



⚡ Lesson Plan: Electricity

Grade Level: 6

Subject: Physical Science

Duration: 45–60

NGSS MS-PS1-1: Develop models to describe the atomic composition of simple molecules and extended structures.

Learning Objectives

By the end of this lesson, students will be able to:

- **Explain** the difference between static electricity and electric current.
- **Describe** the relationship between voltage, current, and resistance using Ohm's Law.
- **Identify** the components of series and parallel circuits and explain how they function.



PREVIEW

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- **Series Circuit:** A circuit with only one path for electric current to flow. The current must flow through all the circuit components in sequence. If any component fails, the entire circuit stops working.
- **Parallel Circuit:** A circuit with at least two independent paths for current to flow. If one component fails, current can still flow through the other paths, so the remaining components continue to work.
- **Conductor:** A material that allows electric charge to flow easily through it. Metals like copper and aluminum are good conductors because they have low resistance.



- **Insulator:** A material that resists the flow of electric charge. Materials like rubber, wood, and plastic are insulators because they have high resistance and prevent electricity from flowing easily.

 Materials Needed: (all links are included in this PDF)

- Printed copies of the Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-electricity-2.pdf>)
- Activity Lesson handouts (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-electricity-2-4.pdf>)
- Worksheet for assessment (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-electricity-2-0.pdf>)
- Vocabulary matching worksheet (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-electricity-2-4.pdf>)



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[Electricity 2-4.pdf](#)

Step 2: Direct Instruction (15 minutes)

- Use the Study Guide to explain the difference between static electricity and electric current, emphasizing that current is the continuous flow of electrons. (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-electricity-2.pdf>)
- Demonstrate a simple circuit using a battery, wires, and a light bulb. Show how completing the circuit allows current to flow and lights the bulb, while breaking the circuit stops the flow.



- Introduce Ohm's Law (Resistance = Voltage / Current) and the power formula (Power = Voltage $\times$ Current) using the Activity Lesson diagrams, and work through one example calculation on the board. (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-electricity-2-4.pdf>)
- Explain the difference between series and parallel circuits using the circuit diagrams, highlighting that series circuits have one path and parallel circuits have multiple independent paths. (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-electricity-2-4.pdf>)

Step 3: Guided Practice (15 minutes)

- Distribute the Activity Lesson handouts and work through the fill-in-the-blank section as a class, reinforcing key vocabulary terms. (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-electricity-2-4.pdf>)
- Guide students through solving the Ohm's Law and power calculation problems on the Activity Lesson, checking answers together. (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-electricity-2-4.pdf>)



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- Distribute the assessment worksheet and have students complete the multiple-choice questions independently. (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-electricity-2-0.pdf>)
- Review the worksheet answers as a class, addressing any misconceptions about circuit types, Ohm's Law, or electrical safety. (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-electricity-2-0.pdf>)
- Ask students to classify everyday electrical devices (flashlight, house wiring, holiday lights) as using series or parallel circuits and explain their reasoning.



💡 Differentiation Strategies

For advanced learners:

- Challenge advanced learners to research and present on how electrical power is generated and distributed in a power grid, connecting voltage, current, and resistance concepts to real-world applications.
- Have students design and sketch a more complex circuit that includes both series and parallel components, then calculate the total resistance and current flow.

For learners needing support:

- Provide students needing support with a pre-labeled circuit diagram showing the path of current flow, and use color-coded wires during the hands-on activity to help them visualize connections.



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📚 Complete List of Available Resources:

- NewPathWorksheets: Electricity (<https://newpathworksheets.com/science/grade-6/electricity-2>)
- Study Guide PDF (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-electricity-2.pdf>)
- Activity Lesson PDF (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-electricity-2-4.pdf>)



- Worksheet PDF 1 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-electricity-2-0.pdf>)
- Worksheet PDF 2 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-electricity-2-1.pdf>)
- Worksheet PDF 3 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-electricity-2-2.pdf>)
- Worksheet PDF 4 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-electricity-2-3.pdf>)
- Vocabulary PDF 1 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-electricity-2-1.pdf>)
- Vocabulary PDF 2 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-electricity-2-2.pdf>)



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ELECTRICITY

Charged Particles

Electric charges are either positive (+) or negative (-). The **protons** in an atom have a positive charge and the **electrons** around the atom have a negative charge.

If two particles have similar charges, they repel each other, but, if they have opposite charges, they attract each other. This explains why an atom holds together. The positively charged protons in the nucleus exert a strong attraction for the negatively charged electrons that surround it.



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LESSON CHECKPOINT: *What is the difference between an electrical current and electricity?*

Charged Particles in Motion

This flow of electrons from one place to another is called **electricity**, an **electrical current** or **electrical energy**. In order for this flow to occur, there has to be an electrical **circuit** or pathway. As long as the circuit is complete, electricity flows, but when the circuit is broken, the current stops.



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What are the terms for electric potential, electric current and electrical resistance?



Ohm's Law

The mathematical relationship between volts, amps, and ohms is called **Ohm's Law**. The formula for this law is shown below:

$I = E/R$ or *amperage equals voltage divided by resistance*.

Notice how this law confirms what we were just saying about electrical resistance. If the resistance increases and the potential does not change, the result is a decrease in amperage.

Types of Circuits

The two types of electrical circuits are **series** and **parallel**. The diagram below shows both types.

Notice that in a series circuit, if a break occurs anywhere in the circuit,



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LESSON CHECKPOINT:

What is the difference between a series and a parallel circuit?

Electrical Power

Electrical **power** is measured in units called **watts**.

The formula for calculating wattage is shown below:

$$\text{Power} = \text{voltage} \times \text{current} \quad \text{OR} \quad P = V \times I$$

The formula tells us that by increasing either the potential or the actual amount of current, we will increase the wattage.

Batteries

Batteries are **electrochemical** cells. In an electrochemical cell, chemical energy is converted to electrical energy. In the dry cell battery shown below, an **electrolyte** causes a chemical reaction with the electrodes, zinc, and carbon. This reaction causes electrical



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LESSON CHECKPOINT:
How does a dry cell battery work?



Safety Reminders

While working with electricity, safety should always be kept in mind. Many people are killed every year, especially in Florida, by lightning.

- To avoid being struck by lightning, remember to stay away from tall trees and other tall structures if you are outside during a storm.

If you are inside a home, you are normally safe from lightning but you still could be hurt by electric shocks or short circuits.

- Since water conducts electricity, using dry hands while using electrical appliances is important.
- Make sure your home is equipped with **fuses** and **circuit breakers** that break the electrical circuit if too much current starts to flow.

LESSON CHECKPOINT:

Why should you make sure your hands are not wet



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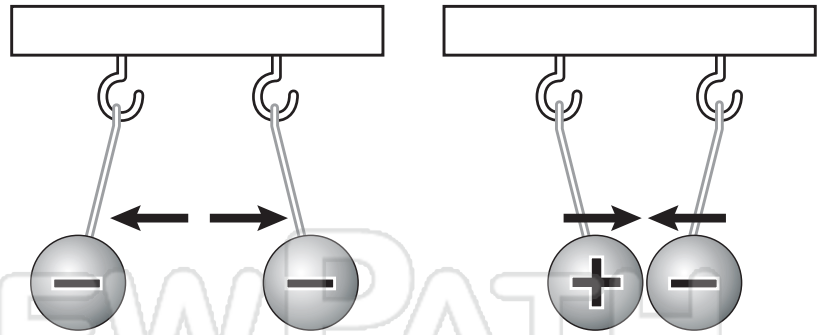




Electricity

Name _____ Class _____ Date _____

Atoms are made of positively charged **protons**, negatively charged **electrons** and **neutrons** which carry no charge. Objects with like charges **repel** each other, while objects with opposite charges **attract** each other.



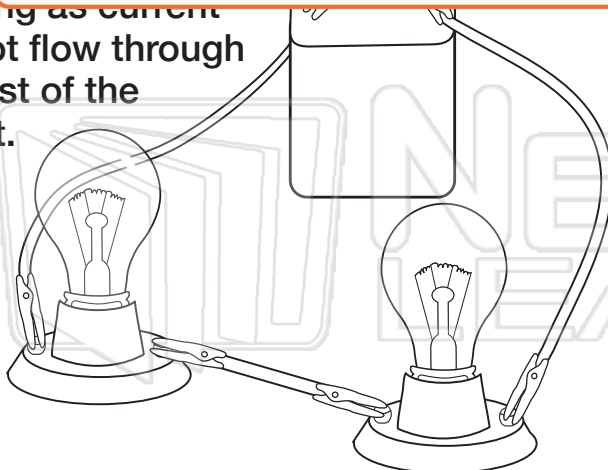
A flow of electric charges is called **electric current**. The rate of electric current, expressed in **amps (A)**, measures the amount of charges that flow through a material past a given point per second. There are two kinds of electric current – **Alternating Current (AC)** and **Direct Current (DC)**.



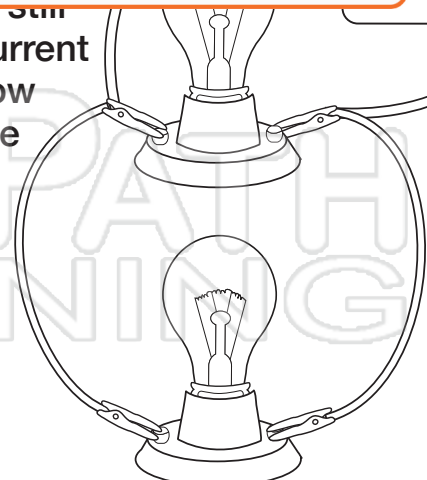
PREVIEW

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A **series** **electric** circuit is one in which the current has only one path to follow. If any part of the circuit is broken, the current cannot flow through the rest of the circuit.



Others will still work as current can still flow through the rest of the circuit.





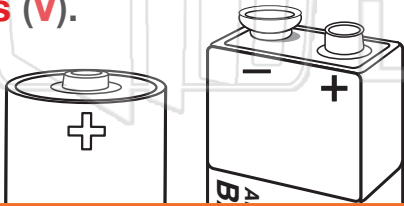
Electricity

Name _____ Class _____ Date _____

The rate of **electric current**, expressed in **amps (A)**, measures the amount of charges that flow through a material past a given point per second. The letter **I** is used as the symbol for **current** in equations.

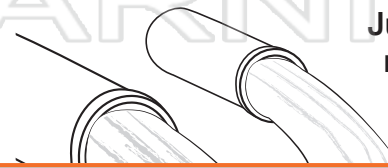
Voltage

Voltage is the electrical force, or “**pressure**”, that causes **current** to flow in a circuit. **Voltage** is measured in **volts (V)**.



Resistance

Resistance is the **opposition** to the flow of electricity in a circuit. Resistance is measured in **ohms (Ω)**. In equations, the symbol for resistance is the letter **R**.



Just as water has less resistance flowing through a wide pipe than a narrow one,



Ohm's
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1854)
relati
curre

PREVIEW

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units:

Ω = Resistance (ohms)

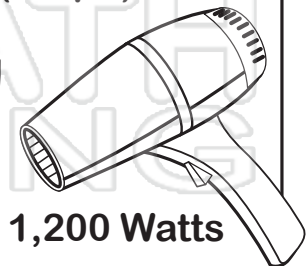
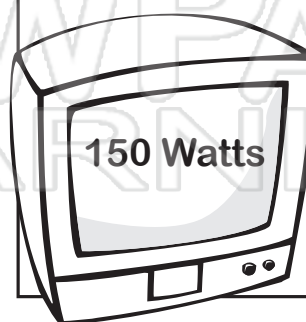
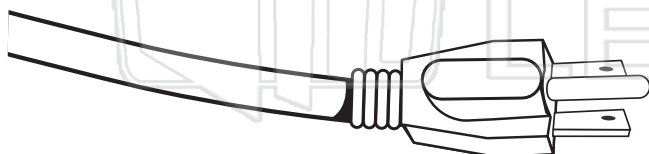
V = Voltage (volts)

A = Current (amps)

W = Power (watts)

V = Voltage (volts)

A = Current (amps)





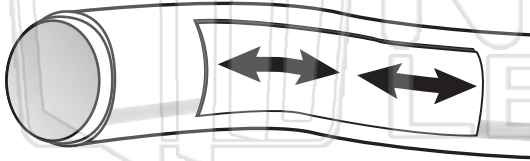
Electricity

Name _____ Class _____ Date _____

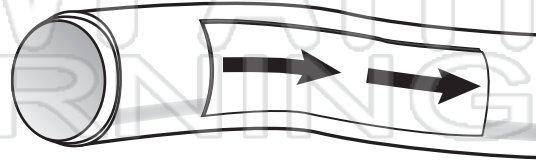
Fill in the blanks.

A flow of electric charges is called _____.

The rate of _____, expressed in _____, measures the amount of _____ that flow through a material past a given point per second.



The charges in



The charges in

flow
co



PREVIEW

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A _____ circuit has only one path for electric current to flow. The current must flow through all the circuit components. If any of the bulbs fail, the others will _____.

Current in a _____ circuit has at least two independent paths to flow. If any of the bulbs fail, the others will _____.



Electricity

Name _____ Class _____ Date _____

Fill in the blanks. Use the equations to answer the questions.

The rate of electric current, expressed in _____ (**A**), measures the amount of charges that flow through a material past a given point per second. The letter **I** is used as the symbol for current in equations.

_____ is the electrical force, or “pressure”, that causes current to flow in a circuit. _____ is measured in volts (**V**).

Resistance is the _____ to the flow of electricity in a circuit.

Resistance is measured in _____ (Ω). In equations, the symbol for resistance is the letter **R**.

between

Electrical
forms

Calculate

A watt



PREVIEW

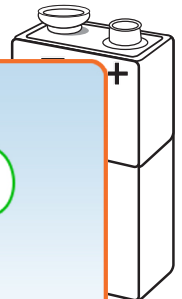
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A 55 watt bulb is plugged into a 110-volt electrical outlet. Calculate the **amperes** being used by the lightbulb.

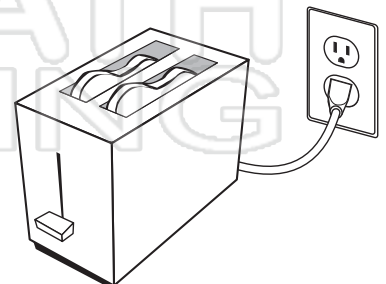
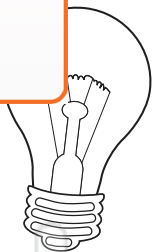
_____ **A**

An electric toaster is using 2 amperes and is plugged into a 110-volt electrical socket. What is the **wattage** of the toaster?

_____ **W**



Power
(**W**).





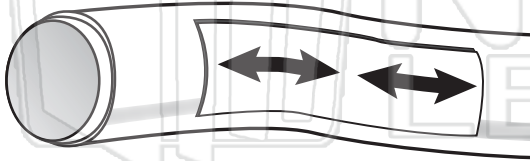
Electricity

Answer Key

Fill in the blanks.

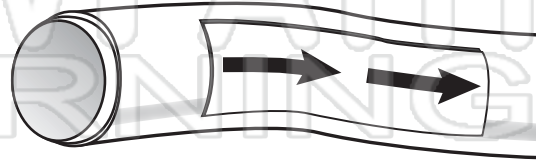
A flow of electric charges is called electric current.

The rate of electric current, expressed in amps (A), measures the amount of charges that flow through a material past a given point per second.



The charges in

Alternating



The charges in

Direct

flow
con



PREVIEW

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A series circuit has only one path for electric current to flow. The current must flow through all the circuit components. If any of the bulbs fail, the others will

Current in a parallel circuit has at least two independent paths to flow. If any of the bulbs fail, the others will



Electricity

Answer Key

Fill in the blanks. Use the equations to answer the questions.

The rate of electric current, expressed in amps (A), measures the amount of charges that flow through a material past a given point per second. The letter **I** is used as the symbol for current in equations.

Voltage is the electrical force, or “pressure”, that causes current to flow in a circuit. Voltage is measured in volts (V).

Resistance is the opposition to the flow of electricity in a circuit.

Resistance is measured in ohms (Ω). In equations, the symbol for resistance is the letter **R**.

between

Electrical
forms

Calculate

A watt



PREVIEW

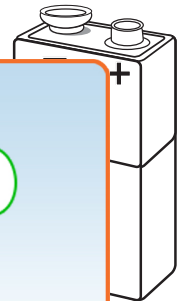
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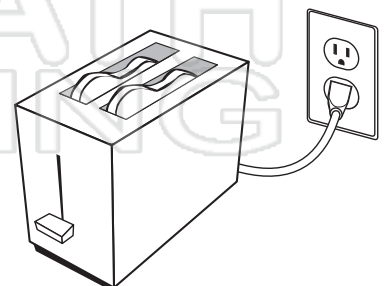
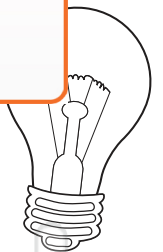
0.5 A

An electric toaster is using 2 amperes and is plugged into a 110-volt electrical socket. What is the **wattage** of the toaster?

220 W



Power
(W).





Name _____ Class _____ Date _____

1

A **watt** is a measure of electrical _____.

- A** resistance
- B** work
- C** power
- D** current

**2**

In the early 1800s, German physicist George Ohm formulated Ohm's law through his study of electric current. Using **Ohm's law**, calculate the resistance in ohms (Ω) if the current is **6** amperes and the voltage is **12**.

- A** $2\ \Omega$
- B** $3\ \Omega$
- C** $6\ \Omega$
- D** $12\ \Omega$

$$R = \frac{V}{I}$$

3

$I = V/R$ is the **same formula** as _____.

- A** $I = R/V$
- B** $V = I \times R$
- C** $R \times V = I$
- D** $R = R \times V$

**4**

Use the **wattage** in the picture to calculate the **amperes** being used by the lightbulb shown below. The **bulb in the picture** is plugged into a **110-volt** electrical outlet.

- A** 4 A

**5**

PREVIEW

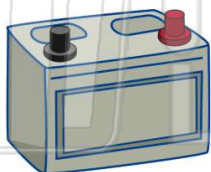
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9

The function of a **car battery** is to _____.

- A** start the car
- B** power the brakes
- C** power the engine
- D** use only for emergencies

**10**

A **2-volt** light bulb does not work with a **1-volt** battery. What is the reason for this?

- A** there is not enough resistance
- B** there are too many amperes
- C** there is not enough electrical potential
- D** there is too much voltage



Name _____ Class _____ Date _____

1

A **watt** is a measure of electrical _____.

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- B** work
- C** power
- D** current

**(C)****2**

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- D** $12\ \Omega$

$$R = \frac{V}{I}$$

(A)**3**

$I = V/R$ is the **same formula** as _____.

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- B** $V = I \times R$
- C** $R \times V = I$
- D** $R = R \times V$

**(B)****4**

Use the **wattage** in the picture to calculate the **amperes** being used by the lightbulb shown below. The **bulb in the picture** is plugged into a **110-volt** electrical outlet.

- A** 4 A

**(C)****5****(B)**

PREVIEW

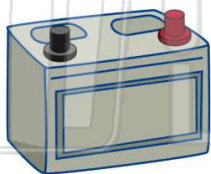
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(C)**9**

The function of a **car battery** is to _____.

- A** start the car
- B** power the brakes
- C** power the engine
- D** use only for emergencies

**(A)****10**

A **2-volt** light bulb does not work with a **1-volt** battery. What is the reason for this?

- A** there is not enough resistance
- B** there are too many amperes
- C** there is not enough electrical potential
- D** there is too much voltage

(C)



Name _____ Class _____ Date _____

1

What is the **function** of the **switch** shown in the diagram below?

- A** it allows current to pass through it
- B** it provides power for the bulb
- C** it increases the voltage
- D** it keeps the battery working

**2**

In the diagram below, if the bulb was **taken out** of the socket, how much **current** would pass through **point #1**?

- A** all
- B** most
- C** some
- D** none

**3**

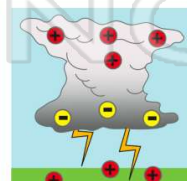
In the picture below, if the **battery** was replaced with a **newer** one with the same voltage on the label, one possible result would be _____.

- A** the bulb burning out

**4**

What is the **cause of the lightning** in the diagram below?

- A** rain
- B** thunder
- C** static electricity

**5**

PREVIEW

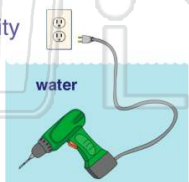
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9

What is most **unsafe** about using an **electric drill** in this situation?

- A** working with electricity near water
- B** using an electrical tool
- C** getting wet
- D** the drill will rust

**10**

Why is working with **electricity near water dangerous**?

- A** it wastes energy
- B** water creates extra resistance
- C** water conducts electricity
- D** water decreases electric current





Name _____ Class _____ Date _____

1

What is the **function** of the **switch** shown in the diagram below?

- A it allows current to pass through it
- B it provides power for the bulb
- C it increases the voltage
- D it keeps the battery working



A

2

In the diagram below, if the bulb was **taken out** of the socket, how much **current** would pass through **point #1**?

- A all
- B most
- C some
- D none



D

3

In the picture below, if the **battery** was replaced with a **newer** one with the same voltage on the label, one possible result would be _____.

- A the bulb burning out

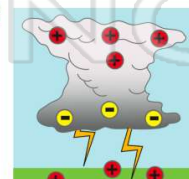


C

4

What is the **cause** of the **lightning** in the diagram below?

- A rain
- B thunder
- C static electricity



C

5



D

PREVIEW

7

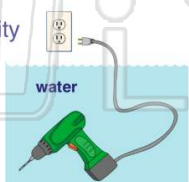
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B

9

What is most **unsafe** about using an **electric drill** in this situation?

- A working with electricity near water
- B using an electrical tool
- C getting wet
- D the drill will rust



A

10

Why is working with **electricity** near **water** **dangerous**?

- A it wastes energy
- B water creates extra resistance
- C water conducts electricity
- D water decreases electric current



C



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Battery

Electrolyte

Current

Electricity

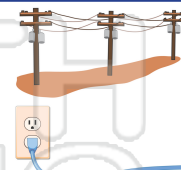
Circuit

Electrochemical cell

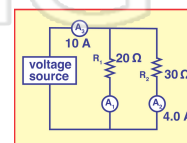
Amperage

Ohm

1. _____ - the flow of electrical charge; another name for an electric current



2. _____ - the term used to describe the amount of electrical current in a circuit



3. _____
electr



4. _____

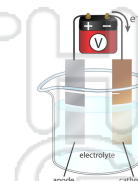
5. _____
point t

6. _____
electr

PREVIEW

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7. _____ - the chemical in a battery that causes the chemical reaction needed to produce electricity



8. _____ - the unit used to describe the amount of electrical resistance





Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Battery

Electrolyte

Current

Electricity

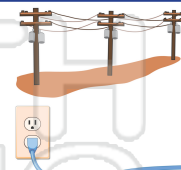
Circuit

Electrochemical cell

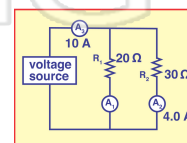
Amperage

Ohm

1. **electricity** - the flow of electrical charge; another name for an electric current



2. **amperage** - the term used to describe the amount of electrical current in a circuit



3. bat



4. circ

5. cur

another

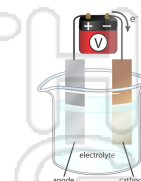
6. ele

electric

PREVIEW

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7. **electrolyte** - the chemical in a battery that causes the chemical reaction needed to produce electricity



8. **Ohm** - the unit used to describe the amount of electrical resistance

