

# READING COMPREHENSION

## *What is a Multimeter?*



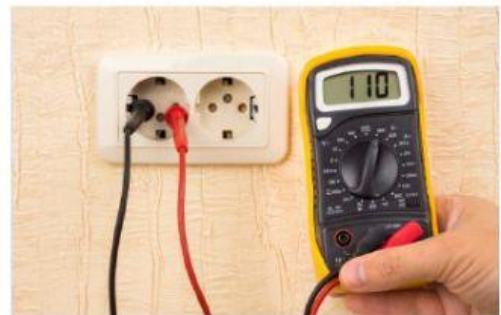
A multimeter is an electric testing tool that all electricians, engineers or even DIY enthusiasts should have in their toolbox. Why? Because it is very useful. This electronic device combines various measurement functions in a single unit. It can measure multiple electrical values... Hence the name, multi-meter!

A basic multimeter measures AC/DC voltage, current and resistance. Advanced multimeter models have additional testing and measuring capacities, for example continuity (electrical connection), capacitance, inductance and temperature.

The multimeter is a standard diagnostic tool for technicians in the electrical and electronic industries. With it, you can troubleshoot electrical issues and pinpoint a problem in a circuit. You can test the voltage of live wires in house electrical wiring, and check if batteries and electronic components such as diodes, transistors and capacitors function properly.

### **Main parts of a multimeter**

Multimeters have fragile **electronic circuits** inside **protective hard casing**. Handheld multimeters require a **battery** to measure resistance and to display the readings or values on a digital screen.



The **face of a multimeter** typically includes:

- **Display.** Where measurement readouts can be viewed. Some multimeters have illuminated displays for better viewing in low light situations.
- **Selection Knob.** You rotate it to select primary measurement values (volts, amps, ohms).
- **Buttons.** You press them to select extra functions, which are only available in some multimeter models.
- **Input Jacks/Ports.** Where **Test Leads** are inserted. The number of ports and their arrangement also vary depending on the multimeter model.

**Test leads** are flexible, **insulated wires** (red for positive, black for negative) that have a banana type connector on the end that plugs into the multimeter. The **Probe Tips** on each lead are used for creating temporary connections when testing circuits. There are many different types of probes available for multimeters, for example:

- **Banana Plug to Simple Test Probes.** Every multimeter comes with these probes.
- **Banana Plug to Alligator Clips.** They can be left clipped, which frees up the user's hands for other tasks.
- **Banana Plug to Tweezers.** They are used to measure SMD components on electronic circuit boards.
- **Banana to IC Hook Cables.** They grab onto wires, leads, and pins of electronic parts on circuit boards.



### What makes a good multimeter?

Multimeters vary in **size, accuracy and measuring range**. They can be **portable handheld devices or highly-precise bench instruments**. Laboratory-grade models with certified calibration cost thousands of euros, while the most basic, cheapest models can cost less than ten euros.

Multimeters are divided into **two types** depending on the way the indication is displayed: **analog (UK: analogue) and digital**. Needle-based **analog multimeters (AMMs)** are usually cheaper, more physically robust and responsive than **digital multimeters (DMMs)**. However, DMMs measure more accurately than AMMs and are easier to read. What is more, high quality DMMs often include **additional advanced features or options**, and can be **connected to a computer or telephone** to log data and display graphs. **Auto-off, auto-polarity and auto-ranging** are extra features that make multimeters more user-friendly.

Obviously, multimeters with many features are more expensive than basic ones. So... What type of multimeter should you buy? Well, it depends on what you will use it for, and the amount of money you are willing to pay. You should choose the multimeter model that best suits your needs and budget.

## QUESTIONNAIRE:

**Activity 1.** Read the text and say if the sentences are **True, False** or **Not said/Not mentioned**.

- a) The name “Multimeter” means that the device has multiple measurement tools.
- b) Multimeters do not require calibration.
- c) High quality multimeter models are built to last and have lifetime warranty.
- d) Multimeters can only measure voltage, current and resistance.
- e) You can diagnose problems in an electronic circuit with a multimeter.
- f) All multimeters are expensive.
- g) All multimeters are handheld.
- h) Multimeters have electronic circuits inside.
- i) A clamp meter is a type of multimeter.
- j) To measure resistance, multimeters require a source of electric power, for example a battery.
- k) There are digital and analog multimeter models.
- l) Digital multimeters are more robust.
- m) You can connect an analog multimeter to a computer to log data and display graphs.
- n) Test leads create temporary connections between the multimeter and an electric circuit or component.
- o) Test leads have insulated probe tips.



**Activity 2.** Identify the Analog Multimeter (AMM) and the Digital Multimeter (DMM) in the picture.



**Activity 3.** Identify the Multimeter parts and components in the picture (write the number next to the name or expression).

- Probe Tips
- Display
- Buttons
- Input jacks/Ports
- Test Leads
- Selection Knob

