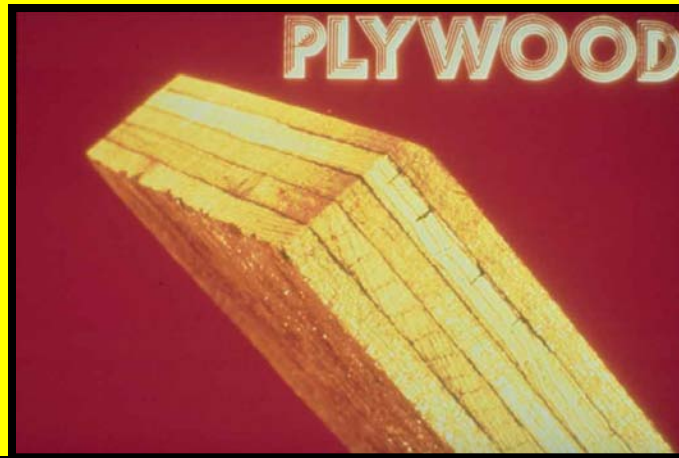
sporting goods & specialty products



laminated beams & many other items



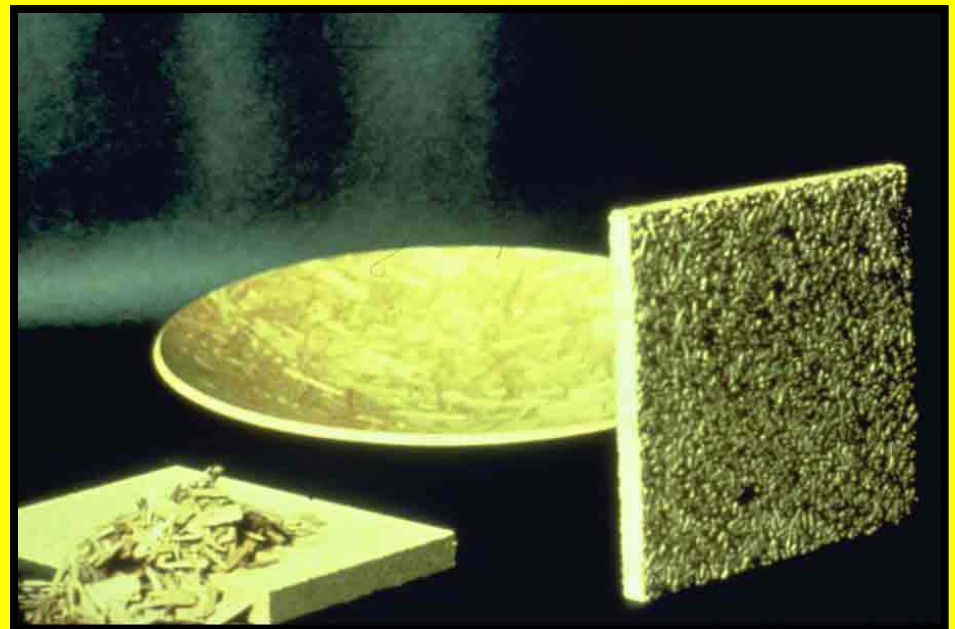




**Plywood** is probably also on your list. Made by cutting thin veneers and then gluing them back together with the grain direction of adjacent veneers at right angles to one another, plywood has a number of advantages over lumber.



Perhaps you listed **particleboard**. This is a product made by gluing small flakes, shavings, or splinters of wood together using heat and pressure to form larger panels.



Some kinds of **particleboard** are widely used in making table, dresser, and cabinet tops; particleboard used in this way is overlaid with wood veneer, vinyl, or other surface material. Other particleboards are commonly used as floor underlayment that is directly under carpeting or linoleum. Still other particleboards can be substituted directly for structural plywood.

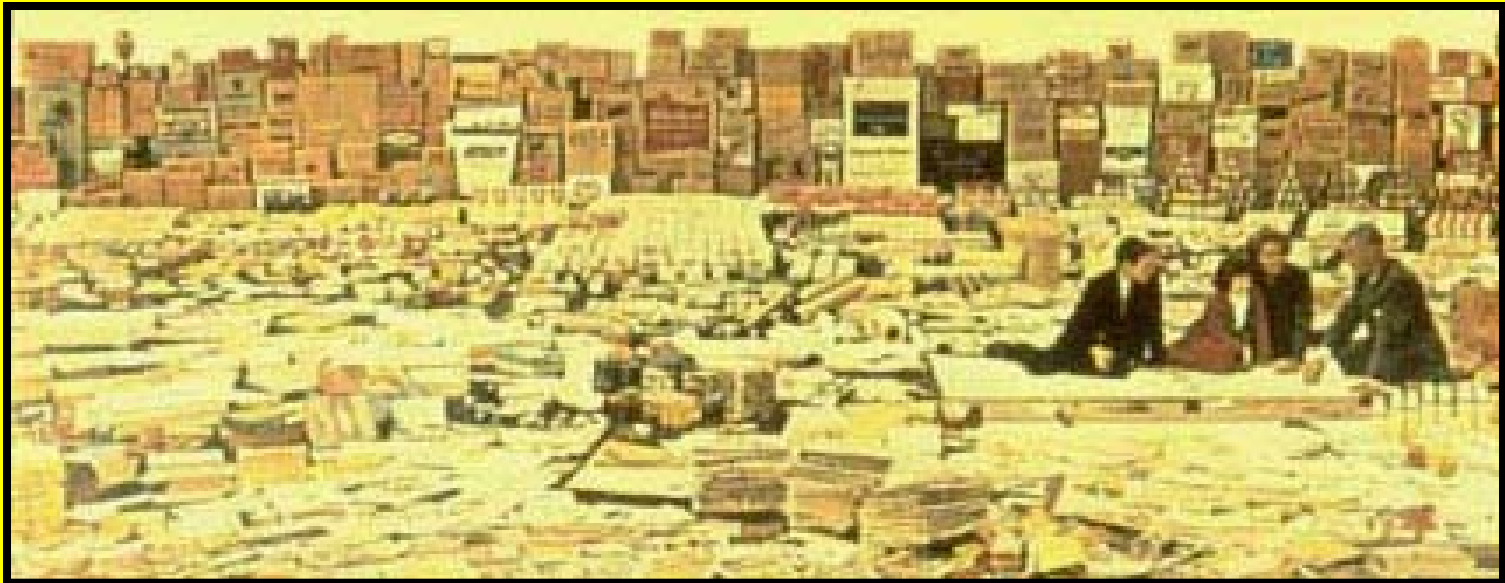




**Did you list **paper**? In the United States we annually consume an amount of paper equivalent to about 660 pounds for every man, woman, and child. Virtually all of this paper (97% +) is made from wood.**



**Pictured here is a family of four, surrounded by the paper products they would use in just one year. Of course, not all of these boxes and paper come into your house. Some of it is left at grocery stores or shopping centers where items are unpacked.**



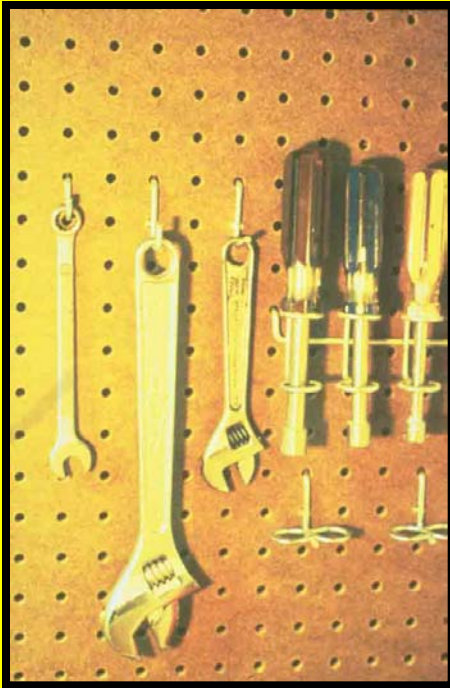
**As long as your list of wood products might be, it is probably incomplete. This is because many of the products made of wood are not readily recognizable as wood.**

**More and more products are appearing on the market in which wood is broken down into individual wood fibers or even down to constituent molecules before it is reassembled to form a product. In some of these products wood is even combined with other non-wood materials.**

**Let's look at a few wood products that you may have missed in making your list.**



**Hardboard** is made from wood that has been reduced to pulp. The pulping step is similar to that employed in making newsprint. The fibers then are formed into a mat and pressed using very high temperature and pressure. The result is a hard, dense mat known as hardboard.



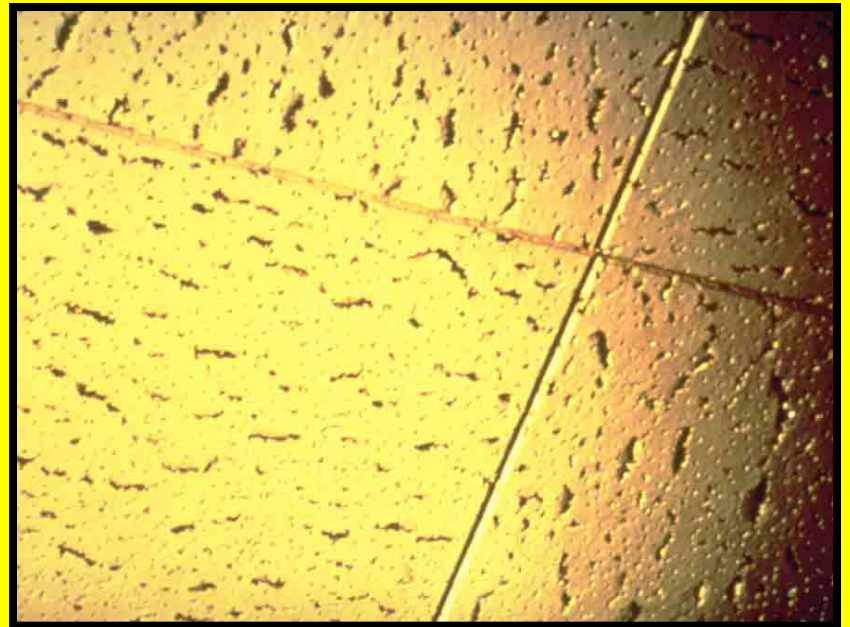
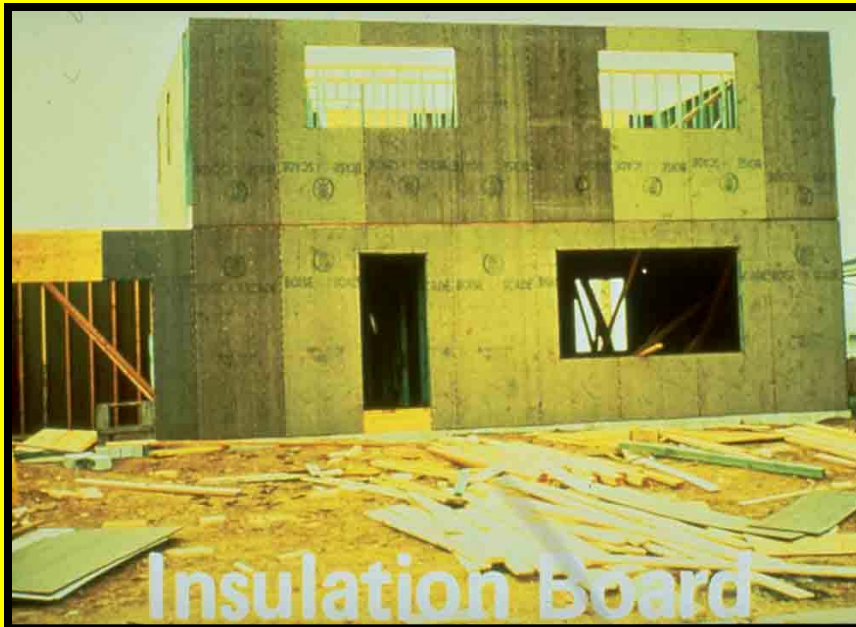
**Perhaps best known in the form of pegboard that is often found on garage walls and on the back of television consoles, hardboard can also be made with a textured surface to simulate lumber, brick, or stone.**

**Hardboard can also be molded into various shapes and is often used in the form of door liners and rearwindow decks in automobiles.**

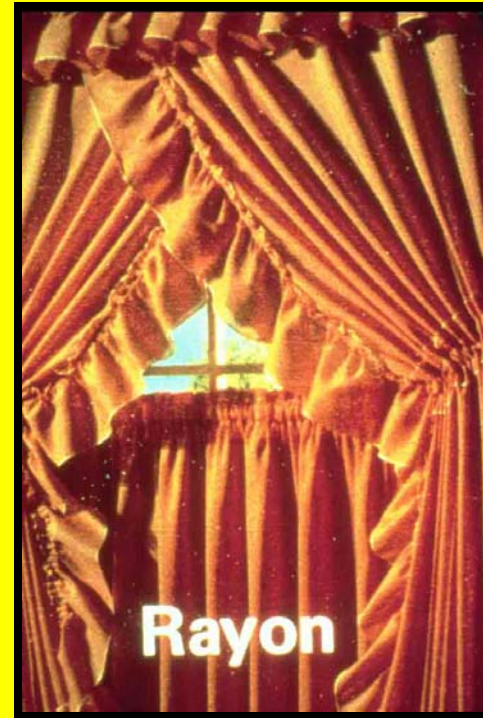




A wood product made in a process similar to hardboard is **insulation board**. This product goes in walls of buildings and under the siding, or, in a slightly different form, is used for acoustical ceiling tile.



**Rayon** is a product made from wood that is broken down into constituent molecules, followed by controlled regeneration of cellulose-like polymers. The curtains shown here are 57% rayon and the bed-spread is 60% rayon.



**Had you seen this woman walking down the street, you probably wouldn't have noticed that she was wearing a wooden (100% rayon acetate) dress! Rayon is also used in making shoes, socks, jeans, and as this ad shows, is even used in making tires. In fact, carbonized rayon (Carbon Fiber) is used as a light-weight skin for jet airliners.**



*This unique combination of advanced materials and technology makes The Advantage™ T/A the perfect choice in premium radials.*

- A. Varied pitch ratio reduces noise levels to ensure a quiet ride.*
- B. Deep lateral grooves in tread give excellent wet traction.*
- C. Dual compound tread optimizes tire life and mileage.*
- D. Rayon carcass provides a smooth, comfortable ride.*

*Michelin makes a complete line of new and T/A™ High Tech™ Radials that are respected worldwide for outstanding road performance. If you're looking for a tire that maintains the highest standards of quality, there's a High Tech Radial designed for you.*

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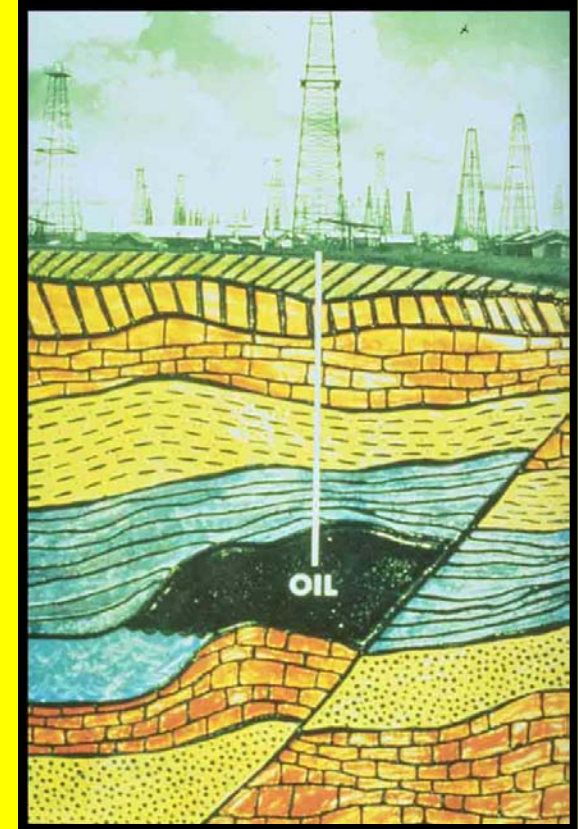
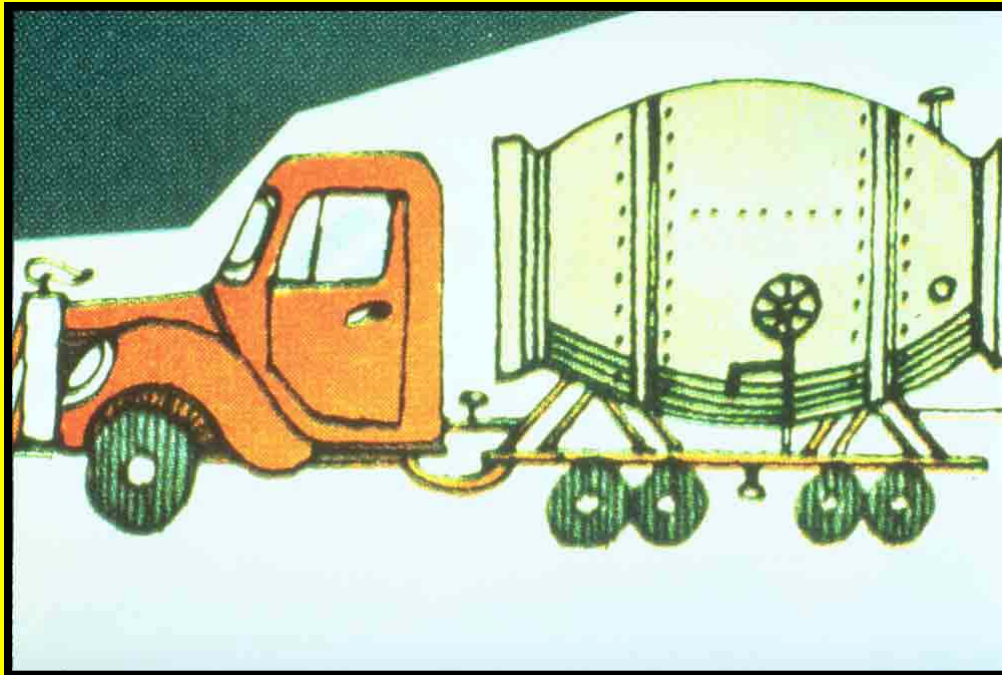


Some other products made using processes similar to the rayon process are **cellophane** (kitchen wrapping products) and **celluloid** as seen here in film products and ping pong balls. **Cellulose nitrate** is another variation used in making adhesives and lacquers.





Wood in the form of lignosulfonates is used as a dispersing agent in **Portland Cement** (usually comprising 0.3 % to 0.5% of the mix dry weight) and to help control consistency of oil well drilling muds.

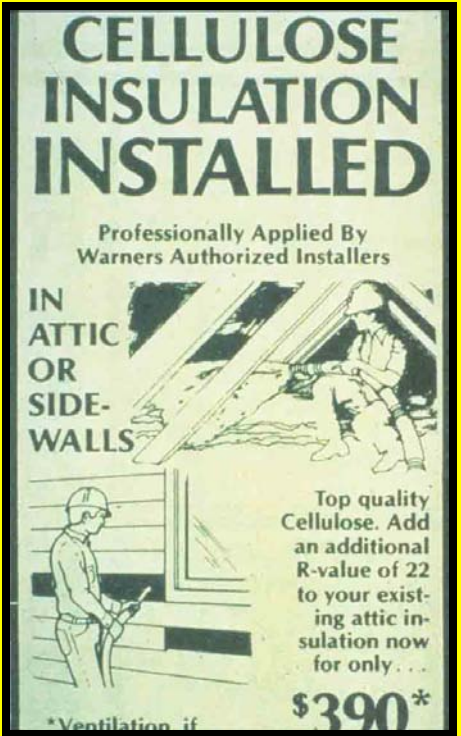


**Lignosulfonates** are even a major ingredient in artificial vanilla, a product used in making ice cream, cookies, and cake. In fact, wood is used in production of dietary cereal and bread. The dietary feature comes from the fact that human enzymes cannot break down cellulose and other polymers that comprise wood.





A number of other items, ranging from turpentine to attic insulation could be listed. But by now you probably have the idea - we use wood in enormous quantities for a variety of products that we use in our everyday lives.



**Now that you know about wood and the products made from it, see if you can identify the 21 items in the next photo that are made from**

**Wood.**

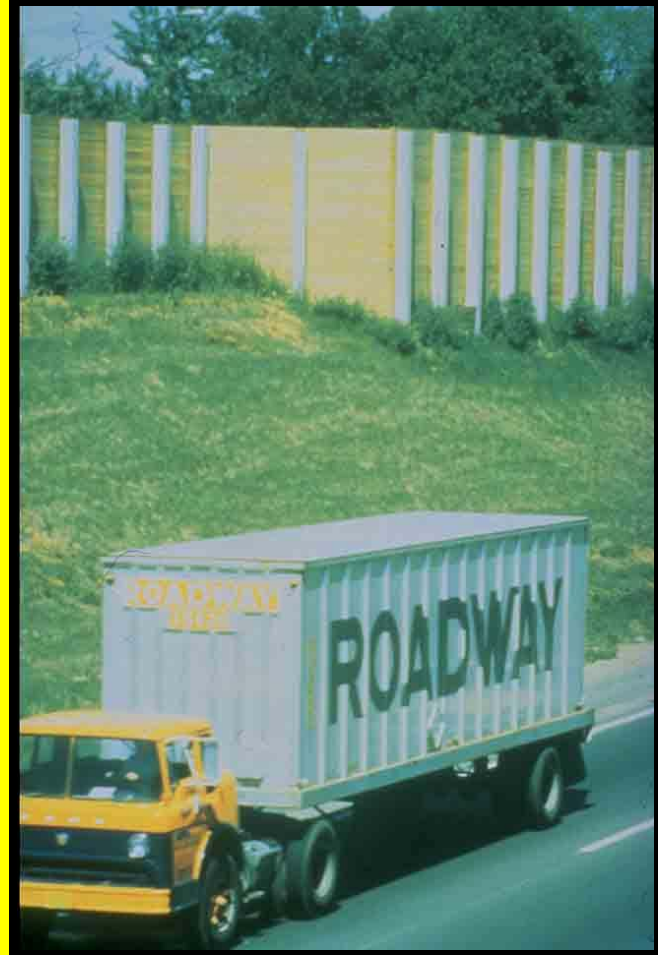




**The obvious wood products are the cabinets (2), the window sash and trim, the cutting board and knife handle, and the paper products - grocery bag, paper towels and napkins, frozen food containers (2), cereal box, milk and egg cartons, and calendar. Less obvious are the particleboard counter tops (2), the Formica™ covering (Formica is simply an assembly of plastic impregnated sheets of paper), the rayon curtains (2), the flavoring in the ice cream, and about one third of the breakfast cereal itself. For a grand total of 21. Did you get them all?**

**Let's try again. Where is the wood in this photo?**

**The trees in the background and the wooden sound barrier are obvious. But don't forget the molded hardboard in the cab of the truck, the plywood liner for the trailer, the rayon inner plies of radial tires, and the lignosulfonate in the road bed.**



**Everywhere we look we can see wood at work. It is essential to our everyday lives, a principal ingredient of the standard of living we enjoy. So the next time you see one of those labels "Made in USA", just think. Chances are high that the label should properly read,**

**"Made in USA - From Wood".**

**For additional information about the use of wood in our society you are encouraged to consult the following references and the SWST website (<http://www.swst.org>):**

**Flynn, J.H. and C.D. Holder (Eds.) 2001. A Guide to Useful Woods of the World. Forest Products Society, Madison, WI. <http://www.forestprod.org/>**

**Bowyer, J.L., R. Shumlsky, J. G., Haygreen. 2003. Forest Products and Wood Science - An Introduction, fourth edition. Ames: Iowa State University Press.**

**Howard, J.L. 2001. U.S. timber production, trade consumption, and price statistics 1965-1999. Res. Pap. FPL-RP-595. USDA Forest Service, Forest Products Lab., Madison, WI. <http://www.fpl.fs.fed.us/welcome.htm>**

**Leavell, C. 2001. Forever Green, The History and Hope of the American Forest. Longstreet Press, Inc., Marietta, GA.**

**Lincoln, W., A. Peters, L. Leech, J. Marshall, A. Walker, and L. Hughes. 1993. The Encyclopedia of Wood. Quarto Publishing plc, The Old Brewery, 6 Blundell Street, London N7 9BH.**

**Moore, P. 2000. Trees are the Answer. Greenspirit Enterprises Ltd. Vancouver, BC Canada.**

**Perlin, J. 1991. A Forest Journey: The Role of Wood in the Development of Civilization. Harvard University Press, Cambridge, MA.**



**Additional information concerning careers in the general field of wood science and technology, including those in production management, process engineering, technical sales, and product development can be obtained by contacting:**

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