

ELECTRICITY BASICS 2 **(основы электричества 2)**

Vocabulary

Word	Translation
Direct current (DC)	постоянный ток
Alternating current (AC)	переменный ток
polarity	полярность
switch	переключение; переключать
back and forth	назад и вперед
hertz	Герц
transformer	преобразователь, трансформатор
diode	диод
rectification	выпрямление, ректификация
capacitance	емкость; емкостное сопротивление
quantity	количество
electric field	электрическое поле
inductance	индуктивность
magnetic field	магнитное поле
impact	воздействие; влияние;
reactance	реактивное сопротивление
impedance	полное сопротивление; импеданс
assessing	оценивать; определять
voltage	электрическое напряжение;
direction	направление
continually	непрерывно
slow down	замедлять
capacitor	конденсатор
inductor	катушка индуктивности

Glossary

If something is **negative**, it has the electrical charge of an electron.

If something is **positive**, it has the electrical charge of a proton.

Direct current is a flow of electrical current that moves in just one direction.

Alternating current is a flow of electrical current that continually changes direction at a quick rate (скорость).

Polarity is the condition of having either a negative or positive electrical charge.

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A **hertz** is a measurement of frequency (частота). It measures the speed at which electrical current changes direction.

A **transformer** is a device that alters (изменять) the voltage of a flow of electricity.

Rectification is the process of AC switching to DC.

Capacitance is the ability to store an amount (количество) of electricity in an electric field.

Inductance is the ability to store electricity in a magnetic field.

Reactance is the opposition (противодействие) to a change in voltage or electrical current that is caused by capacitance or inductance.

Impedance is a measure of how hard it is for electricity to pass through a piece of electrical equipment.

Exercise 1: Listen the text, read and translate it

Introduction to Electricity

Direct current

Direct current is the type of electricity that comes on batteries. It moves from negative to positive.

Alternating current

Alternating current is when the polarity switches back and forth between positive and negative. The speed at which the polarity changes is measured in hertz. AC can be switched to DC using a transformer or diode. This process is known as rectification.

Additional Terms

Capacitance is the ability to store a quantity of electricity in an electric field. Inductance is the ability to store electricity in a magnetic field. The impact of capacitors and inductors on an alternating current is known as reactance. Impedance is a way of assessing how easily electricity passes through an electrical device.

Exercise 2: Questions about the text:

1. What is direct current?
2. What is the difference between direct current and alternating current?
3. In which direction does direct current move?
4. How is the speed of polarity changes in alternating current measured?
5. What process is used to convert AC to DC?
6. What is capacitance?
7. What is the difference between capacitance and inductance?

Exercise 3: True/False Questions:

1. Direct current comes from batteries.
2. Direct current moves from positive to negative.
3. Alternating current switches polarity back and forth.
4. The speed of polarity changes in AC is measured in volts.
5. AC can be converted to DC using a transformer or diode.
6. The process of converting AC to DC is called rectification.
7. Capacitance stores electricity in a magnetic field.
8. Inductance stores electricity in a magnetic field.
9. Reactance is the impact of capacitors and inductors on direct current.
10. Impedance measures how easily electricity passes through a device.

Exercise 4: Fill in the Blanks

Word Bank: rectification, negative, positive, impedance, transformer, batteries, hertz, reactance, capacitance, inductance, polarity

1. Direct current is the type of electricity that comes from _____.
2. Direct current moves from _____ to _____.
3. Alternating current switches _____ back and forth between positive and negative.
4. The speed at which polarity changes is measured in _____.
5. AC can be switched to DC using a _____ or diode.
6. The process of converting AC to DC is known as _____.
7. _____ is the ability to store a quantity of electricity in an electric field.
8. _____ is the ability to store electricity in a magnetic field.
9. The impact of capacitors and inductors on an alternating current is known as _____.
10. _____ is a way of assessing how easily electricity passes through an electrical device.

Exercise 5: Match the terms with their definitions:

Term	Definition
1. Direct current	A. The ability to store electricity in an electric field
2. Alternating current	B. The ability to store electricity in a magnetic field
3. Rectification	C. Electricity that moves in one direction

4. Capacitance	D. Electricity that switches polarity back and forth
5. Inductance	E. The process of converting AC to DC
6. Reactance	F. A measure of how hard it is for electricity to pass through equipment
7. Impedance	G. The opposition to change in voltage caused by capacitance or inductance

Exercise 6: Word Bank Fill-in

Word Bank: capacitance, reactance, impedance, rectification, inductance

1. The process of AC switching to DC is called _____.
2. _____ is the ability to store electricity in an electric field.
3. _____ is the ability to store electricity in a magnetic field.
4. The impact of capacitors and inductors on AC is known as _____.
5. _____ is a measure of how hard it is for electricity to pass through equipment.

Exercise 7: Correct the errors in these sentences:

1. "Direct current moves from positive to negative."
2. "Alternating current is measured in amperes."
3. "Capacitance stores electricity in a magnetic field."
4. "Rectification is the process of converting DC to AC."
5. "Impedance stores electricity in an electric field."

Exercise 8: Find the word that doesn't belong in each group:

1. a) Direct current b) Alternating current c) Transformer d) Battery
2. a) Capacitance b) Inductance c) Reactance d) Ampere
3. a) Negative b) Positive c) Polarity d) Hertz
4. a) Rectification b) Transformer c) Diode d) Capacitance
5. a) Volt b) Ampere c) Ohm d) Reactance

Exercise 9: Translate the following terms into English:

1. Постоянный ток - _____
2. Переменный ток - _____
3. Полярность - _____
4. Герц - _____
5. Трансформатор - _____
6. Выпрямление - _____

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7. Емкость - _____
8. Индуктивность - _____
9. Реактивное сопротивление - _____
10. Импеданс - _____

Exercise 10: Match the unit with what it measures:

Unit	What it Measures
1. Ampere	A. Electrical power
2. Volt	B. Electrical resistance
3. Ohm	C. Electrical current
4. Watt	D. Frequency
5. Hertz	E. Electric force / Voltage

Exercise 11: Complete the Table

Unit	Symbol	Measures	Named After
	A		André-Marie Ampère
	V		Alessandro Volta
	Ω		Georg Ohm
	W		James Watt
	Hz		Heinrich Hertz

Exercise 12: Choose the correct unit for each description:

1. This unit measures how much electricity flows through a wire. (Ampere / Volt)
2. This unit measures the "push" or force of electricity. (Ohm / Volt)
3. This unit measures how much a material resists electricity. (Ohm / Watt)
4. This unit measures the rate of energy transfer. (Watt / Hertz)
5. This unit measures how fast electricity changes direction. (Hertz / Ampere)
6. This unit is used to measure the power of a light bulb. (Watt / Volt)
7. This unit measures frequency in AC circuits. (Hertz / Ohm)

Exercise 13: Fill in the Table with Symbols

Unit	Symbol
Ampere	_____
Volt	_____
Ohm	_____
Watt	_____
Hertz	_____

Exercise 14: Listen to the dialogue and fill in the missing words

Alex: Hi, Emma! I heard you're learning about 1 _____. What have you studied so far?

Emma: Hi, Alex! Yes, it's really interesting. We started with the basics — direct 2 _____ and alternating current.

Alex: What's the difference between them?

Emma: Direct current, or 3 _____, comes from batteries. It moves in just one direction — from negative to 4 _____.

Alex: That sounds simple. What about alternating current?

Emma: Alternating current, or 5 _____, is different. It switches polarity back and forth between positive and negative.

Alex: So it changes direction all the time?

Emma: Exactly! The speed at which it changes is measured in 6 _____.

Alex: That's fascinating! Can AC be converted to DC?

Emma: Yes, it can. You can use a 7 _____ or a diode. This process is called rectification.

Alex: I see. What other terms do you study?

Emma: We also learn about capacitance and 8 _____. Capacitance is the ability to store electricity in an electric field.

Alex: And inductance?

Emma: Inductance is the ability to store electricity in a 9 _____ field. They both affect alternating current.

Alex: How do they affect it?

Emma: The impact of capacitors and inductors on AC is called reactance. There's also 10 _____.

Alex: What's impedance?

Emma: Impedance is a way of assessing how easily electricity passes through an electrical 11 _____.

Alex: Wow, that's a lot of new terms! But it sounds really useful.

Emma: It is! Understanding these concepts helps with so many things — from fixing electronics to designing 12 _____.

Alex: I'd love to learn more about this. Maybe I'll join the class too!

Emma: You definitely should! It's a great subject.

Useful Phrases from the Dialogue:

English	Russian
What have you studied so far?	Что ты уже изучила?
What's the difference between them?	В чем разница между ними?
That sounds simple.	Звучит просто.

So it changes direction all the time?	Значит, оно все время меняет направление?
Exactly!	Именно!
That's fascinating!	Это увлекательно!
I see.	Понятно.
What other terms do you study?	Какие еще термины вы изучаете?
How do they affect it?	Как они на это влияют?
Wow, that's a lot of new terms!	Вау, это много новых терминов!
It sounds really useful.	Это звучит очень полезно.
I'd love to learn more about this.	Я бы хотел узнать об этом больше.
You definitely should!	Тебе обязательно стоит!

Exercise 15: True/False Questions about the Dialogue

1. Emma is learning about electricity.
2. Emma started with the basics — direct current and alternating current.
3. Direct current comes from power plants.
4. Direct current moves from negative to positive.
5. Alternating current never changes direction.
6. The speed of polarity changes in AC is measured in hertz.
7. AC can be converted to DC using a transformer or diode.
8. Capacitance is the ability to store electricity in a magnetic field.
9. Inductance is the ability to store electricity in a magnetic field.
10. Impedance is a measure of how easily electricity passes through a device.

Exercise 16: Write your dialogue based on the provided templates.

Dialogue Template 1: Asking About a Subject

A: Hi, [Name]! I heard you're learning about [subject]. What have you studied so far?

B: Hi, [Name]! Yes, it's really interesting. We started with the basics — [topic 1] and [topic 2].

A: What's the difference between them?

B: [Topic 1] is [definition/explanation]. [Topic 2] is [definition/explanation].

A: That sounds simple. What about [topic 3]?

B: [Topic 3] is different. It [description/explanation].

A: So it [does something]?

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B: Exactly! [Additional explanation].

A: That's fascinating! Can [topic 3] be [verb]?

B: Yes, it can. You can use [tool/device] to [action]. This process is called [process name].

A: I see. What other terms do you study?

B: We also learn about [term 1] and [term 2]. [Term 1] is [definition]. [Term 2] is [definition].

A: How do they affect [something]?

B: The impact of [term 1] and [term 2] on [something] is called [term 3].

A: What's [term 3]?

B: [Term 3] is [definition/explanation].

A: Wow, that's a lot of new terms! But it sounds really useful.

B: It is! Understanding these concepts helps with so many things — from [application 1] to [application 2].

A: I'd love to learn more about this. Maybe I'll join the class too!

B: You definitely should! It's a great subject.

Dialogue Template 2: Recommending a Class

A: I'm thinking about taking a class on [subject]. Do you know anything about it?

B: Yes! I'm taking [class name] right now. It's really interesting!

A: What do you study in it?

B: We study [topic 1], [topic 2], and [topic 3]. We also learn about [additional topics].

A: Is it difficult?

B: It can be challenging, but the teacher explains everything clearly.

A: What's the most interesting thing you've learned?

B: I think [topic/term] is the most fascinating. [Explanation].

A: What else do you learn?

B: We also learn about [term 1] and [term 2]. [Term 1] is [definition]. [Term 2] is [definition].

A: How does it all work together?

B: They work together to [purpose/function].

A: That sounds great! I think I'll sign up.

B: You definitely should! You'll learn a lot and enjoy it.

Dialogue Template 3: Explaining Concepts to a Friend

A: Can you explain [topic] to me?

B: Sure! [Topic] is [definition/explanation].

A: What about [related topic]?

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B: [Related topic] is different. It [explanation].

A: So [topic 1] and [topic 2] are related?

B: Yes, they are. [Topic 1] [does something], while [topic 2] [does something else].

A: How can I remember the difference?

B: Just remember: [simple rule/mnemonic].

A: That's helpful! What else should I know?

B: You should also know about [term 1] and [term 2]. They are [definitions].

A: So [term 1] is [definition], and [term 2] is [definition]?

B: Exactly! You've got it.

A: Thanks for explaining! This is really helpful.

B: No problem! Happy to help.

Useful Phrases for Dialogue Templates

English	Russian
What have you studied so far?	Что ты уже изучил/а?
What's the difference between them?	В чем разница между ними?
That sounds simple/complicated.	Звучит просто/сложно.
So it [does something]?	Значит, оно [делает что-то]?
Exactly!	Именно!
That's fascinating!	Это увлекательно!
I see.	Понятно.
What other terms do you study?	Какие еще термины вы изучаете?
How do they affect [something]?	Как они влияют на [что-то]?
Wow, that's a lot of new terms!	Вау, это много новых терминов!
It sounds really useful.	Это звучит очень полезно.
I'd love to learn more about this.	Я бы хотел узнать об этом больше.
You definitely should!	Тебе обязательно стоит!
Can you explain [topic] to me?	Можешь объяснить мне [тему]?
That's helpful!	Это полезно!
What else should I know?	Что еще мне нужно знать?
You've got it!	Ты понял/а!
Thanks for explaining!	Спасибо за объяснение!
Happy to help!	Рад помочь!

Exercise 17: Report: Learning About Electricity

Word Bank: reactance, Alternating current, transformer, useful, Direct current, attended, Capacitance, hertz, negative, Inductance, switches, rectification, positive, batteries, Impedance

1. I _____ a course on electricity basics.
2. The course covered two main types of electricity: _____ and _____.
3. Direct current comes from _____ and moves from _____ to _____.
4. Alternating current _____ polarity back and forth.
5. The speed of polarity changes is measured in _____.
6. AC can be converted to DC using a _____ or diode.
7. This conversion process is called _____.
8. _____ is the ability to store electricity in an electric field.
9. _____ is the ability to store electricity in a magnetic field.
10. _____ The impact of capacitors and inductors on AC is called _____.
11. _____ is a measure of how hard it is for electricity to pass through equipment.
12. _____ The course was very _____ and helped me understand important concepts.

Exercise 18: Instruction: How to Understand Electricity Basics

Word Bank: alternating current, batteries, negative, positive, polarity, hertz, transformer, rectification, Capacitance, Inductance, reactance, Impedance, direct current

1. First, learn about the two main types of electricity: _____ and _____.
2. Remember that direct current (DC) comes from _____ and moves from _____ to _____.
3. Understand that alternating current (AC) switches _____ back and forth, measured in _____.
4. Know that AC can be converted to DC using a _____ or diode in a process called _____.
5. Study _____ as the ability to store electricity in an electric field.
6. Learn that _____ is the ability to store electricity in a magnetic field.

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7. Understand that the impact of capacitors and inductors on AC is called _____.
8. Finally, study _____ as a measure of how easily electricity passes through equipment.