




# Electrical Components Chooser Charts

You can use this chart to help you decide which components to use in your design.

| <b>Batteries</b> suitable for low-voltage direct current devices                                                                                           |                                                                                                          |                                                                                                                   |                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| non-rechargeable zinc-carbon for low current, infrequent use e.g. torch or calculator.                                                                     | non-rechargeable zinc-chloride for medium current, regular use e.g. hand-held computer game              | non-rechargeable alkaline for high current, heavy use e.g. Walkman or radio-controlled model                      | rechargeable nickel-cadmium for prolonged use e.g. laptop computer or mobile phone |
| low cost                                                                                                                                                   | medium cost                                                                                              | medium cost                                                                                                       | high cost                                                                          |
| <b>Cables</b> suitable for internal wiring of electrical and electronic instruments                                                                        |                                                                                                          |                                                                                                                   |                                                                                    |
| multistrand cooper wire covered in PVC, available in black, blue, brown, green, grey, orange, pink, red, violet, white, yellow                             | twin figure 8 black, brown, grey, white                                                                  | ribbon cable covered in grey PVC or colour coded wide variety available e.g. 14-way, 15-way, 16-way, 20-way, etc. |                                                                                    |
| Ensure that wire can carry the required current                                                                                                            |                                                                                                          |                                                                                                                   |                                                                                    |
| low cost                                                                                                                                                   | low cost                                                                                                 | high cost                                                                                                         |                                                                                    |
| <b>Connectors</b> for joining wires and components                                                                                                         |                                                                                                          |                                                                                                                   |                                                                                    |
| terminal blocks for permanent connection without soldering; take care wiring is not under strain; vibration can loosen the connection                      | crocodile clips for rapid temporary connection, suitable for test circuits only                          | solder for permanent connection take care wiring is not under strain                                              |                                                                                    |
| low cost                                                                                                                                                   | medium cost                                                                                              | low cost                                                                                                          |                                                                                    |
| <b>Cable fixings</b> used to keep wiring neat and tidy                                                                                                     |                                                                                                          |                                                                                                                   |                                                                                    |
| ties                                                                                                                                                       | grips                                                                                                    | conduit                                                                                                           |                                                                                    |
| low cost                                                                                                                                                   | low cost                                                                                                 | medium cost                                                                                                       |                                                                                    |
| <b>Lamps</b> used to provide illumination                               |                                                                                                          |                                                                                                                   |                                                                                    |
| Ensure that that lamp matches the power source to avoid burning out. Use the appropriate fitting                                                           |                                                                                                          |                                                                                                                   |                                                                                    |
| filament                                                                                                                                                   |                                                                                                          | tungsten halogen                                                                                                  |                                                                                    |
| low cost                                                                                                                                                   |                                                                                                          | medium cost                                                                                                       |                                                                                    |
| <b>Resistors</b> for controlling the size of electrical current and potential difference                                                                   |                                                                                                          |                                                                                                                   |                                                                                    |
| Fixed resistors                                                         | variable resistors  |                                                                                                                   |                                                                                    |
| values shown by the colour code:<br>black 0      brown 1<br>red 2        orange 3<br>yellow 4     green 5<br>blue 6       violet 7<br>grey 8       white 9 |                                                                                                          | presets adjusted with a screwdriver<br>potentiometers adjusted with fingers                                       |                                                                                    |
| Ensure correct power rating to prevent overheating                                                                                                         |                                                                                                          |                                                                                                                   |                                                                                    |
| available in a range of preferred values from 10Ω to 10 MΩ                                                                                                 |                                                                                                          | available in a range of preferred values from 100Ω to 1MΩ                                                         |                                                                                    |
| low cost                                                                                                                                                   |                                                                                                          | medium cost                                                                                                       |                                                                                    |

## Electrical Components Chooser Charts (cont'd)

| <b>Light-emitting diodes (LEDs)</b> for giving out small visible signs                   |                                                                                                                           |                                                                                                                              |                              |
|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| non-flashing                                                                             | flashing                                                                                                                  |                                                                                                                              |                              |
| standard, high intensity and ultra bright in red, yellow and green                       | standard and ultra bright in red                                                                                          |                                                                                                                              |                              |
| available as ▲ and ● shapes                                                              | available as ● shape only                                                                                                 |                                                                                                                              |                              |
| needs protective resistor                                                                | does not need protective resistor                                                                                         |                                                                                                                              |                              |
| must be connected correct way round                                                      | must be connected correct way round                                                                                       |                                                                                                                              |                              |
| low cost                                                                                 | medium cost                                                                                                               |                                                                                                                              |                              |
| <b>Motors</b>                                                                            |                                                                                                                           |                                                                                                                              |                              |
| very light duty<br>no built-in gears<br>for lightweight applications<br>e.g. moving toys | light duty<br>with built-in nylon gears<br>medium weight applications<br>e.g. automata, rotating signs,<br>point of sales | medium duty<br>with built-in steel gears<br>medium weight applications for<br>prolonged use<br>e.g. testing equipment, pumps |                              |
| low cost                                                                                 | medium cost                                                                                                               | high cost                                                                                                                    |                              |
| <b>Noise makers</b>                                                                      |                                                                                                                           |                                                                                                                              |                              |
| buzzers                                                                                  | bells                                                                                                                     |                                                                                                                              |                              |
| must be connected correct way round                                                      | can be connected either way                                                                                               |                                                                                                                              |                              |
| must match power source to prevent burning out                                           |                                                                                                                           |                                                                                                                              |                              |
| low cost                                                                                 | medium cost                                                                                                               |                                                                                                                              |                              |
| <b>Switches (general)</b>                                                                |                                                                                                                           |                                                                                                                              |                              |
| available as push button, slide, toggle and rocker                                       |                                                                                                                           |                                                                                                                              |                              |
| to hold something on or off                                                              | to set something on or off                                                                                                | to turn something on and something else off                                                                                  | to reverse direction         |
| push-to-make<br>push-to-break                                                            | single pole/<br>single throw                                                                                              | single pole/<br>double throw                                                                                                 | double pole/<br>double throw |
| low cost                                                                                 | low cost                                                                                                                  | medium cost                                                                                                                  | medium cost                  |
| <b>Switches (specialist)</b>                                                             |                                                                                                                           |                                                                                                                              |                              |
| micro-switches                                                                           | available as button, roller or lever                                                                                      | medium cost                                                                                                                  |                              |
| tilt switch                                                                              | operated by vibration or change in position                                                                               | low cost                                                                                                                     |                              |
| reed switch                                                                              | operated by a magnet                                                                                                      | low cost                                                                                                                     |                              |