**Тема:** «Элементы цепи. Резисторы»

**Цель:** Повторить грамматический материал по теме, продолжить изучать глоссарий по теме проф.блока «элементы цепи».

**Задачи:** Отработать навык работы (в т.ч. перевода) с профессиональной лексикой по теме профессионального блока, повторить тематический материал, актуализировать имеющиеся знания.

**Специальность:** ОГСЭ.03

**Время выполнения:** 90 минут

1. **Study the glossary.**
2. **Read the text.**
3. **Learn the rule (if any).**
4. **Do the tasks.**

**Take a Stance, The Resist Stance\***

*Resistors - the most ubiquitous of electronic components. They are a critical piece in just about every circuit. And they play a major role in our favorite equation,*[*Ohm's Law*](https://learn.sparkfun.com/tutorials/voltage-current-resistance-and-ohms-law/ohms-law)*.*

**Resistor Basics**

Resistors are electronic components which have a specific, never-changing [electrical resistance](https://learn.sparkfun.com/tutorials/voltage-current-resistance-and-ohms-law/resistance). The resistor's resistance **limits off the electrons**  **flow** through a circuit. They are **passive** components, meaning they only consume power (and can't generate it). Resistors are usually added to circuits where they complement **active** components like op-amps, microcontrollers, and other [integrated circuits](https://learn.sparkfun.com/tutorials/integrated-circuits). Commonly resistors are used to limit current, [divide voltages](https://learn.sparkfun.com/tutorials/voltage-dividers), and [pull-up I/O lines](https://learn.sparkfun.com/tutorials/pull-up-resistors).

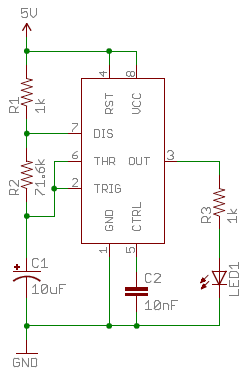
**Resistor units**

*The electrical resistance of a resistor is measured in****ohms****. The symbol for an Ohm is the greek capital-omega: Ω. The (somewhat roundabout) definition of 1Ω is the resistance between two points where 1 volt (1V) of applied potential energy will push 1 ampere (1A) of current.* As [SI units](https://learn.sparkfun.com/tutorials/metric-prefixes-and-si-units) go, larger or smaller values of ohms can be matched with a prefix like kilo-, mega-, or giga-, to make large values easier to read. It's very common to see resistors in the kilohm (kΩ) and megaohm (MΩ) range (much less common to see miliohm (mΩ) resistors). For example, a 4,700Ω resistor is equivalent to a 4.7kΩ resistor, and a 5,600,000Ω resistor can be written as 5,600kΩ or (more commonly as) 5.6MΩ.

**Schematic symbol**

*All resistors have****two terminals****, one connection on each end of the resistor.* When modeled on a schematic, a resistor will show up as one of these two symbols:

Two common resistor schematic symbols. R1 is an American-style 1kΩ resistor, and R2 is an international-style 47kΩ resistor.

The terminals of the resistor are each of the lines extending from the squiggle (or rectangle). Those are what connect to the rest of the circuit. The resistor circuit symbols are usually enhanced with both a resistance value and a name. *The value, displayed in ohms, is obviously critical for both evaluating and actually constructing the circuit.* The name of the resistor is usually an R preceding a number. Each resistor in a circuit should have a unique name/number. For example, here's a few resistors in action on a 555 timer circuit:

Resistors come in a variety of shapes and sizes. They might be through-hole or surface-mount. They might be a standard, static resistor, a pack of resistors, or a special variable resistor.

1. **Translate the lines given in italics into Russian.**
2. **Answer the following questions, use the text above:**
3. What is the function of a resistor?
4. What does “passive component” mean?
5. How are the resistor’s terminals situated?
6. Give the main types of resitors.
7. **Fill in the gaps with the following words:** constructed; material; film; **carbon.**

## Resistor Composition

## Resistors can be\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ out of a variety of materials. Most common, modern resistors are made of either a ****\_\_\_\_\_\_\_\_\_\_\_\_\_\_, metal, or metal-oxide film****. In these resistors, a thin \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of conductive (though still resistive) material is wrapped in a helix around and covered by an insulating\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Most of the standard, no-frills, through-hole resistors will come in a carbon-film or metal-film composition.

1. **Read and answer the following questions:**

### Four Band Resistors

### In the standard four band resistors, the first two bands indicate the ****two most-significant digits**** of the resistor's value. The third band is a weight value, which ****multiplies**** the two significant digits by a power of ten.

### The final band indicates the ****tolerance**** of the resistor. The tolerance explains how much more or less the actual resistance of the resistor can be compared to what its nominal value is. No resistor is made to perfection, and different manufacturing processes will result in better or worse tolerances. For example, a 1kΩ resistor with 5% tolerance could actually be anywhere between 0.95kΩ and 1.05kΩ.

### How do you tell which band is first and last? The last, tolerance band is often clearly separated from the value bands, and usually it'll either be silver or gold.

**Five and Six Band Resistors**

Five band resistors have a third significant digit band between the first two bands and the **multiplier band**. Five band resistors also have a wider range of tolerances available.

Six band resistors are basically five band resistors with an additional band at the end that indicates the temperature coefficient. This indicates the expected change in resistor value as the temperature changes in degrees Celsius. Generally these temperature coefficient values are extremely small, in the ppm range.

1. What is the difference between the **four band resistors** and five and **six band resistors**?
2. What is the five and six band resistors application?
3. Count the resistance of the picture below according to the calculator:

