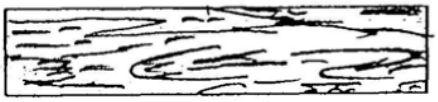
Structures Handout

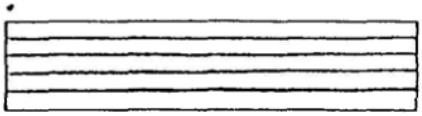
Orthotropic and Isotropic Material

The corrugated cardboard we will use is an orthotropic material. This means it is stronger, both in compression and tension, in one direction than in the other.

Many materials have "grain" or lines running through them, in one direction (orthotropic.) You can see this clearly in wood and in the wavy layer of corrugated cardboard. Most, but not all materials have this characteristic but tend to be more or less strong in opposing directions. Paper and steel have good strength in opposing directions but are definitely stronger in one direction that the other. Glass on the other hand is isotropic. It has no "grain." And is isotropic.



Wood



Corrugated Cardboard

Since material is strongest in compression and tension along its orthotropic lines it will be essential for you to cut your corrugated cardboard with this in mind.

Name _____ **Period** _____ **Date**

Orthotropic and Isotropic Material

Homework Questions

1. What is an orthotropic material?

2. Name three orthotropic materials.
   i. _____
   ii. _____
   iii. _____

3. What is an isotropic material?

4. Name three isotropic materials.
   i. _____
   ii. _____
   iii. _____