

## UNIT 1: ELECTRIC CIRCUITS

### LESSON 1: What is electricity?

**Aim:** what electricity is and how it can be obtained.

#### Teacher objectives

##### Content

- Atomic structure
- Definition of electricity
- Sources of electricity

##### Communication

- Introduction of specific vocabulary
- Use of phrases to explain events
- Use of comparatives

##### Cognition

- Understanding what electricity is
- Remembering two ways to get electricity

##### Culture

- Electricity in the daily life of students
- Who Thomas Edison was

#### Outcomes:

At the end of the lesson students will be able:

- To understand the importance of electrical energy in daily life
- To identify atomic particles: qualities and behaviour
- To identify different kinds of atoms depending on their charge
- To define what electricity is
- To identify two ways to get electricity
- To identify the steps of the way of electricity from a power station to a plug
- To know how we can get energy from a cell
- To know specific vocabulary of electricity
- To use phrases to explain events
- To use comparatives

**LESSON 2: Introduction to electric circuits**

**Aim:** what an electric circuit is and which its basic components are.

**Teacher objectives**

Content

- Definition of electric circuit
- Simple electric circuit
- Introduction of basic electric components
- Symbols of basic electric components
- Introduction of conductors and insulators

Communication

- Introduction of specific vocabulary
- Use of phrases to explain the results of an experiment
- Use of phrases to make conclusions

Cognition

- Deducing concepts through making comparisons
- Understanding how an electric circuit works
- Understanding the function of electric circuit's basic components
- Remembering symbols of basic electric components
- Constructing electric circuits following the instructions
- Drawing electric diagrams
- Making conclusions

**Outcomes:**

At the end of the lesson students will be able:

- To understand how an electric circuit works
- To understand which function of every basic electric circuit's component is
- To identify basic electric components
- To identify symbols of basic electric components
- To interpret a picture-scheme of an electric circuit
- To construct an electric circuit
- To use phrases to explain the results of an experiment
- To use phrases to make conclusions

### LESSON 3: Electric Components

**Aim:** differences between conductors and insulators, DC and AC and definition, types and symbols of electric components of circuits.

#### Teacher objectives

#### Content

- Definition of conductor
- Definition of insulator
- Real way
- Conventional way
- Direct current
- Definition of electric components
- Types of electric components
- Characteristics of electric components

#### Communication

- Introduction of specific vocabulary

#### Cognition

- Identifying the differences between conductors and insulators
- Identifying the differences between DC and AC
- Understanding the real way of electricity in an electric circuit
- Understanding the conventional way of electricity in an electric circuit
- Identifying different electric components
- Identifying symbols of electric components
- Understanding the energy changes to produce electrical energy from another kind of energy and vice versa

### **Outcomes:**

At the end of the lesson students will be able:

- To identify differences between conductors and insulators
- To identify differences between DC and AC
- To describe real way and conventional way of electrons in an electric circuit
- To identify electric components
- To identify symbols of electric components
- To identify which electricity changes have been happened both in generators and receivers

### **LESSON 4: Experiments with Electric Components**

**Aim:** Construction of electric circuits

#### **Teacher objectives**

##### Content

- Practical application of electric components

##### Communication

- Introduction of specific vocabulary
- Use of phrases to explain the results of an experiment
- Use of phrases to make conclusion

##### Cognition

- Remembering different electric components
- Remembering symbols of electric components
- Constructing electric circuits
- Drawing electric diagrams
- Making questions
- Making conclusions

**Outcomes:**

At the end of the lesson students will be able to:

- To remember electric components
- To remember symbols of electric components
- To interpret a picture-scheme of an electric circuit
- To construct an electric circuit
- To use phrases to explain the results of an experiment
- To use phrases to make questions

## UNIT 2: ELECTRICAL MAGNITUDES

### LESSON 5: Electrical Magnitudes

**Aim:** electrical magnitudes: voltage, current and resistance.

#### Teacher objectives

##### Content

- Definition of voltage
- Definition of current
- Definition of resistance
- Units of electrical magnitudes
- Symbols of units of electrical magnitudes
- Characteristics of resistance

##### Communication

- Introduction of specific vocabulary
- Use of phrases to make comparisons *The....the...*
- Use of phrases to give opinions
- Use of phrases to make explanations

##### Cognition

- Deducing concepts through making comparisons
- Understanding what voltage, current and resistance are
- Knowing electrical magnitudes' units
- Identifying symbols of the electrical magnitudes' units
- Making conclusions

**Outcomes:**

At the end of the lesson students will be able to:

- To define voltage, current and resistance
- To know electrical magnitudes' units
- To identify symbols of electrical magnitudes' units
- To use phrases to make comparisons
- To use phrases to give opinions
- To use phrases to make conclusions
- To deduce concepts through making comparisons

**LESSON 6: Instruments to measure**

**Aim:** Construction of electric circuits and instruments to measure electrical magnitudes

**Teacher objectives**

Content

- Practical application of electric components
- Voltmeter, ammeter, ohmmeter and multimeter
- Symbols of instruments to measure

Communication

- Use of phrases to make questions
- Introduction of specific vocabulary
- Use of phrases to explain the results of an experiment
- Use of phrases to make conclusions

Cognition

- Remembering electric components
- Remembering symbols of electric components
- Remembering how a multimeter works
- Constructing electric circuits
- Drawing electric diagrams
- Making questions
- Making conclusions

### Culture

- Knowing some aspects of Alessandro Volta, André-Marie Ampère and George Simon Ohm

### Outcomes:

At the end of the lesson students will be able to:

- To remember electric components
- To remember symbols of electric components
- To remember how a multimeter works
- To construct an electric circuit
- To draw electric diagrams
- To use of phrases to explain the results of an experiment
- To use of phrases to make conclusions

## LESSON 7: Ohm's Law

**Aim:** Ohm's law

### Teacher objectives

#### Content

- Ohm's law formula

#### Communication

- Introduction of specific vocabulary
- Use of *must*
- Use of gerund
- Use of phrases to make conclusions

#### Cognition

- Resolving problems through mathematical operations
- Predicting events through making comparisons
- Understanding the relationship among voltage, current and resistance
- Making conclusions

Culture

- Approximation of the Ohm's law to daily life of students

**Outcomes:**

At the end of the lesson students will be able to:

- To resolve problems through the Ohm's law
- To predict events through making comparisons
- To understand the relationship among voltage, current and resistance
- To use of must
- To use of gerund
- To use of phrases to make conclusions

**LESSON 8: Introduction of series & parallel circuits**

**Aim:** Introduction to series circuits and parallel circuits

**Teacher objectives**

Content

- Introduction to series circuits
- Introduction to parallel circuits
- Use of multimeter
- Use of power source

Communication

- Introduction of specific vocabulary
- Use of phrases to explain the results of an experiment
- Use of phrases to make conclusions

Cognition

- Remembering electric components
- Remembering symbols of electric components
- Constructing electric circuits
- Drawing electric diagrams
- Making questions
- Applying the use of a power source

## Electric Circuits & Application of Electrical Energy

- Applying the use of a multimeter
- Learning how a power source works
- Learning how connections in series and parallel are made
- Observing the results of the experiments

### Outcomes:

At the end of the lesson students will be able to:

- To remember electric components
- To remember symbols of electric components
- To construct an electric circuit
- To draw electric diagrams
- To make questions
- To make conclusions
- To apply the use of a multimeter
- To learn how a power source works
- To learn how connections in series and parallel are made

### LESSON 9: Series & Parallel Circuits

**Aim:** connections of circuits both in series and parallel

#### Teacher objectives

##### Content

- Characteristics of series circuits
- Characteristics of parallel circuits

##### Communication

- Introduction of specific vocabulary
- Use of phrases to describe characteristics
- Use of phrases to make conclusions

##### Cognition

- Deducing characteristics of series and parallel circuits from the experiments already done
- Resolving problems through mathematical operations
- Remembering the Ohm's law

Culture

- Approximation of series and parallel circuits to daily life of students

**Outcomes:**

At the end of the lesson students will be able to:

- To deduce characteristics of a concept through experiments already done
- To identify differences between series and parallel circuits
- To resolve problems through mathematical operations

### UNIT 3: DOMESTIC ELECTRICITY

#### LESSON 10: Joule effect, short circuits & fuses

**Aim:** Joule effect, short circuit and fuses

**Teacher objectives**

Content

- Joule effect
- Short circuit
- Fuses

Communication

- Introduction of specific vocabulary
- Use of phrases to make comparisons
- Use of phrases to make conclusion

Cognition

- Remembering different electric components
- Remembering symbols of electric components
- Constructing electric circuits
- Drawing electric diagrams
- Making conclusions

Culture

- Approximation of Joule effect, short circuit and fuses to daily life of students

**Outcomes:**

At the end of the lesson students will be able to:

- To understand the Joule effect
- To understand why a short circuit happens
- To understand the function of fuses
- To make conclusions

**LESSON 11: Electrical Power**

**Aim:** electrical power

**Teacher objectives**

Content

- Definition of electrical power
- Calculation how much domestic electrical energy costs

Communication

- Introduction of specific vocabulary
- Use of *must*

Cognition

- Resolving problems through mathematical operations
- Predicting events through making comparisons
- Remembering the Ohm's law
- Making conclusions

Culture

- Approximation of concept of electrical power to the daily life of the students

### **Outcomes:**

At the end of the lesson students will be able to:

- To resolve problems of electrical power
- To predict events through making comparisons
- To use of must
- To use of phrases to make conclusions
- To valuate the cost of electrical energy in homes