Proper Use of Hand Tools, Power Tools, and Bonding Agents

HAND TOOLS

There are several hand tools that are commonly used in technological problem solving, and each requires that students learn to use them safely and effectively. Appropriate PPE should always be worn and loose clothing, hair, and jewellery should be secured. **Table 4.5** lists some common hand tools.

Table 4.5 — Hand Tools

Tool	*Uses*	*Tips for Safe Use*
Mitre box or bench hook 	• holds wood securely while it is being cut or drilled • provides increased safety by securing work • allows students to keep their free hand away from a saw or drill bit	• Clamp mitre box securely to table using a C or F clamp. • Wood should fit securely into the holder on the mitre box. • Mitre box has guides for making cuts at different angles. If these guides are worn, the mitre box should be replaced.
C or F clamps 	• to secure equipment or work to a work surface (e.g., table top) • to join two pieces of material, e.g., to let glue dry	• Place the object or objects to be clamped on a flat, stable work surface. • Place the clamp so that all objects/surfaces to be clamped are between the pressure pads of the clamp. • Slowly turn the handle of the clamp screw until the pressure pads secure the materials with the desired force. • To avoid damage to the materials being clamped or to the surface to which materials are being clamped, do not over-tighten the clamp. • Keep fingers away from pressure pads as the clamp is being tightened.
Saws (e.g. junior hacksaws*) 	• cutting small wood (e.g., balsa)	• Ensure that the blade of the saw is straight, and the teeth are sharp and undamaged. • Remove screws and nails from old material before cutting. • Fasten the work securely with clamps before cutting. • Keep hands away from the teeth of the blade. • When completing a cut, support the waste side to prevent wood from falling. • Carry the saw with the toe (the end away from the handle) toward the floor.
Hand drill 	• drilling holes for axles, dowelling, pilot holes, or fulcrums	• Use pistol-grip hand drills that have no open gears. • Fasten the work securely with clamps before drilling. • Ensure that the bit is centred in the chuck and tightened before operating the drill. • Before drilling into slippery materials, place masking tape over the intended drilling location, or mark the spot with an awl, if available. • Never drill through cloth or other soft materials that will twist around the bit.

* Junior hacksaws are ideal for use with primary (1–3) and junior (4–6) grades.