Paper is a major product of the forestry industry, and is used widely in our society.

Wood consists of two primary components: cellulose and lignin. **Cellulose**, which is the fibrous component of wood, is used to make pulp and paper. **Lignin** is the “glue” that holds the wood fibers together. Pulping is the process that reduces wood to a fibrous mat by separating the cellulose from the lignin.

The manufacturing (Kraft) process involves six steps:

**Step 1 - Wood preparation**
The bark is removed from in-coming logs, and these are then chipped. Sometimes, the wood arrives at the plant already chipped, meaning that this step is unnecessary.

**Step 2 - Cooking**
The wood chips are heated in a solution of NaOH and Na₂S in a pressure cooker, during which time a lot of the lignin is removed from the wood. The pressure is then released suddenly, causing the chips to fly apart into fibres.

**Step 3 - Pulp washing**
The pulp is washed with water to wash out the cooking chemicals and lignin from the fiber so that they will not interfere with the downstream processing of the pulp.

**Step 4 - Pulp screening**
A sifter is used to remove knots and clumped-together uncooked fibres from the pulp.

**Step 5 - Bleaching**
This is done in two stages. Firstly, the pulp is treated with NaOH in the presence of O₂. The NaOH removes hydrogen ions from the lignin and then the O₂ breaks down the polymer. Then, the pulp is treated with ClO₂ then a mixture of NaOH, O₂ and peroxide and finally with ClO₂ again to remove the remaining lignin. After that, the pulp is spread out into smooth, pressed sheets (often with chemicals added to provide particular properties such as colour or water resistance).

**Step 6 - Paper making**
The fibers are mechanically and chemically treated to make them bond better to each other (strengthening the paper), chemicals added to provide special properties such as colour or water resistance, and then the water is squeezed out and the pulp is rolled smooth and dried.

**References:**