Material Research and information for group project

1.Materials  
Specified in the brief, there is a list of available materials. Research will be done on materials that will likely be used considering the design, i.e. this design will be purely kinetic so no research into plastic for propellers is required. Information will be gathered to assess the following; balsa wood strip (1000mmx100mm) in 1mm, 2mm and 6mm thickness, balsa wood spars (90”)-4mmx4mm and 6mmx6mm, zap-a-gap adhesive.

1.1Balsa Wood General Properties   
Balsa is hardwood native to South and Central America. It is known for being incredibly light but unexpectedly strong. It is described as “the weakest of all commercial species” in comparison to other hardwoods and has a very high moisture content, which means when it is dried it works very well with adhesives. Balsa is generally very easy to work with and has little dulling effect on cutters, however it should be ensured cutters are sharp to discourage crumbling of the wood. Statistical information for balsa wood is as follows:

* Dried density 150kg/m3 –white oak 755kg/m3 for comparison
* Janka Hardness (amount of force required to imbed 11.28mm steel ball into the wood up to 50% diameter) 300N –white oak is 5990N for comparison
* Modulus of rupture i.e bending strength 19.6MPa (pressure required before rupture upon bending) – 102.3MPA
* Modulus of elasticity (measures woods stiffness)

(Wood Solutions, 2024) (Meier, 2024)