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**Republic of Angola**

**Ministry of Education**

**Industrial Polytechnic Institute of Luanda**

Topic: **Hand tools and power tools**

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**INTRODUCTION**

Tool

A tool is an object used to extend the ability of an individual to modify features of the surrounding environment Although many animals use simple tools, only human beings, whose use of stone tools dates back hundreds of millennia, have been observed using tools to make other tools.

A hand tool is any [tool](https://en.wikipedia.org/wiki/Tool" \o "Tool) that is powered [by hand](https://en.wikipedia.org/wiki/Manual_labour" \o "Manual labour) rather than a motor. Categories of hand tools include [wrenches](https://en.wikipedia.org/wiki/Wrenches" \o "Wrenches), [pliers](https://en.wikipedia.org/wiki/Pliers" \o "Pliers), [cutters](https://en.wikipedia.org/wiki/Cutter_(disambiguation)" \o "Cutter (disambiguation)), [files](https://en.wikipedia.org/wiki/File_(tool)), [striking tools](https://en.wikipedia.org/wiki/Hammer" \o "Hammer), [struck or hammered tools](https://en.wikipedia.org/wiki/Chisel" \o "Chisel), [screwdrivers](https://en.wikipedia.org/wiki/Screwdriver" \o "Screwdriver), [vises](https://en.wikipedia.org/wiki/Vises), [clamps](https://en.wikipedia.org/wiki/Clamp_(tool)" \o "Clamp (tool)), [snips](https://en.wikipedia.org/wiki/Snips" \o "Snips), [hacksaws](https://en.wikipedia.org/wiki/Hacksaws" \o "Hacksaws), [drills](https://en.wikipedia.org/wiki/Drills" \o "Drills), and [knives](https://en.wikipedia.org/wiki/Knives" \o "Knives).

Outdoor tools such as [garden forks](https://en.wikipedia.org/wiki/Garden_fork" \o "Garden fork), [pruning shears](https://en.wikipedia.org/wiki/Pruning_shears" \o "Pruning shears), and [rakes](https://en.wikipedia.org/wiki/Rake_(tool)" \o "Rake (tool)) are additional forms of hand tools. Portable [power tools](https://en.wikipedia.org/wiki/Power_tool" \o "Power tool) are not hand tools.

Hand tools have been used by humans since the [Stone Age](https://en.wikipedia.org/wiki/Stone_Age) when stones were used for hammering and cutting. During the [Bronze Age](https://en.wikipedia.org/wiki/Bronze_Age) tools were made by [casting](https://en.wikipedia.org/wiki/Casting) the [copper](https://en.wikipedia.org/wiki/Copper" \o "Copper) and [tin](https://en.wikipedia.org/wiki/Tin" \o "Tin) [alloys](https://en.wikipedia.org/wiki/Alloy" \o "Alloy). Bronze tools were sharper and harder than those made of stone. During the [Iron Age](https://en.wikipedia.org/wiki/Iron_Age" \o "Iron Age) [iron](https://en.wikipedia.org/wiki/Iron" \o "Iron) replaced bronze, and tools became even stronger and more durable. The [Romans](https://en.wikipedia.org/wiki/Ancient_Rome" \o "Ancient Rome) developed tools during this period which are similar to those being produced today. In the period since the [industrial revolution](https://en.wikipedia.org/wiki/Industrial_revolution), the manufacture of tools has transitioned from being craftsman made to being factory produced.

A large collection of British hand tools dating from 1700 to 1950 is held by [St Albans Museums](https://en.wikipedia.org/w/index.php?title=St_Albans_Museum&action=edit&redlink=1). Most of the tools were collected by [Raphael Salaman](https://en.wikipedia.org/wiki/Raphael_Salaman) (1906–1993), who wrote two classic works on the subject: Dictionary of Woodworking Tools and Dictionary of Leather-working Tools. [David Russell](https://en.wikipedia.org/wiki/David_R._Russell)'s vast collection of Western hand tools from the Stone Age to the twentieth century led to the publication of his book [Antique Woodworking Tools](https://en.wikipedia.org/wiki/Antique_Woodworking_Tools).

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| **Describing tools (Hand and Power tools)** | | | |
| **Name** | **Tipe** | **Description** | **Picture** |
| Wrench | Hand tools | A wrench or spanner is a [tool](https://en.wikipedia.org/wiki/Tool" \o "Tool) used to provide grip and [mechanical advantage](https://en.wikipedia.org/wiki/Mechanical_advantage" \o "Mechanical advantage) in applying [torque](https://en.wikipedia.org/wiki/Torque) to turn objects—usually rotary [fasteners](https://en.wikipedia.org/wiki/Fastener" \o "Fastener), such as [nuts](https://en.wikipedia.org/wiki/Nut_(hardware)" \o "Nut (hardware)) and [bolts](https://en.wikipedia.org/wiki/Screw" \o "Screw)—or keep them from turning.  In the [UK](https://en.wikipedia.org/wiki/United_Kingdom), [Ireland](https://en.wikipedia.org/wiki/Ireland" \o "Ireland), [Australia](https://en.wikipedia.org/wiki/Australia" \o "Australia), and [New Zealand](https://en.wikipedia.org/wiki/New_Zealand) spanner is the standard term | C:\Users\Ivandro Ngunuca\Downloads\Gedore_No._7_combination_wrenches_6–19_mm.jpg |
| Torque | Hand tools | In [physics](https://en.wikipedia.org/wiki/Physics" \o "Physics) and [mechanics](https://en.wikipedia.org/wiki/Mechanics" \o "Mechanics), torque is the rotational equivalent of linear [force](https://en.wikipedia.org/wiki/Force).[[1]](https://en.wikipedia.org/wiki/Torque#cite_note-1) It is also referred to as the moment of force (also abbreviated to moment). It represents the capability of a force to produce change in the rotational motion of the body. The concept originated with the studies | C:\Users\Ivandro Ngunuca\Downloads\Torque_animation.gif |
| Pliers | Hand tools | Pliers are a [hand tool](https://en.wikipedia.org/wiki/Hand_tool" \o "Hand tool) used to hold objects firmly, possibly developed from [tongs](https://en.wikipedia.org/wiki/Tongs" \o "Tongs) used to handle hot metal in [Bronze Age](https://en.wikipedia.org/wiki/Bronze_Age) Europe.[[1]](https://en.wikipedia.org/wiki/Pliers#cite_note-EB-1) They are also useful for [bending](https://en.wikipedia.org/wiki/Bending" \o "Bending) and [physically compressing](https://en.wikipedia.org/wiki/Compression_(physical)" \o "Compression (physical)) a wide range of materials | C:\Users\Ivandro Ngunuca\Downloads\1024px-Tool-pliers.jpg |
| Wire stripper | Hand tools | A wire stripper is a small, hand-held device used to strip the [electrical insulation](https://en.wikipedia.org/wiki/Electrical_insulation" \o "Electrical insulation) from electric [wires](https://en.wikipedia.org/wiki/Wire" \o "Wire). | C:\Users\Ivandro Ngunuca\Downloads\Tool_1530843.jpg |
| Diagonal pliers | Hand tools | Diagonal pliers (also known as wire cutters, diagonal cutting pliers, diagonal cutters, side cutters, dikes or Nippy cutters) are [pliers](https://en.wikipedia.org/wiki/Pliers" \o "Pliers) intended for the [cutting](https://en.wikipedia.org/wiki/Cutting" \o "Cutting) of [wire](https://en.wikipedia.org/wiki/Wire" \o "Wire) (they are generally not used to grab or turn anything). The plane defined by the cutting edges of the jaws intersects the joint rivet at an angle or "on a diagonal", hence the name. | C:\Users\Ivandro Ngunuca\Downloads\220px-Side_cutters.jpg |
| Scissors | Hand tools | Scissors are hand-operated shearing tools. A pair of scissors consists of a pair of [metal](https://en.wikipedia.org/wiki/Metal) [blades](https://en.wikipedia.org/wiki/Blade" \o "Blade) pivoted so that the sharpened edges slide against each other when the handles (bows) opposite to the pivot are closed. Scissors are used for cutting various thin materials, such as [paper](https://en.wikipedia.org/wiki/Paper" \o "Paper), [cardboard](https://en.wikipedia.org/wiki/Paperboard" \o "Paperboard), [metal foil](https://en.wikipedia.org/wiki/Metal_leaf), [cloth](https://en.wikipedia.org/wiki/Cloth" \o "Cloth), [rope](https://en.wikipedia.org/wiki/Rope" \o "Rope), and [wire](https://en.wikipedia.org/wiki/Wire" \o "Wire) | C:\Users\Ivandro Ngunuca\Downloads\Standard_household_scissors.jpg |
| Locking pliers | Hand tools | Locking pliers (also called Vise-Grips, a vice grip, Mole wrench or mole grips) are [pliers](https://en.wikipedia.org/wiki/Pliers" \o "Pliers) that can be locked into position, using an "over-center" [cam](https://en.wikipedia.org/wiki/Cam" \o "Cam) action | C:\Users\Ivandro Ngunuca\Downloads\220px-Locking_pliers.jpg |
| Round-nose pliers | Hand tools | Round nose pliers, often called rosary pliers in the jewelry trade, are a specialized type of [pliers](https://en.wikipedia.org/wiki/Pliers" \o "Pliers) characterized by their jaws of approximately round cross-section, usually of smooth surface finish and diameter tapering toward the tips | C:\Users\Ivandro Ngunuca\Downloads\Alicate_boca_redonda.png |
| Tongue-and-groove pliers | Hand tools | Tongue-and-groove pliers are a type of [slip-joint pliers](https://en.wikipedia.org/wiki/Slip-joint_pliers). They are also known as:   * adjustable pliers, * Channellocks ([i.e.](https://en.wiktionary.org/wiki/i.e.#Abbreviation), [Channellock](https://en.wikipedia.org/wiki/Channellock" \o "Channellock) brand pliers), * water pump pliers, * groove-joint pliers, * arc-joint pliers, * Multi-Grips, * tap or pipe spanners, * swan neck pliers. * Monkey pliers. | C:\Users\Ivandro Ngunuca\Downloads\220px-WaPuZa_Rothenberger_03.jpg |
| Modular connector | Hand tools | A modular connector is a type of [electrical connector](https://en.wikipedia.org/wiki/Electrical_connector" \o "Electrical connector) for cords and cables of electronic devices and appliances, such as in [computer networking](https://en.wikipedia.org/wiki/Computer_network" \o "Computer network), telecommunication equipment, and audio headsets.  Modular connectors were originally developed for use on specific [Bell System](https://en.wikipedia.org/wiki/Bell_System) telephone sets in the 1960s, and similar types found use for simple interconnection of customer-provided telephone subscriber premises equipment to the telephone network. | C:\Users\Ivandro Ngunuca\Downloads\220px-Rjxx.jpg |
| Hedge trimmer | Hand tools | A hedge trimmer, shrub trimmer, or bush trimmer[[1]](https://en.wikipedia.org/wiki/Hedge_trimmer" \l "cite_note-1) is a [gardening tool](https://en.wikipedia.org/wiki/Garden_tool" \o "Garden tool) or machine used for trimming (cutting, [pruning](https://en.wikipedia.org/wiki/Pruning" \o "Pruning)) [hedges](https://en.wikipedia.org/wiki/Hedge" \o "Hedge) or solitary [shrubs](https://en.wikipedia.org/wiki/Shrub" \o "Shrub) (bushes). Different designs as well as manual and powered versions of hedge trimmers exist. |  |
| Bolt cutter | Hand tools | A bolt cutter, sometimes called bolt cropper, is a tool used for cutting [bolts](https://en.wikipedia.org/wiki/Screw" \o "Screw), [chains](https://en.wikipedia.org/wiki/Chain" \o "Chain), [padlocks](https://en.wikipedia.org/wiki/Padlock" \o "Padlock), [rebar](https://en.wikipedia.org/wiki/Rebar) and wire mesh. It typically has long handles and short blades, with compound hinges to maximize [leverage](https://en.wikipedia.org/wiki/Lever" \o "Lever) and cutting force. |  |
| Air compressor | Power tools | An air compressor is a [pneumatic](https://en.wikipedia.org/wiki/Pneumatics" \o "Pneumatics) device that [converts power](https://en.wikipedia.org/wiki/Energy_conversion" \o "Energy conversion) (using an [electric motor](https://en.wikipedia.org/wiki/Electric_motor" \o "Electric motor), [diesel](https://en.wikipedia.org/wiki/Diesel_engine) or [gasoline engine](https://en.wikipedia.org/wiki/Gasoline_engine" \o "Gasoline engine), etc.) into [potential energy](https://en.wikipedia.org/wiki/Potential_energy" \o "Potential energy) stored in pressurized air (i.e., [compressed air](https://en.wikipedia.org/wiki/Compressed_air" \o "Compressed air)). By one of several methods, an air compressor forces more and more air into a storage tank, increasing the pressure. |  |
| Angle grinder | Power tools | An angle grinder, also known as a side grinder or disc grinder, is a handheld [power tool](https://en.wikipedia.org/wiki/Power_tool" \o "Power tool) used for [grinding (abrasive cutting)](https://en.wikipedia.org/wiki/Grinding_(abrasive_cutting)" \o "Grinding (abrasive cutting)) and [polishing](https://en.wikipedia.org/wiki/Polishing" \o "Polishing). Although developed originally as tools for rigid abrasive discs, the availability of an interchangeable power source has encouraged their use with a wide variety of cutters and attachments.  Angle grinders can be powered by an [electric motor](https://en.wikipedia.org/wiki/Electric_motor" \o "Electric motor) or [compressed air](https://en.wikipedia.org/wiki/Compressed_air" \o "Compressed air). |  |
| bandsaw | Power tools | A bandsaw (also written band saw) is a power [saw](https://en.wikipedia.org/wiki/Saw" \o "Saw) with a long, sharp [blade](https://en.wikipedia.org/wiki/Blade" \o "Blade) consisting of a continuous band of toothed metal stretched between two or more wheels to cut material. They are used principally in [woodworking](https://en.wikipedia.org/wiki/Woodworking" \o "Woodworking), [metalworking](https://en.wikipedia.org/wiki/Metalworking" \o "Metalworking), and [lumbering](https://en.wikipedia.org/wiki/Lumbering" \o "Lumbering), but may cut a variety of materials. |  |

### 1. Screwdriver

Screwdrivers allow mechanics to insert a screw into an object by turning its top, called a head. These are common tools for automobile mechanics, as they allow you to connect one part of a machine to another. As screws often have different groove shapes in the heads, it's often helpful to use a screwdriver set that can fit different types. For example, one type has a flat edge while another has small metal prongs set in the shape of a plus sign.

### 3. Torque wrench

A torque wrench is often longer than a typical wrench tool, meaning it allows mechanics to apply a larger amount of force to a bolt or nut. Professionals often use this tool to tighten nuts and bolts in high-density objects, as exerting high levels of force can allow them to increase the number of turns a wrench can make. Mechanics can often adjust a torque wrench's length settings. As a result, they can better ensure they're exerting the correct amount of force and can tighten a screw effectively.

### 5. Ratchet and socket set

Ratchet and socket sets are like wrenches, as you can use them to tighten or loosen nuts and bolts. With this tool, a socket of the right size goes over the head of the bolt or nut. The other end of the socket then attaches to the ratchet, allowing a user to fasten the screw. Ratchets allow you to manipulate objects by moving a hand back and forth on the handle, rather than rotating the tool in a full circle. As a result, you may secure screws more easily when building vehicles or planes.

### 6. Spark plug gapper

To fire correctly, the center of a spark plug must be a specific distance from the side electrodes. Mechanics easily measure this distance by applying a spark plug gapper, which is a round metal coin-shaped object with grooves indicating measurements. Some tools often have an attachment made of coiled metal that allows you to widen or lessen the gap. To use this tool, mechanics can slide it in the gap on the spark plug and turn the object until they reach the right distance. By using it, you can better ensure accurate spark plug installations and enhance a company's safety standards.

### 7. Oil filter wrench

An oil filter wrench is a tool designed specifically to help vehicle mechanics with oil changes. This tool is circular so it can fit directly onto the oil filter, allowing you to manipulate the device and remove it more easily. Since oil changes are very common procedures for vehicles, knowing how to use this tool can enhance your job performance and help streamline your work efforts.

**References**

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