

全国中等职业技术学校 电子类专业教材
专业英语系列教材

电子英语

ELECTRONIC ENGLISH

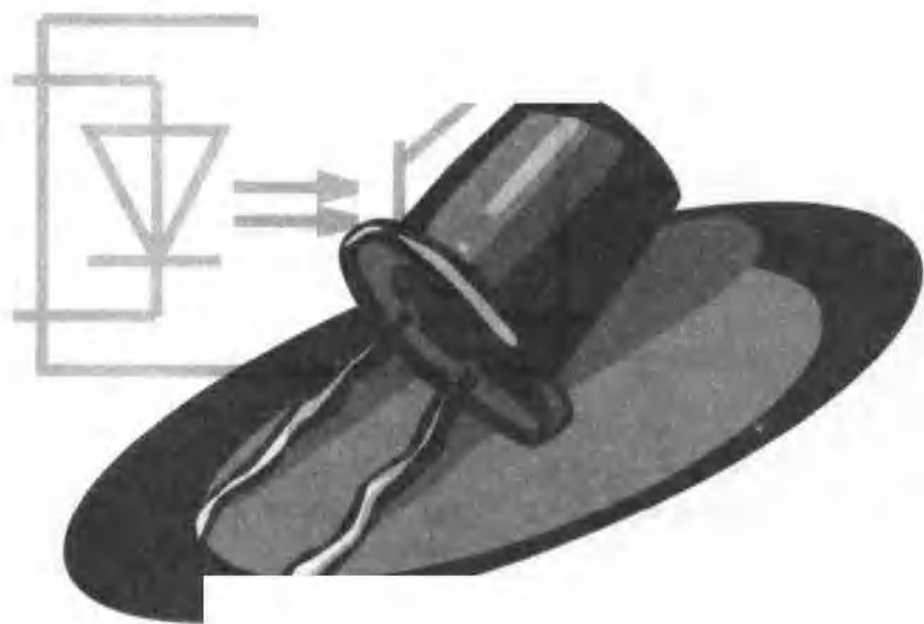


 中国劳动社会保障出版社

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简介

本书根据劳动和社会保障部培训就业司颁发的《电子类专业教学计划》编写,供全国中等职业技术学校电子类专业使用。本书主要以阅读、对话的形式介绍了与电子类专业密切相关的内容,包括电子元器件、电子仪器仪表、电子设备说明、电子技术发展的新动态等。全书共18单元,每单元内容包括阅读、对话、词汇、重点专业词汇、注释和练习。本书内容丰富,通俗易懂;形式活泼,图文并茂。

本书也适合作为职业培训教材和职工自学用书。

本书由周虹编写,度朝永审稿。

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前 言

随着我国社会主义市场经济的进一步发展，特别是入世以后，越来越多的企业对技术工人的专业外语水平提出了较高的要求，因此，专业英语已成为学生们参与就业竞争，以及今后从业后在工作中所必需的工具之一。为适应这一需要，我们组织编写了这套专业英语教材，并在编写过程中坚持了以下原则：

第一，与专业紧密结合，根据专业需要设置单元内容，力求收录各专业最新、最实用的词汇和用语，并注意在选材时降低相关专业知识的难度，使教材既突出专业特色，又能充分体现英语教学的规律。

第二，根据不同专业对英语教学的要求，教材在单元设置中阅读和口语各有侧重，如《饭店服务英语》《商品经营英语》等侧重口语，而《计算机专业英语》《电子英语》等则侧重阅读。对专业性较强的部分教材还给出了阅读部分的译文，以方便师生的教和学。

第三，教材在内容上注重选材新颖实用，力求采用地道的英语表达；在形式上注重生动活泼，图文并茂。

本套教材为中等职业技术学校学生设计，初中起点，并与通用教材《英语》相配套。考虑到通用英语教材中已讲授语法，故此套教材不再列入语法条目，涉及到语法难点时在“注释”中予以讲解。

本套教材自成体系，同时每种教材的编写又参照了相关专业的教学计划和主要专业课程的教学大纲，故又可与各相关专业配套使用。

本套教材首先推出《计算机专业英语》《电子英语》《会计英语》《饭店服务英语》《烹饪实用英语》《文秘英语》《物业管理英语》《商品经营英语》《服装英语》等9种，并将根据专业需要继续推出《机械英语》《汽车维修英语》《电工英语》《机电英语》《美容美发英语》等，以满足各专业学生学习英语的需要。

此次教材的开发工作得到了北京、湖南、湖北、广东、江苏等省（市）劳动和社会保障厅（局）以及有关学校的大力支持，并得到了美国新闻学硕士 Mr. Michael Connelly 的大力帮助，对此我们表示诚挚的谢意。

劳动和社会保障部教材办公室

2003年5月

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Lesson One

Charge and Current



Let's read

Do remember the formula as follows;

$$\text{current} = \frac{\text{charge}}{\text{time}}$$

$$\text{i. e. } I = \frac{Q}{t}$$

Where:

I = current in amperes

Q = charge in coulombs

t = time in seconds

Example;

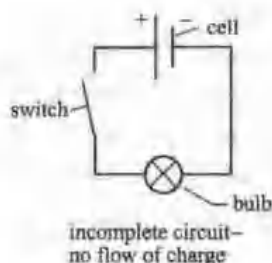
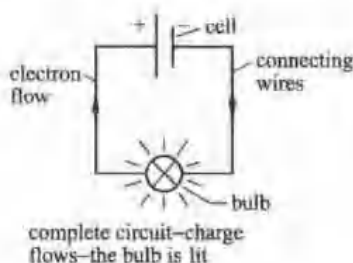
If 6 C of charge flow past point P in 3 s, the current flowing in the circuit ⁽²⁾ is 2 A.



Under normal circumstances, the drift of electrons is haphazard and there is no net flow of charge.

If a cell is connected across the wire, the electrons will flow from the negative to the positive terminal. This flow of charge creates an electric current.

Current will flow only if a circuit is complete. Switches turn circuits on and off by making them complete or incomplete.





Let's speak

A: Excuse me, Peter?

B: Yes, Roger?

A: Could you tell me the unit of current?

B: Sure, the unit of current is ampere.

A: What is the symbol for it?

B: Oh, it's very simple, it's "I".



New words and expressions

charge [tʃɑ:dʒ] *n.* 负荷, 电荷

current [ˈkʌrənt] *n.* 电流

formula [ˈfɔ:mjulə] *n.* 公式, 规则

ampere [ˈæmpeə(r)] *n.* 安培

coulomb [ˈku:lɒm] *n.* 库仑 (电量单位)

circuit [ˈsə:kit] *n.* 电路

circumstance [ˈsə:kəmstəns] *n.* 环境, 境况

drift [drift] *n.* 漂流

electron [iˈlektɹən] *n.* 电子

haphazard [ˈhæpˌhæzəd] *adj.* 杂乱的, 任意的

net [net] *n.* 网, 网络

cell [sel] *n.* 电池

connect [kəˈnekt] *v.* 连接, 联合

wire [ˈwaɪə] *n.* 电线

negative [ˈnegatɪv] *adj.* 负的, 阴性的

positive [ˈpɒzətɪv] *adj.* 正的, 阳性的

terminal [ˈtə:miɪnəl] *n.* 终端, 端子, 接线柱

electric [iˈlektɹɪk] *adj.* 电的, 导电的

complete [kəmˈpli:t] *adj.* 全部的, 完全的, 完成的

switch [swɪtʃ] *n.* 开关

incomplete [ˌɪnkəmˈpli:t] *adj.* 不完全的, 不完善的

bulb [bʌlb] *n.* 灯泡, 球形物

light [laɪt] *n.* 光, 灯 *vi.* 点着, 变亮

symbol [ˈsɪmbəl] *n.* 符号, 记号

as follows 如下

under normal circumstances 在正常情况下

turn on/turn off 开, 接通/关, 切断



Technical terms

1. positive (negative) charge 正(负)电荷
2. positive (negative) terminal 正(负)端子
3. electric current 电流



Notes

1. “i. e.” 即 “that is” 译作 “即”。
2. “flowing in the circuit” 作 “current” 的定语。



Let's practice

1. Try to answer the questions orally:

- (1) Do you know the unit of charge?
- (2) What creates an electric current?

2. True or false:

- ☐ (1) “I” is the symbol for charge.
- ☐ (2) The symbol Q stands for (表示) the unit of electric charge.
- ☐ (3) Electric current flows from the negative to the positive terminal.

□ (4) The formula $I = \frac{Q}{t}$, where Q means current in amperes.

3. Translate the following sentences into Chinese:

- (1) If 10 C of charge flow past point P in 2 s, the current flowing in the circuit is 5 A.
 (2) In a wire, the current is a flow of electrons. If I is the current and Q is the charge passing any point in time t , then

$$Q = I \cdot t$$

4. Translate the following expressions into English:

- (1) 2 库仑正电荷 (2) 产生电流 (3) 切断电路 (4) 电流的单位

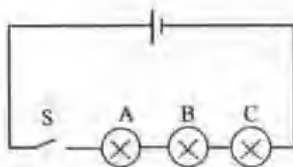


Let's learn more

Series and Parallel

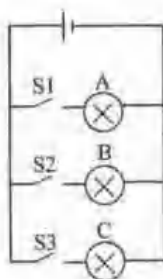
Series (串联) and parallel (并联) circuits are the most typical circuits known.

In a series circuit, the current has only one path (路径) to follow. There are no branches (支路). One switch will turn the whole circuit on or off.



When S is closed bulbs A, B and C light up

In a parallel circuit, there are several paths the current might follow. Switches can be used to turn the whole or just part of the circuit on or off.



Bulb A will light up when switch S1 is closed.
 Bulb B will light up when switch S2 is closed.
 Bulb C will light up when switch S3 is closed.

Lesson Two

EMF and PD



Let's read

A power supply such as a cell provides charges of energy to flow around in a circuit. The amount of energy is determined by the electromotive force (EMF) of the cell (measured in volts).

The potential difference (PD) (of a component) is the value, measured in volts^[1], between the terminals of a component in a circuit.

As^[2] each coulomb of charge travels through the various components in a circuit, all the energy is converted into other forms.



Let's speak

A: Do you remember what EMF is?

B: It's short for electromotive force.

A: Pardon me? Would you explain it in detail?

B: I'm sorry. I have no time right now. Look it up in the text,

I believe you will find the answer.



New words and expressions

power [ˈpaʊə] *n.* 电力, 能力

supply [səˈplaɪ] *n.* 供给

provide [prəˈvaɪd] *v.* 供应, 供给

energy [ˈenədʒi] *n.* 能量
 amount [əˈmaʊnt] *n.* 数量
 determine [diˈtɜːmɪn] *v.* 确定
 electromotive [iːlektroʊməutiv] *adj.* 电动的
 force [fɔːs] *n.* 力量
 measure [ˈmeʒə] *vt.* 测量
 volt [vɒlt, vɔlt] *n.* 伏特
 potential [pəˈtenʃ(ə)l] *n.* 电位, 电势
 difference [ˈdɪfərəns] *n.* 差额, 差分
 component [kəmˈpəʊnənt] *n.* 成分, 元件
 value [ˈvæljuː] *n.* 价值, 值
 travel [ˈtrævl] *vi.* 移动, 行进
 various [ˈvɛəriəs] *adj.* 不同的, 多样的
 convert [kənˈvɜːt] *vt.* 使转变, 转换……
 form [fɔːm] *n.* 形态, 形式
 detail [ˈdiːteɪl, diːteɪl] *n.* 细节, 详情
 such as 例如
 convert into 转换为
 in detail 详细地
 right now 马上, 立即
 look up (在词典等书籍中) 查寻



Technical terms

1. power supply 电源
2. electromotive force (EMF) 电动势
3. potential difference (PD) 电势差



Notes

1. “measured in volts” 是插入语, 进一步解释 “value”。
2. “As” 引导状语从句, 译作 “当……的时候”。



Let's practice

1. Try to answer the questions orally:

- (1) What is the potential difference?
- (2) What is the unit of EMF?

2. True or false:

- ☐ (1) A cell provides charges of energy to flow around in a circuit.
- ☐ (2) The electromotive force of a cell is determined by the amount of energy.
- ☐ (3) The value of PD is measured in amperes.
- ☐ (4) All the energy is converted into current as each coulomb of charge travels in a circuit.

3. Translate the following sentences into Chinese:

- (1) The amount of energy is determined by the electromotive force (EMF) of the cell (measured in volts).
- (2) As each coulomb of charge travels through the various components in a circuit, all the energy is converted into other forms.

4. Translate the following expressions into English:

- (1) 元件两端的电势差
- (2) 电源电动势
- (3) 用伏特量度
- (4) 转换为其他能量



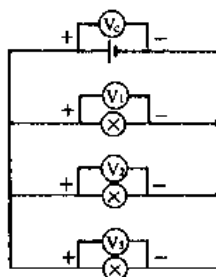
Let's learn more

Measuring Voltage

A voltmeter (电压表) is connected across a component and measures the potential difference across the component.

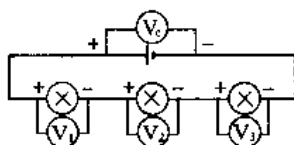
In a parallel circuit, the PDs across all the branches of a network (网路) are the same.

$$V_c = V_1 = V_2 = V_3$$



In a series circuit, if all the electrical energy the charges receive from the cell is converted into other forms of energy in the external (外部的) part of the circuit, then the sum (总和) of the PDs in the external part of the circuit is equal to the PD across the cell.

$$V_c = V_1 + V_2 + V_3$$



Lesson Three

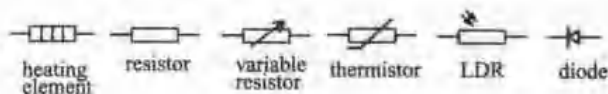
Resistance



Let's read

Resistance impedes the flow of current. It is represented by the symbol R and is measured in unit of ohm.

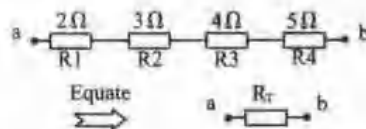
Resistance components are as follows: heating elements, resistors, variable resistors, thermistors, light-dependent resistors (LDRs) and diodes.



If the resistors are connected in series, the resistance R_T is given by;

$$R_T = R_1 + R_2 + R_3 + R_4 + \dots + R_n$$

Example;

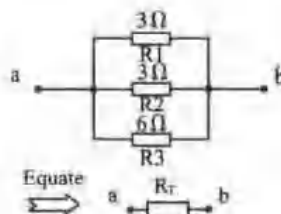


$$R_T = 2\Omega + 3\Omega + 4\Omega + 5\Omega = 14\Omega$$

If several resistors are connected in parallel, their total resistance R_T can be found using the equation;

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}$$

Example;



$$\frac{1}{R_T} = \frac{1}{3\Omega} + \frac{1}{3\Omega} + \frac{1}{6\Omega}$$

$$\frac{1}{R_T} = \frac{5}{6}\Omega^{-1}$$

$$R_T = 1.2\Omega$$



Let's speak

A: How about having a coffee break ^[1]?

B: Why not? I'm dying for sleep ^[2].

A: Do you remember everything about "resistance"?

B: Well, I don't think diodes are easy for me.

A: Don't worry. They are discussed in the other chapter.

B: It sounds good. Here we go.



New words and expressions

resistance [riːzistəns] *n.* 阻力, 电阻, 阻抗

impede [imˈpiːd] *v.* 阻止, 阻碍

represent [ˌriːpriːzent] *vt.* 描绘, 代表, 表示

ohm [əʊm] *n.* 欧姆 (电阻单位)

element [ˈelɪmənt] *n.* 要素, 元件

resistor [riːzistə] *n.* 电阻器

variable [ˈveəriəbl] *adj.* 可变的, 不定的

thermistor [θərˈmɪstə] *n.* 热敏电阻

dependent [dɪˈpendənt] *adj.* 依靠的, 由……决定的

diode [ˈdaɪəʊd] *n.* 二极管

series [ˈsɪəriːz] *n.* 串联

equate [iˈkweɪt] *v.* 使相等, 等同

parallel [ˈpærəlel] *n.* 并联

equation [iˈkweɪʃən] *n.* 方程式, 等式

die [dai] *vi.* 死亡, 渴望

discuss [dis·kʌs] *vt.* 讨论, 论述

chapter [ˈtʃæptə] *n.* (书籍) 章

in unit of 以……为单位



Technical terms

1. heating element 发热元件
2. variable resistor 可变电阻
3. light-dependent resistor (LDR) 光敏电阻
4. connect in series 串联
5. connect in parallel 并联



Notes

1. “having a coffee break” 意思是“喝杯咖啡, 休息一下”。
2. “dying for sleep” 意思是“困得要命”。



Let's practice

1. Try to answer the questions orally:

- (1) What are the uses of resistance components in circuits?
- (2) Can you name some resistance components?

2. True or false:

- ☐ (1) Resistors impede the flow of current.
- ☐ (2) Diodes reduce the value of voltage in a circuit.
- ☐ (3) Thermistors can be connected in series.

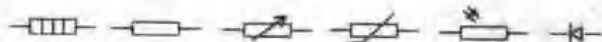
□ (4) LDRs can not be connected in parallel.

3. Translate the following sentences into Chinese:

(1) If several resistors are connected in parallel, their total resistance can be found using the following equation.

(2) Resistance is represented by the symbol R and measured in the unit of ohm.

4. Write down the correct English below the symbols:

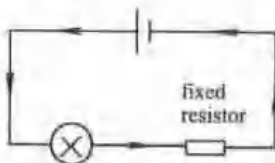


Let's learn more

Resistance to Current Flow

The resistance (R) of a piece of wire depends upon the length of the wire, the cross-sectional (横断的) area of the wire, the temperature of the wire and the material from which the wire is made.

To control the size of the current flowing in circuit we use resistors. The resistors have values measured in ohms (Ω). A resistor of 100Ω is a much greater obstacle (障碍) of current than a resistor of 10Ω .



Variable resistors have values that can be altered (改变), so it is possible to adjust (调整) the current flowing in the circuit.

