

Power Drill/Driver

v3, Updated April 2021

Identify:

Trigger, chuck, battery, direction button, clutch and speed settings, various drill and screw bits (notice X drive shape in screw bits, aka Phillips head)

Accompanying Tools:

Goggles, clamps, pencil, bits, spade bits, screws

Safety:

- Use goggles, long hair should be tied back.
- Non-dominant hand goes on the back of the drill whenever it's in use, *never* near the bit.
- Enforcing proper clamping keeps students from attempting to hold materials rather than having proper hand placement.
- Requires room-level adult supervision after students are fully trained.
- Drill straight in and straight out to avoid snapping delicate drill bits.
- Lay the drill on its side when not in use, do not stand it up.

Operation:

- Identify depth of the material, compare depth to the drill bit and/or screw length.
- Clamp the material down, with a protective layer between the material and table if necessary.
- Make a dot or X where the hole will be drilled.
- Insert correct bit.
- Check direction button. The arrow that is pushed in identifies direction. Righty tighty, lefty loosey.
- Hold grip with dominant (drawing) hand, other hand presses from butt of drill.
- Position body in a standing position with shoulder above tool.
- Pull the trigger gently and control the speed. Press straight in with your non-dominant hand, using body weight to help push.
- Do not let go of drill while the bit is in wood.
- Control the tool, brace handle against your body if needed.
- Avoiding wiggling drill while bit is in wood.
- Press first the reverse switch, then the trigger to back out the bit after the desired depth is achieved.
- Friction can cause overheating of the drill bit. Be careful of a hot bit and allow it to cool for 10-15 seconds before touching.



Drilling Holes:

- Set speed switch to 2.
- Use the correct size drill bit.
- It is sometimes possible to remove a drill bit from a hole without switching the direction button, but it is a good habit as large drill bits *will* require this.
- Place drill in “drill” mode (symbol of a drill bit next to the clutch numbers).
- Predrill holes for efficient screw placement, ease of starting the screw, and to prevent splitting wood.

Putting in Screws:

- Set speed switch to 1 for more control.
- Check the length of the screw against the side of the material. Is it the right size to connect them?
- Make a pilot hole first with the appropriate bit.
- Insert screw bit into the chuck and tighten.
- Insert screw into pilot hole and twist with fingers until finger-tight. Move both hands onto drill.
- Match screw drive to bit.
- Squeeze the trigger gently and press with your non-dominant hand. Going slow and squeezing in brief pulses gives better control. *Light on the finger, hard on top.*
- If the bit keeps “chattering” and jumping out of the screw drive, stop and readjust, making sure you're pushing hard enough and that the drill or driver is in line with the screw.
- To remove a screw, change the direction button, and push down with non-dominant hand as the screw backs out.

Impact Driver:

- Uses only hex impact bits. Primarily used for putting in screws.
- Is louder and has more torque. Good for longer screws that are difficult to insert.
- Bits are held by a collet instead of a chuck. Pull the collet outwards, put in bit, release collet.

Regarding spade bits:

- This type of bit requires a lot of strength to maintain the drill position, particularly if the bits have a screw tip. As soon as the spade engages with the material, the drill itself will try to spin, and if you don't have a good grip on it, or have it braced against your body, the drill will spin around and hit your hands. Smaller tinkerers may need help to drill these types of holes, or you can set it up on a drill press.

