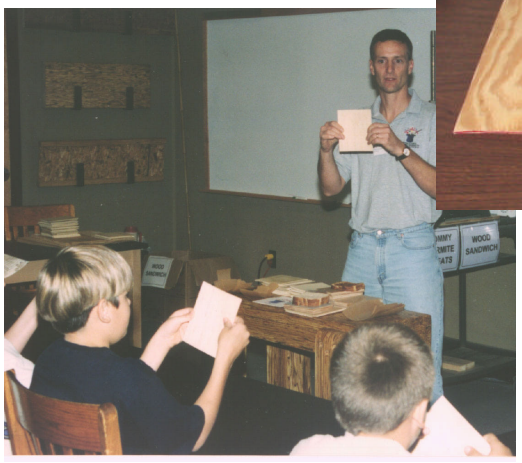
WOOD SANDWICH



Discussion

1. Explain what Plywood is. It is thin sheets of wood, called veneer, that are glued together with the wood grain in opposite directions. The sheets or "veneer" come from a tree that has been peeled with a knife lathe (like unrolling a roll of paper towels.) The strength and stiffness of wood depends on which direction the grain is going. "Grain" refers to the wood cells and is formed by the way in which the tree grows. Wood is much stronger and stiffer in the direction of the tree stem - parallel to the grain and less in the other direction.

2. Ask the children if they know what plywood is used for. It is used in the construction of our homes and other buildings. It is in the floors, walls, and the ceiling too! Plywood is very strong, but it is also light, which is good in construction.

3. Explain that plywood is really just a wood sandwich - layers of bread are the wood veneer and the cheese is the glue. We will make a triple decker wood sandwich.

WOOD SANDWICH

This activity shows how to make a large composite material from thin sheets of wood and glue paper - the wood sandwich - and shows the influence of grain "straw" direction on stiffness.

Materials

Cheese sandwich as the example

Extremely thin pieces of veneer about 6" square (Furniture grade veneer can be bought at a home improvement store)

Glue paper sheets

Hot press or iron

Tin Foil

#5 Binder clips

INSTRUCTIONS

1. Each group will receive three pieces of veneer and two pieces of glue sheet.

2. Demonstrate to the children and allow them to follow you (make sure they are careful with the veneer, not to snap it by bending too far.)

3. Place the veneer sheets together, making sure the grain is in the same direction.

4. Have the children slightly bend the veneer, noticing its stiffness.

5. Then, change the direction of one piece of veneer, so that the grain of the veneer is in opposition to one another, have the children do the same test of slightly bending the veneer, observing the stiffness. This test should demonstrate to the children how much stiffer it is when placed in this direction.

6. Have the children place the two pieces of glue sheets between the veneer. Make sure the grain in the center veneer is perpendicular to the face veneer.

7. Place a piece of aluminum foil on either side of the stack.

8. Continuously iron each side of the 3-ply stack for 3 minutes while applying pressure (teacher assistance needed.) (OR place in a heated press for 5 - 6 minutes)

9. Clamp each side of the "plywood" with two binder clips, size 5.

10. Allow the 3-ply stack to thoroughly cool.