

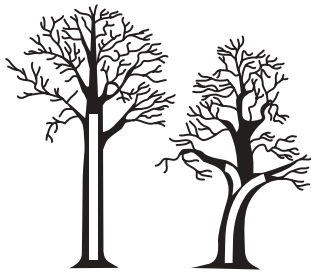


How did the Vikings build their ships?



These basic methods would have been used for both the longship and the knarr.

Step one Ships were built as close to the water as possible. They also had to be built close to a good supply of timber from a wood or a forest. Once the tree had been cut the wood would be used straight away or sometimes stored under water in lakes or in bogs, to keep it supple enough to work with.



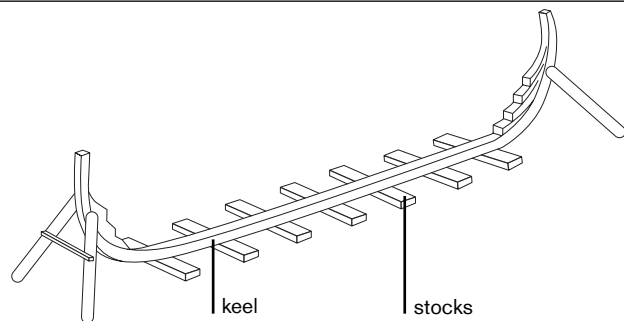
Tall and straight and misshapen trees could be used by the Viking boatbuilders

Step two Oak was the most popular type of wood used for shipbuilding, because it is strong and can be split into flexible planks. Alternatives included pine in Norway and occasionally, ash, birch, alder and lime, with willow used for fastenings. It was not only the type of tree but also the tree shape that had to be considered. A ship's **keel** would come from a straight-growing tree-trunk. The angled and curved joints between trunk and branches were useful for making the ship's **ribs**.

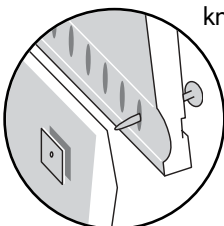


The join between a branch and the trunk could strengthen the boat

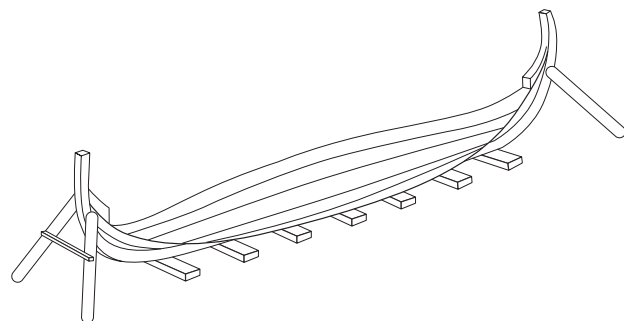
Step three The ship was built on top of **stocks** which it would rest upon. The first thing placed on the stocks was the **keel**. This is the backbone of the ship and was usually made of strong oak, as it received the most scrapes on rocks and beaches. To each of its ends were fitted the **stem-** and the **sternposts** with heavy nails to stop them from moving.



Step four With this basic frame ready the Vikings then added the **strakes** – the layers of planking, each one made of several planks joined end-to-end. The first strake was fitted to the keel, the next was fitted so its lower edge covered the outer top edge of the first strake. Boats made with this system of overlapping strakes are known as **clinker-built** from the nails being driven through the planks from outside and their points **clenched** (bent over) to secure them inside.



Joining the strakes

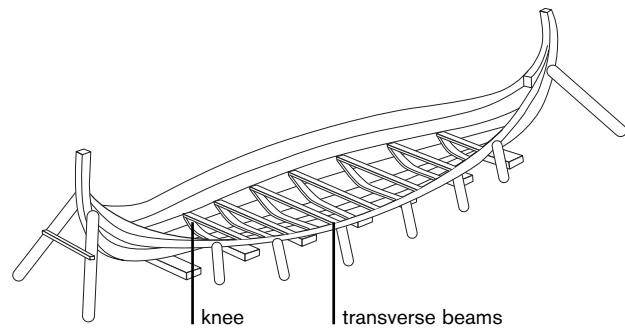




Teachers' notes 1

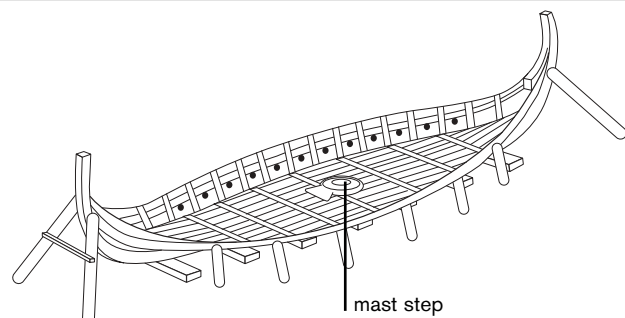
Ships and navigation *sheet 2 of 2*

Step five Once the strakes had been built up to the waterline the ribs were then put into place. These were fixed into place with wooden pegs (**trenails**) and strengthened by cross-beams across the boat, supported on **knees** (angled timbers).

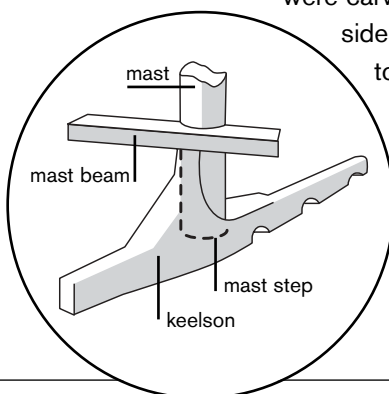


Step six From this stage more strakes continued upward until the stem and the sternposts were joined all the way up.

Step seven The **mast** then had to be added. This was placed into a **mast step** which was a hole cut into the keelson. The keelson was a heavy piece of wood fastened to the keel. It allowed for a greater distribution of the weight of the mast and also offered it support. Holes were carved into the sides for the **oars**



to fit through and the distinctive **side-rudder** or **steer-board** was fixed at the ship's stern.



Please note: Vikings made their ships watertight by putting tarred and twisted woollen fibres between the planks as the ship was built up.