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Государственное профессиональное образовательное учреждение
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**МЕТОДИЧЕСКОЕ ПОСОБИЕ
УЧЕБНОЙ ДИСЦИПЛИНЫ
ОГСЭ.03. ИНОСТРАННЫЙ ЯЗЫК В ПРОФЕССИОНАЛЬНОЙ
ДЕЯТЕЛЬНОСТИ (АНГЛИЙСКИЙ)**

образовательной программы среднего профессионального образования по
подготовке специалистов среднего звена по специальности

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- Учебного плана образовательной программы среднего профессионального образования по подготовке квалифицированных рабочих, служащих по специальности 08.02.09 Монтаж, наладка и эксплуатация электрооборудования промышленных и гражданских зданий;
- Методических материалов Института развития профессионального образования ФГБОУ ДПО ИРПО <http://spo-lab.ru/soospo>

Методическое пособие рассмотрено на заседании методической комиссии общеобразовательного цикла ГПОУ «Сосногорский технологический техникум». Протокол № 1 от 31 августа 2023 года

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Пояснительная записка

Предлагаемое учебное пособие предназначено для студентов 2-4 курса специальности 08.02.09. Монтаж, наладка и эксплуатация электрооборудования промышленных и гражданских зданий и разработано в соответствии с требованиями федерального государственного образовательного стандарта среднего профессионального образования и учебной программы курса английского языка.

Материал методической разработки способствует формированию навыков работы с иноязычными текстами, навыков перевода, извлечения информации и её переработки на основе различных видов чтения, расширение активного и пассивного словарного запаса в профессиональной области. Учебное пособие позволяет решать следующие *задачи* на уроке иностранного языка (английского):

1. совершенствование процесса качественного произношения слов;
2. введение и закрепление лексики;
3. работа над грамматикой;
4. совершенствование навыков устной речи.

Специальная лексика вводится тематически, закрепляется в разнообразных упражнениях. Разделы включают в себя следующие задания:

1. Работа с текстом (чтение, перевод, вывод лексики в речь и письмо)
2. Работа с разными типами вопросов по тематике текста;
3. Работа по подбору лексики на уровне темы;
4. Составление монологических и диалогических высказываний по теме.

Разработанные упражнения предназначены для организации адекватного понимания содержания текстов профессиональной направленности и умения анализировать речевую ситуацию.

Материалы, представленные в пособии, могут использоваться как в ходе самостоятельной работы обучающихся, так и на практических аудиторных занятиях под руководством преподавателя.

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UNIT 1

I. Read the text

THE NATURE OF ELECTRICITY

Practical electricity is produced by small atomic particles known as electrons. It is the movement of these particles which produce the effects of heat and light.

The pressure that forces these atomic particles to move, the effects they encounter opposition and how these forces are controlled are some of the principles of electricity.

Accepted atomic theory states that all matter is electrical in structure. Any object is largely composed of a combination of positive and negative particles of electricity. Electric current will pass through a wire, a body, or along a stream of water. It can be established in some substances more readily than in others, that all matter is composed of electric particles despite some basic differences in materials. The science of electricity then must begin with a study of the structure of matter. Matter is defined as any substance which has mass (or weight) and occupies space. This definition should be broad enough to cover all physical objects in the universe. Wood, water, iron, and paper are some examples of matter. Energy is closely related to, but not to be confused with, matter. Energy does not have mass, and it does not occupy space. Heat and light are examples of energy.

The smallest particle of matter which can be recognized as an original substance was thought to be a unit called the atom. Recently scientists have found particles even smaller than atoms, but our theories are still based on the atom. The atom consists of a nucleus and a cloud of electrons. It is generally agreed that the electrons are small particles of electricity, which are negative in nature. These particles orbit the nucleus in much the same fashion that planets orbit a sun.

II. Guess the meaning of the following international words:

Electricity Electron Effect Structure Combination Material Mass Energy Atom Orbit

III. Give the English equivalents for the words below:

- 1) производить
- 2) частица
- 3) тепло и свет
- 4) напряжение
- 5) сила
- 6) вещество
- 7) положительный
- 8) отрицательный
- 9) электрический ток
- 10) вес

11) ядро	
IV. Translate into Russian the words and expressions from the text:	
atomic particle	
effects of heat and light;	
encounter opposition;	
principles of electricity;	
composed (of);	
pass through a wire;	
occupy space;	
physical objects;	
a cloud of electrons;	
in the same fashion.	
V. Complete the sentences using the text:	
<ol style="list-style-type: none"> 1. Electricity is produced by ... 2. The effects of heat and light are produced by ... 3. According to the accepted atomic theory all matter is ... 4. Any object is composed of ... 5. Matter is defined as ... 6. Energy must not be confused with ... 7. The atom consists of ... 8. The smallest particle of matter is ... 9. Most theories are based on ... 10. Electrons are ... 	
VI. Answer the questions:	
<ol style="list-style-type: none"> 1) What are the principles of electricity? 2) What must the science of electricity begin with? 3) Are there any differences between energy and matter? What are they? 4) What is recognized as an original substance now? 	
VII. Topics for discussion:	
<ol style="list-style-type: none"> 1. The nature of electricity; 2. The nature of matter; 3. Contents of atomic theory. 	

UNIT 2

I. Read the text

ELECTRIC CURRENT

The electric current is a quantity of electrons flowing in a circuit per second of time. The unit of measure for current is ampere. If one coulomb passes a point in a circuit per second then the current strength is 1 ampere. The symbol for current is I.

The current which flows along wires consists of moving electrons. The electrons move along the circuit because the e .m. f. drives them. The current is directly proportional to the e. m. f.

In addition to traveling through solids, however, the electric current can flow through liquids as well and even through gases. In both cases it produces some most important effects to meet industrial requirements. Some liquids, such as melted metals for example, conduct current without any change to themselves. Others, called electrolytes, are found to change greatly when the current passes through them.

When the electrons flow in one direction only, the current is known to be d. c., that is, direct current. The simplest source of power for the direct current is a battery, for a battery pushes the electrons in the same direction all the time (i.e., from the negatively charged terminal to the positively charged terminal).

The letters a. c. stand for alternating current. The current under consideration flows first in one direction and then in the opposite one. The a. c. used for power and lighting purposes is assumed to go through 50 cycles in one second.

One of the great advantages of a. c. is the ease with which power at low voltage can be changed into an almost similar amount of power at high voltage and vice versa. Hence, on the one hand alternating voltage is increased when it is necessary for long-distance transmission and, on the other hand, one can decrease it to meet industrial requirements as well as to operate various devices at home.

Although there are numerous cases when d. c. is required, at least 90 per cent of electrical energy to be generated at present is a. c. In fact, it finds wide application for lighting, heating, industrial, and some other purposes.

II. Guess the meaning of the following international words:

Electric, ampere, symbol, proportional, industrial, metal, electrolyte, battery, generate.

III. Give the English equivalents for the words and word combinations below:

- 1) течь, протекать;
- 2) цепь, схема;
- 3) единица измерения;

- 4) провод;
- 5) электродвижущая сила;
- 6) твердое тело;
- 7) жидкость;
- 8) проводить (ток);
- 9) источник энергии;
- 10) постоянный ток;
- 11) переменный ток;
- 12) напряжение.

IV. Give Russian equivalents for the following:

- 1) to meet industrial requirements;
- 2) melted metals;
- 3) to push in the same direction;
- 4) negatively (positively) charged terminal;
- 5) power and lightning purposes;
- 6) long-distance transmission;
- 7) to operate devices;
- 8) to find wide application.

V. Say whether these sentences are true or false:

1. The symbol for current is I.
2. The electric current can flow only through liquids.
3. The current can be of two types: direct current and alternating current.
4. The alternating current flows in one direction.
5. A battery is the simplest source of power for the direct current.
6. Direct current finds wider application than alternating current.
7. Electrolytes don't change greatly when current passes through them.
8. One of the great advantages of alternating current is the ease with which voltage can be changed.

VI. Fill in the blanks, using the words from the box:

direct current, solids, conduct, electric current, liquids, voltage, alternating current

1. A quantity of moving electrons flowing in a circuit is the a) _____ .
2. The current can flow through b) _____ and c) _____ .
3. Some liquids d) _____ current without any change to themselves.
4. When the electrons flow in one direction only, the current is known to be e) _____ .

5. The current flowing first in one direction and then in the opposite one is f) _____.
6. Such advantage of alternating current as alternating g) _____ finds wide industrial and household application.

VII. State the questions to the underlined words:

1. *Melted metals* conduct current without any change to themselves.
2. Alternating voltage can be changed *to operate various devices at home*.
3. A battery pushes the *electrons* in the same direction.
4. *The alternating current* is used for power and lightning purposes.
5. Alternating current accounts for *90 per cent* of electrical energy generated now.

VIII. Say some sentences about the types of electric current and its properties

UNIT 3

I. Read the text

EFFECTS PRODUCED BY CURRENT

The current flow is detected and measured by any of the effects that it produces. There are three important effects accompanying the motion of electric charges: the heating, the magnetic, and chemical effects, the latter is manifested under special conditions.

The production of heat is perhaps the most familiar among the principal effects of an electric current. The heating effect of the current is found to occur in the electric circuit itself. It is detected owing to an increase in the temperature of the circuit. This effect represents a continual transformation of electric energy into heat. For instance, the current which flows through the filament of an incandescent lamp heats that filament to a high temperature.

The heat produced per second depends both upon the resistance of the conductor and upon the amount of current carried through it. The thinner the wire is, the greater the developed heat is. On the contrary, the larger the wire is, the more negligible the heat produced is. Heat is greatly desirable at times but at other times it represents a waste of useful energy. It is this waste that is generally called "heat loss" for it serves no useful purposes and decreases efficiency.

The heat developed in the electric circuit is of great practical importance for heating, lighting and other purposes. Owing to it people are provided with a large number of appliances, such as: electric lamps that light our homes, streets and factories, electrical heaters that are widely used to meet industrial requirements, and a hundred and one other necessary and irreplaceable things which have been serving mankind for so many years.

The electric current can manifest itself in some other way. It is the motion of

the electric charges that produces the magnetic forces. A conductor of any kind carrying an electric current, a magnetic field is set up about that conductor.

This effect exists always whenever an electric current flows, although in many cases it is so weak that one neglects it in dealing with the circuit. An electric charge at rest does not manifest any magnetic effect. The use of such a machine as the electric motor has become possible owing to the electromagnetic effect.

The last effect to be considered is the chemical one. The chemical effect is known to occur when an electric current flows through a liquid. Thanks to it a metal can be transferred from one part of the liquid to another. It may also effect chemical changes in the part of the circuit comprising the liquid and the two electrodes which are found in this liquid. Any of the above mentioned effects may be used for detecting and measuring current.

II. Give the English equivalents for the following words:

- | | |
|----------------------------|----------------------------------|
| 1. выявлять, обнаруживать; | 6. лампа накаливания; |
| 2. измерять; | 7. прибор; |
| 3. заряд; | 8. потеря энергии; |
| 4. нить накала; | 9. освещать; |
| 5. тепловой эффект; | 10. обнаруживаться, проявляться. |

III. Guess the meaning of the following international words:

transformation, temperature, chemical, magnetic, special, practical, motor, electrode.

IV. Insert words and expressions:

1. The current flow is (выявляется и измеряется) by any of the effects that it produces.
2. There are three important effects accompanying the motion of (электрические заряды).
3. The current which flows through the (нить накала лампы накаливания) heats that filament to a high temperature.
4. Heat represents (потерю полезной энергии) at times.
5. Electric lamps (освещать) our homes, streets and factories.
6. The electric current can (проявлять) magnetic effect.

V. Choose the correct translation:

The heating effect of the current is found to occur in the electric circuit itself.

1. Установлено, что тепловой эффект электрического тока обнаруживается в самой электрической цепи.

2. Тепловой эффект электрического тока может появляться в самой электрической цепи.
3. Установлено, что тепловой эффект электрического тока должен обнаруживаться в самой электрической цепи.

Когда в любом проводнике появляется электрический ток, вокруг него возникает магнитное поле.

1. A conductor of any kind carrying an electric current, a magnetic field was set up about that conductor.
2. A conductor of any kind have been carrying an electric current, a magnetic field is set up about that conductor.
3. A conductor of any kind carrying an electric current, a magnetic field is set up about that conductor.

Последний эффект, который необходимо рассмотреть – химический эффект.

1. The last effect is considered to be the chemical one.
2. The last effect to be considered is the chemical one.
3. The last effect would be considered the chemical one.

Известно, что химический эффект возникает, когда электрический ток проходит через жидкость.

1. The chemical effect is known to occur when an electric current flows through a liquid.
2. The chemical effect is famous to occur when an electric current flows through a liquid.
3. The chemical effect may be known to occur when an electric current flows through a liquid.

Именно движение электрических зарядов порождает магнитные силы.

1. The motion of the electric charges produces the magnetic forces.
2. It is the motion of the electric charges that produces the magnetic forces.
3. The motion of the electric charges is certain to produce the magnetic forces.

VI. Answer the questions:

1. What effects does the current flow produce?
2. How is the heating effect detected?
3. What does the heat produced depend upon?
4. What is called “heat loss”?
5. How is the magnetic effect set up?
6. What is the main condition of the magnetic effect existence?
7. When does the chemical effect occur?

VII. Speak about the principal effects of an electric current, using the text and chart above

UNIT 4

I. Read the text

ELECTRIC CURCUITS

The concepts of electric charge and potential are very important in the study of electric currents. When an extended conductor has different potentials at its ends, the free electrons of the conductor itself are caused to drift from one end to the other. The potential difference must be maintained by some electric source such as electrostatic generator or a battery or a direct current generator. The wire and the electric source together form an electric circuit, the electrons are drifting around it as long as the conducting path is maintained.

There are various kinds of electric circuits such as: open circuits, closed circuits, series circuits, parallel circuits and short circuits. To understand the difference between the following circuit connections is not difficult at all. If the circuit is broken or «opened» anywhere, the current is known to stop everywhere. The circuit is broken when an electric device is switched off. The path along which the electrons travel must be complete otherwise no electric power can be supplied from the source to the load. Thus the circuit is “closed” when an electric device is switched on.

When electrical devices are connected so that the current flows from one device to another, they are said «to be connected in series». Under such conditions the current flow is the same in all parts of the circuit as there is only a single path along which it may flow. The electrical bell circuit is considered to be a typical example of a series circuit. The “parallel” circuit provides two or more paths for the passage of current. The circuit is divided in such a way that part of the current flows through one path and part through another. The lamps in the houses are generally connected in parallel.

The “short” circuit is produced when the current can return to the source of supply without control. The short circuits often result from cable fault or wire fault. Under certain conditions the short circuit may cause fire because the current flows where it was not supposed to flow. If the current flow is too great a fuse is used as a safety device to stop the current flow.

II. Guess the meaning of the following international words:

concept, potential, electrostatic generator, aluminum, parallel, typical, control.

III. Give the English equivalents for the following words and word combinations:

<ol style="list-style-type: none"> 1) электрические цепи, 2) электрический заряд, 3) проводник, 4) сопротивление, 5) движение электронов, 6) изолятор, 7) короткое замыкание, 8) энергия. 	
IV. Say whether these sentences are true or false:	
<ol style="list-style-type: none"> 1. When an extended conductor has the same potential at its ends, free electrons are drifting from one end to another. 2. The wire and the electric source together form an electric circuit. 3. A path of any material will allow current to exist. 4. Silver, copper and gold oppose very strongly. 5. The slighter the opposition is, the better the insulator is. 6. There is only one type of electric circuit. 7. We close the circuit when we switch on our electric device. 	
V. Complete the sentences using the text:	
<ol style="list-style-type: none"> 1. The potential difference must be maintained by ... 2. Materials that offer slight opposition are called ... 3. The best insulators are ... 4. There are various kinds of electric circuits such as ... 5. We “open” the circuit when ... 6. We “close” the circuit when ... 7. The “short” circuit is produced when ... 8. A fuse is ... 	
VI. Answer the questions:	
<ol style="list-style-type: none"> 1. What concepts are very important in study of electric current? 2. What forms an electric circuit? 3. What materials are the best conductors and insulators? 4. What kinds of electric circuits do you know? 5. How can we open and close the circuit? 6. When are electrical devices connected in series? 7. What is an example of a series circuit? 8. What can you say about «parallel» circuits? 9. What does the short circuit often result from? 	
VII. Talk on the types of electric circuits	

UNIT 5

I. Read the text

ALTERNATING CURRENT

Current is defined as increment of electrons. The unit for measuring current was named in honor of A.M. Ampere, the French physicist. Thus it is called ampere. The symbol for current is I. The electric current is a quantity of electrons flowing in a circuit per second of time. The electrons move along the circuit because the e. m. f. drives them. The current is directly proportional to the e. m. f.

A stream of electrons in a circuit will develop a magnetic field around the conductor along which the electrons are moving. The strength of the magnetic field depends upon the current strength along the conductor. The direction of the field is dependent upon the direction of the current.

If the force causing the electron flow is indirect, the current is called direct (d. c.). If the force changes its direction periodically the current is called alternative (a. c.).

Alternating current is the current that changes direction periodically. The electrons leave one terminal of the power supply, flow out along the conductor, stop, and then flow back toward the same terminal. A voltage that caused current reverses its polarity periodically. This is properly called an alternating voltage. The power supply that provides the alternating voltage actually reverses the polarity of its terminals according to a fixed periodic pattern. A given terminal will be negative for a specific period of time and drive electrons out through the circuit. Then, the same terminal becomes positive and attracts electrons back from the circuit. This voltage source cannot be a battery. It must consist of some types of rotating machinery.

II. Guess the meaning of the following international words:

- 1) physicist,
- 2) ampere,
- 3) symbol,
- 4) second,
- 5) polarity,
- 6) period,
- 7) battery.

III. Translate into Russian the words and expression from the text:

- 1) increment of electrons;
- 2) measuring;
- 3) to drive;
- 4) directly proportional;
- 5) conductor;
- 6) strength;
- 7) causing force;
- 8) terminal;
- 9) to flow;
- 10) to reverse.

IV. Give the English equivalents for the words below:

- 1) переменный ток,
- 2) за секунду,
- 3) количество электронов,
- 4) поток электронов,
- 5) магнитное поле,
- 6) направление,
- 7) зависеть,
- 8) усиление,
- 9) источник напряжения,
- 10) ротационный механизм.

V. Complete the sentences using the text:

1. The electric current is ...
2. The unit for measuring current is ...
3. A stream of electrons in a circuit will develop ...
4. The current is called direct if ...
5. The current is called alternating if...
6. Alternating voltage is ...
7. Alternating voltage source cannot be ...

VI. Answer the questions:

1. Why do electrons move along the circuit?
2. What does the strength of the magnetic field depend upon?
3. What does the direction of the field depend upon?
4. What is the way of alternating current electrons?
5. How does the alternating voltage power supply reverse the polarity of terminals?

VI. Talk on the properties of the electric current and its types.

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