

Making Use of Electricity

Level: S2

Topic: Making Use of Electricity (Sections 8.1 – 8.8 of Unit 8)

Introduction:

This set of ELAs aims to consolidate students' learning of the English scientific terms relevant to the topic 'Electricity' when Chinese medium had been used for teaching the Unit initially, with English terms being introduced alongside with the Chinese terms. At the end of the ELA Unit, the teacher revises all the English terms introduced, with the aid of PowerPoint slides. Short quizzes are also given to students as assessment.

There are three ELAs in this set of materials:

ELA1 Spelling quiz (1)

ELA2 Spelling quiz (2)

ELA3 Matching quiz

Each ELA lasts for half a period.

ELA1 Lesson Plan—Making Use of Electricity – Spelling Quiz (1)

- Description: This ELA covers Sections 8.1 – 8.4 in the CDC science syllabus. The English terms have been introduced already when the topic was taught in Chinese. In this ELA, the teacher revises the English terms with the class using some PowerPoint slides. Time is then given to students to review the spelling of the terms. After that, there is a spelling quiz.
- Content Objectives: After completing the activity, students should be able to:
- explain the following concepts: *electric circuit, electric current, ammeter, ampere (A), voltage, voltmeter, volt (V), electrical conductor, and electrical insulator*;
 - measure current and voltage with *ammeters* and *voltmeters* respectively;
 - use the units *ampere* and *volt* appropriately.
- Language Objectives: After completing the activity, students should be able to:
- understand the English terms related to this topic (e.g., *electric circuit, electric current, ammeter, ampere, voltage, voltmeter, volt, electrical conductor, and electrical insulator*);
 - use these English terms to label a set of given pictures and diagrams;
 - understand use these English expressions for explaining the key concepts, e.g.,
 - *An electric circuit is a path for electricity to flow through.*
 - *An electric current is a flow of electric charges.*
 - *We use an ammeter to measure electric currents.*
 - *Ampere is the unit of an electric current.*
 - *Voltage is the push that makes electric current flow in a circuit.*
 - *We use a voltmeter to measure voltage.*
 - *Volt is the unit of voltage.*
 - *An electrical conductor allows electric current to pass through.*
 - *An electrical insulator does not allow electric current to pass through.*
- Activities:
1. Revision of terms – whole class activity (8 min)
 2. Spelling quiz – individual work (12 min)

Materials: PowerPoint slides for revising the terms, Worksheet for Spelling Quiz 1

Steps:

Revision of terms – whole class activity (8 min)

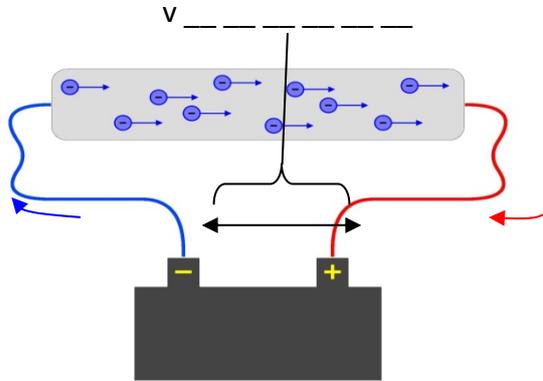
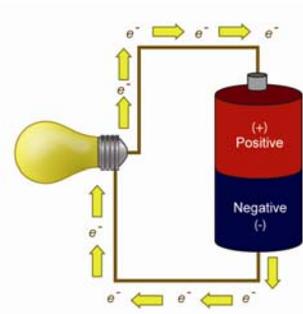
1. With the aid of PowerPoint slides, the teacher should revise with the class the concepts as well as the key terms related to the topic Making Use of Electricity.
2. At the end of the revision, the teacher should make sure that students can pronounce the key terms in the vocabulary list.

Spelling quiz – individual work (12 min)

3. The teacher should tell the class that they are going to have a spelling quiz to see how well they can remember the spelling of the terms.
4. With the vocabulary list still displayed on the screen, students should be given five minutes to learn the spelling of the terms. During this time, they should be encouraged to help each other learn the terms, e.g. by spelling them to their neighbours.
5. The teacher should then distribute the worksheet for Spelling Quiz 1 to students.
6. The teacher should invite several students to come out and put down their answers on the blackboard. Students should be asked to mark their own quiz papers with a red-ball pen.
7. The teacher can reward those students who have all the terms spelt correctly.

Making Use of Electricity 電的使用 – Spelling Quiz (1)

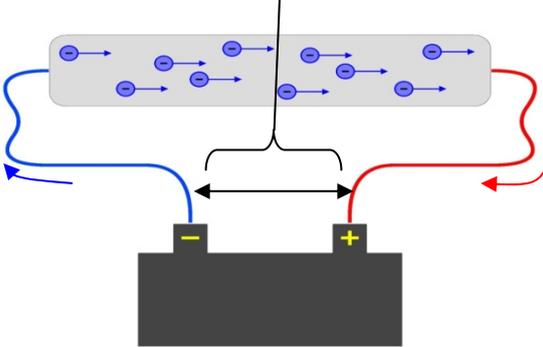
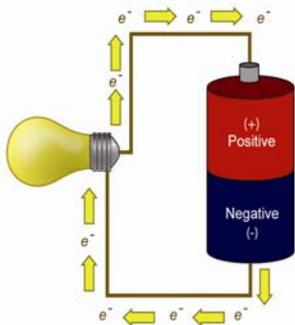
Complete the following English terms using the hints provided by the pictures.

<p>1.</p> <p>v _____</p> 	<p>2.</p> <p>e _____</p> <p>c _____</p>  <p>e _____</p> <p>i _____</p>
<p>3.</p> <p>v _____</p>  <p>v _____</p>	<p>4.</p> <p>a _____</p>  <p>a _____</p>
<p>5.</p> <p>e _____ ci _____</p>  <p>e _____</p> <p>c u _____</p>	

Making Use of Electricity 電の使用 – Spelling Quiz (1)

Answers

Complete the following English terms using the hints provided by the pictures.

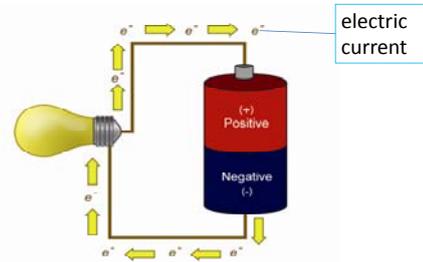
<p>1. v<u>oltage</u></p> 	<p>2. e<u>lectrical</u> c<u>onductor</u></p>  <p>e<u>lectrical</u> i<u>nsulator</u></p>
<p>3. v<u>oltmeter</u></p>  <p>v<u>olt</u></p>	<p>4. a<u>mmeter</u></p>  <p>a<u>mpere</u></p>
<p>5. e<u>lectric</u> c<u>ircuit</u></p>  <p>e<u>lectric</u> c<u>urrent</u></p>	

Slides for revising the English terms

Making Use of Electricity (1) 電の使用 (1)

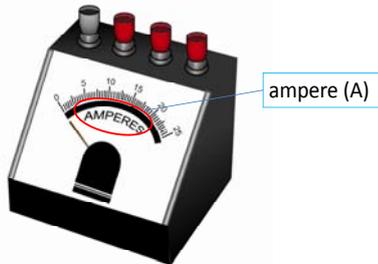
ELA Research Team, OUHK
February 2010

Electric circuit



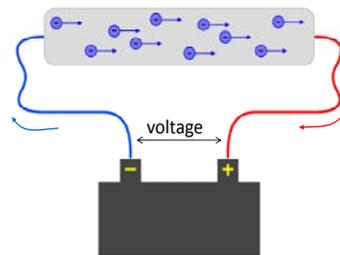
- An **electric circuit** is a path for electricity to flow through.
- An **electric current** is a flow of **electric charges** (電荷).

Ammeter — (A) —



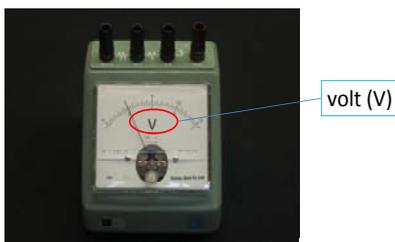
- We use an **ammeter** to measure electric currents.
- **Ampere** is the unit of an electric current.

Voltage



- **Voltage** is the push that makes electric current flow in a circuit.

Voltmeter — (V) —



- We use a **voltmeter** to measure voltage.
- **Volt** is the unit of voltage.

electrical conductor



electrical insulator

- An **electrical conductor** allows electric current to pass through.
- An **electrical insulator** does not allow electric current to pass through.

Vocabulary

electric circuit 電路

electric current 電流

ammeter 安培計

ampere (A) 安培

voltage 電壓

voltmeter 伏特計

volt (V) 伏特

electrical conductor 導電體

electrical insulator 絕緣體

ELA2 Lesson Plan—Making Use of Electricity – Spelling Quiz (2)

Description: This ELA covers Sections 8.5 – 8.8 in the CDC science syllabus. The English terms have been introduced when the topic was taught in Chinese in the previous lessons. In this ELA, the teacher revises the English terms with the class, using some PowerPoint slides. Then time is given to students to learn the spelling of the terms. After that there will be a spelling quiz.

Content After completing the activity, students should be able to:

- Objectives:**
- understand the following concepts: *resistance* and *short circuit*;
 - understand the functions of *resistors* and *fuses* in a circuit;
 - use the unit *ohm* appropriately; and
 - distinguish between *series* and *parallel circuits*.

Language After completing the activity, students should be able to:

- Objectives:**
- understand and the English terms related to circuits (e.g., *resistance*, *ohm*, *resistor*, *series circuit*, *parallel circuit*, *fuse*, and *short circuit*);
 - use these English terms to label a set of given pictures and diagrams;
 - understand use these English expressions for explaining the key concepts related to circuits, e.g.,
 - *Resistance is the force in an object that opposes the flow of electric current.*
 - *Ohm (Ω) is the unit of resistance.*
 - *Each resistor has a fixed amount of resistance.*
 - *We use a resistor to limit the amount of electric current that can flow through a circuit.*
 - *In a series circuit, there is only one path for electric current to flow through.*
 - *In a parallel circuit, there is more than one path for electric current to flow through.*

- Activities:**
1. Revision of terms – whole class activity (8 min)
 2. Spelling quiz – individual work (12 min)

Materials: PowerPoint slides for revising the terms, Worksheet for Spelling Quiz 2

Steps:

Revision of terms – whole class activity (8 min)

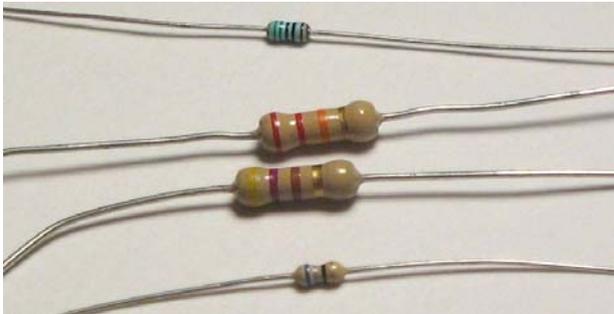
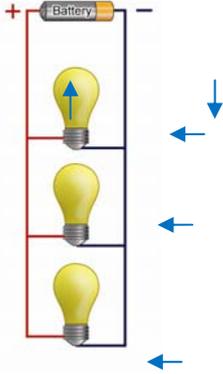
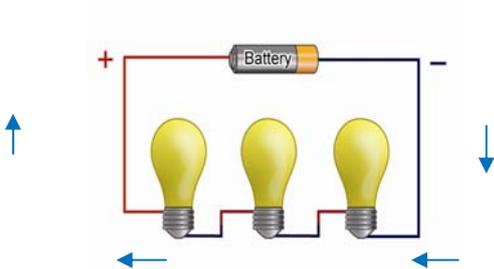
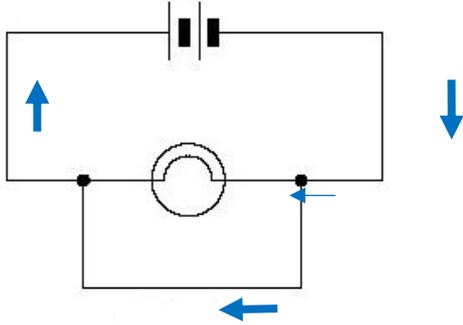
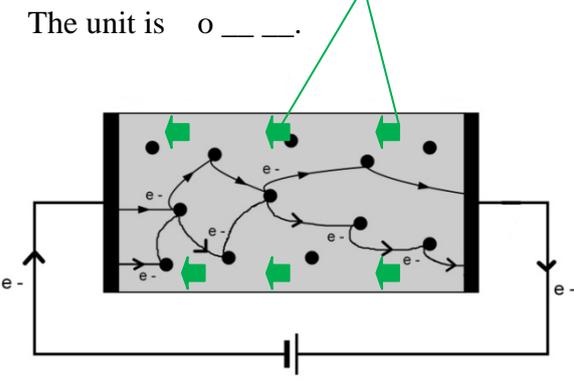
1. With the aid of PowerPoint slides, the teacher should revise with the class the concepts and key terms related to the topic Making Use of Electricity.
2. At the end of the revision, the teacher should make sure that students can pronounce the key terms in the vocabulary list.

Spelling quiz – individual work (12 min)

3. The teacher should tell the class that they are going to have a spelling quiz to see how well they have learned the spelling of the terms.
4. With the vocabulary list still displayed on the screen, students should be given five minutes to learn the spelling of the terms. During the revision, they are encouraged to help each other to learn by spelling the terms to their neighbours.
5. The teacher should then distribute the worksheet for Spelling Quiz 2 for students to complete.
6. The teacher should check the answers by inviting some students to come out and write their answers on the board. Students should be asked to mark their own quiz papers with a red-ball pen.
7. The teacher can reward those students who have all the terms spelt correctly.

Making Use of Electricity 電的使用 – Spelling Quiz (2)

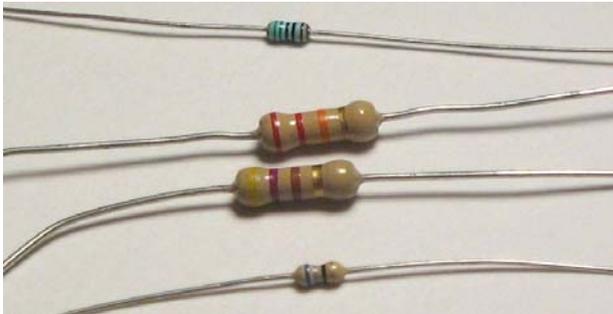
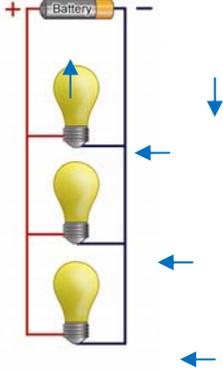
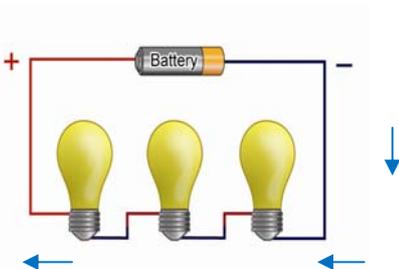
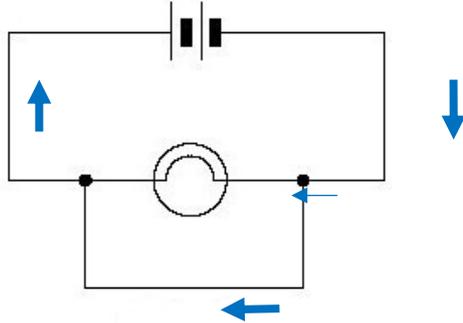
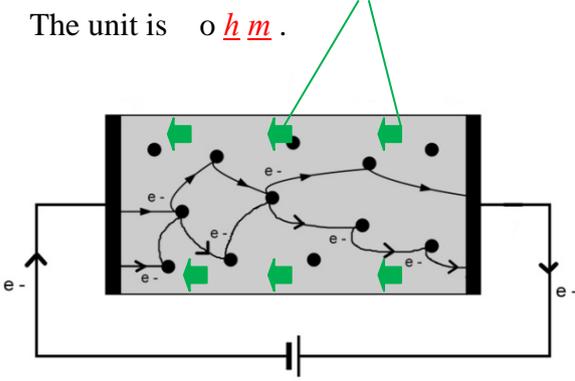
Complete the following English terms using the hints provided by the pictures.

<p>1. r _____</p> 	<p>2. p _____ c _____</p> 
<p>3. s _____ c _____</p> 	<p>4. s _____ c _____</p> 
<p>5. r _____</p> <p>The unit is o _____.</p> 	<p>6. f _____</p> 

Making Use of Electricity 電的使用 – Spelling Quiz (2)

Answers

Complete the following English terms using the hints provided by the pictures.

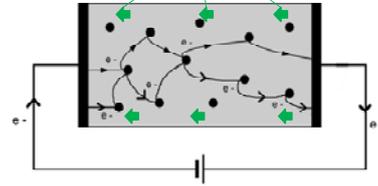
<p>1. r<u>e</u>s<u>i</u>s<u>t</u>o<u>r</u></p> 	<p>2. p<u>a</u>r<u>a</u>l<u>e</u>l<u>e</u>l c<u>i</u>r<u>c</u>u<u>i</u>t</p> 
<p>3. s<u>e</u>r<u>i</u>e<u>s</u> c<u>i</u>r<u>c</u>u<u>i</u>t</p> 	<p>4. s<u>h</u>o<u>r</u>t c<u>i</u>r<u>c</u>u<u>i</u>t</p> 
<p>5. r<u>e</u>s<u>i</u>s<u>t</u>a<u>n</u>c<u>e</u> The unit is o<u>h</u>m.</p> 	<p>6. f<u>u</u>s<u>e</u></p> 

Slides for revising the English terms

Making Use of Electricity (2) 電の使用 (2)

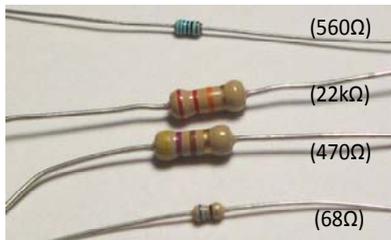
ELA Research Team, OUHK
February 2010

Resistance (in ohm Ω)



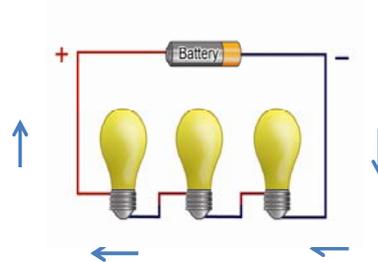
- **Resistance** is the force in an object that opposes the flow of electric current.
- **Ohm** (Ω) is the unit of resistance.

Resistor



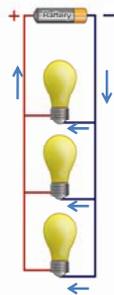
- Each **resistor** has a fixed amount of resistance.
- We use a resistor to limit the amount of electric current that can flow through a circuit.

Series circuit



- In a **series circuit**, there is only one path for electric current to flow through.

Parallel circuit



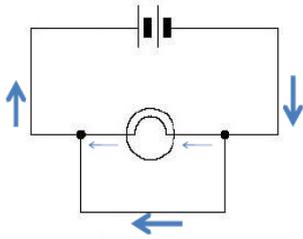
- In a **parallel circuit**, there are more than one path for electric current to flow through.

Fuse



- We use a **fuse** to prevent too much electric current from flowing through a circuit.

Short circuit



- A **short circuit** is an electrical path in a circuit that causes most of the current to flow through but not through other paths in the circuit.

Vocabulary

resistance 電阻

ohm 歐姆

resistor 電阻器

series circuit 串聯電路

parallel circuit 並聯電路

fuse 保險絲

short circuit 短路

ELA3 Lesson Plan—Making Use of Electricity – Matching Quiz

Description: In the previous two quizzes, students were asked to write down the concept terms as indicated by the pictures shown. The focus of the two quizzes is spelling of the terms. In this ELA, the focus shifts to verbal explanations. The teacher uses the same set of slides for revision but putting greater emphasis on characteristics and explanation of the terms. After that, students are asked to match the English terms with their verbal explanations.

Content After completing the activity, students should be more able to:

Objectives:

- Understand the key concepts related to making use of electricity: *electric circuit, electric current, voltage, electrical conductor, ampere, ammeter, voltmeters electrical insulator; resistance, short circuit; fuses, ohm, series circuits and parallel circuit*);

Language After completing the activity, students should be more able to:

Objectives:

- understand the English terms related to the key concepts of this topic (e..g, *electric circuit, electric current, ammeter, ampere, voltage, voltmeter, volt, electrical conductor, electrical insulator, resistance, ohm, resistor, series circuit, parallel circuit, fuse, and short circuit*);
- understand use these English expressions for explaining the key concepts, e.g.,
 - *An electric circuit is a path for electricity to flow through.*
 - *An electric current is a flow of electric charges.*
 - *We use an ammeter to measure electric currents.*
 - *Ampere is the unit of an electric current.*
 - *Voltage is the push that makes electric current flow in a circuit.*
 - *We use a voltmeter to measure voltage.*
 - *Volt is the unit of voltage.*
 - *An electrical conductor allows electric current to pass through.*
 - *An electrical insulator does not allow electric current to pass through.*
 - *Resistance is the force in an object that opposes the flow of electric current.*
 - *Ohm (Ω) is the unit of resistance.*
 - *Each resistor has a fixed amount of resistance.*
 - *We use a resistor to limit the amount of electric current that can flow through a circuit.*

- *In a series circuit, there is only one path for electric current to flow through.*
- *In a parallel circuit, there is more than one path for electric current to flow through.*

- Activities:
1. Revision of terms – whole class activity (10 min)
 2. Matching Quiz – individual work (10 min)

Materials: PowerPoint slides for revising the terms, Worksheet for Matching Quiz

Steps:

Revision of terms – whole class activity (8 min)

1. With the aid of PowerPoint slides, the teacher should revise with the class the key concepts and terms, drawing students' attention to the verbal explanations given in the slides. Any difficult words should be explained.

Matching quiz – individual work (10 min)

2. The teacher should ask students to complete the Matching Quiz on their own.
3. The teacher should check the answers and explain any items that students have difficulty with. Students should be asked to mark their answers with a red-ball pen.
4. Students should be asked to work in pairs, reading to one another the concept terms and the explanation for each one.
5. The teacher can reward those students who have completed all the items correctly.

Making Use of Electricity 電的使用—Matching Quiz

Match the terms in Column A with the explanations in Column B by writing the letters a to p in the brackets next to the items in Column A.

<u>Column A</u>		<u>Column B</u>	
1.	ammeter ()	.a	A path for electricity to flow through
2.	ampere ()	.b	A flow of electric charges
3.	electric circuit ()	.c	A force in an object that opposes the flow of electric current
4.	electric current ()	.d	An object that allows an electric current to pass through
5.	electrical conductor ()	.e	An object that does not allow an electric current to pass through
6.	electrical insulator ()	f	A push that makes electric current flow in a circuit
7.	fuse ()	.g	We use it to limit the amount of electric current that can flow through a circuit.
8.	ohm ()	.h	There is more than one path for electric current to flow through.
9.	parallel circuit ()	.i	There is only one path for electric current to flow through.
10.	resistance ()	.j	An electrical path in a circuit that causes most of the current to flow through but not through other paths in the circuit
11.	resistor ()	.k	The unit of an electric current
12.	series circuit ()	.l	The unit of voltage
13.	short circuit ()	m	The unit of resistance
14.	volt ()	.n	We use it to measure electric currents.
15.	voltage ()	.o	We use it to measure electric voltage.
16.	voltmeter ()	.p	We use it to prevent too much electric current from flowing through a circuit.

Making Use of Electricity 電的使用—Matching Quiz

Answers

Match the terms in Column A with the explanations in Column B. Write the letters next to the items in Column A.

<u>Column A</u>		<u>Column B</u>
1. ammeter	(<i>n</i>)	a. A flow of electric charges
2. ampere	(<i>k</i>)	b. A path for electricity to flow through
3. electric circuit	(<i>b</i>)	c. A force in an object that opposes the flow of electric current
4. electric current	(<i>a</i>)	d. An object that does not allow an electric current to pass through
5. electrical conductor	(<i>e</i>)	e. An object that allows an electric current to pass through
6. electrical insulator	(<i>f</i>)	f. A push that makes electric current flow in a circuit
7. fuse	(<i>p</i>)	g. It has a fixed resistance. We use it to limit the amount of electric current that can flow through a circuit.
8. ohm	(<i>m</i>)	h. There is more than one path for electric current to flow through.
9. parallel circuit	(<i>h</i>)	i. There is only one path for electric current to flow through.
10. resistance	(<i>c</i>)	j. An electrical path in a circuit that causes most of the current to flow through but not through other paths in the circuit
11. resistor	(<i>g</i>)	k. The unit of an electric current
12. series circuit	(<i>i</i>)	l. The unit of voltage
13. short circuit	(<i>j</i>)	m. The unit of resistance
14. volt	(<i>l</i>)	n. We use it to measure electric currents.
15. voltage	(<i>f</i>)	o. We use it to measure electric voltage.
16. voltmeter	(<i>o</i>)	p. We use it to prevent too much electric current from flowing through a circuit.