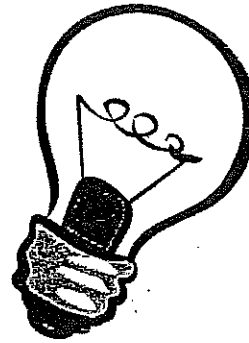


Test on Thursdays March 19th

## Parents Guide to Electricity

Students are having a wonderful time exploring the world of electricity through reading, research, and experiments. We are learning not only what electricity is, but how to make it work. Our CMS for this unit will be on **Friday, Feb. 28**



### Vocabulary

electricity	conductor	insulator	charge
circuit	current	parallel circuit	series circuit
open circuit	closed circuit	resistor	
magnetic field	electromagnet	energy	

### People to Know

Thomas Edison

Benjamin Franklin

Michael Faraday

### Essential Questions

- What are some sources we use to produce electricity?
- What is the difference between a conductor and an insulator?
- What are closed and open circuits? How does electricity flow in a series and parallel circuit?
- What is the relationship between magnetism and electricity?
- Who are the major contributors to our understanding of electricity?

### Important Information

#### Conductors, Insulators, and Resistors

- Materials that electricity flows through are known as **conductors**. Good conductors allow electricity to flow easily, but poor conductors do not allow electricity to flow well.
- **Insulators** are materials that don't let electricity flow at all. We often use the term "**resistance**" to describe how well electricity will flow in a material. Electrical wires in our homes contain a conductor, like a metal such as copper or aluminum, wrapped in the protective coating of an insulator, like rubber or plastic.

#### Types of Circuits

- A **circuit** must have an energy source (such as from a battery), a wire, and a device that will use the electricity (like an appliance or a light bulb).
- A **closed circuit** allows the electricity to flow from the battery, through the wire, to the appliance or light bulb, and back to the battery.

- An **open circuit** is “broken” and does not let the electricity complete its travel through the entire circuit. A pathway taken by an electric current is a circuit.
- In a **series circuit** there is only one pathway for the current, but in a **parallel circuit** there are two or more pathways for it.

### **Static Electricity**

- A type of electricity that is produced naturally is static electricity. Static is produced by friction when certain objects rub together, building an electric charge between them. Lightning is the discharge of static electricity in the atmosphere.

### **Electricity and Energy**

- Electricity has many uses in our homes.
- Electrical energy can be transformed into light, heat, sound, and mechanical energy that can be used to run appliances such as ovens, television sets, and stereos.

### **Electricity and Magnetism**

- Electricity is related to magnetism. A current running through a wire and a magnet both produce a magnetic field. We can produce a magnet that can be “turned on and off” by wrapping a current carrying wire around a nail. When current moves through the wire, the moving magnetic field creates an electric current. We use electromagnets in many everyday devices, including computer disk drives, electric motors and doorbells.

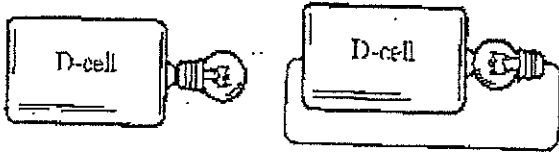
### **Historical Contributions**

- Historical contributions to the study and understanding of electricity. Benjamin Franklin, Thomas Alva Edison, and Michael Faraday were instrumental in the sciences of electricity, recording sound and the light bulb and the understanding of electromagnetism.
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# Electricity Practice Test

Choose the best answer for numbers 1-29

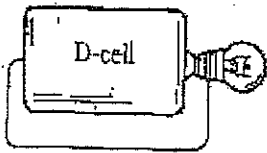
Which diagram shows a complete circuit?



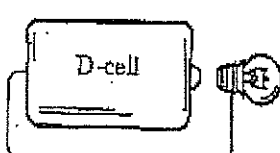
A



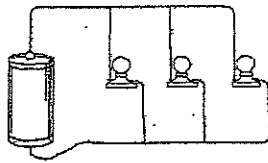
B



C



D



What would happen if you removed a bulb from the circuit above?

- A The other bulbs would go out.
- B The other bulbs would remain lit.
- C The other bulbs would become brighter.
- D The other bulbs would become dimmer

What is an electromagnet?

- A a place on a magnet where magnetism is strongest
- B a material through which electric current does not pass
- C a small magnet that turns freely
- D a magnet made when an electric current flows through a wire wrapped around a core of iron

4 Mary flips on the light switch in her bedroom. Three light bulbs usually turn on, but this time, only two turn on. Because the other bulbs light up when one does not, the circuit must be

- A a series circuit
- B an open circuit
- C a parallel circuit
- D a powerful circuit

5 When John got his clothes out of the dryer, he heard crackling noises and felt sharp little shocks on his fingers. What type of energy caused these effects?

- A a chemical reaction
- B static electricity
- C heat energy
- D light energy

6 What is an insulator of electricity?

- A the measure that electric current passes through easily
- B the measure of how well electricity flows through an object
- C a material that electric current does not pass through easily
- D the change of electrical energy to heat energy

7 Rubber is an example of which of the following?

- A an insulator
- B a magnet
- C a conductor
- D a superconductor

## Electricity Practice Test

During the winter, David's room is very cold so he uses an electric blanket to stay warm. What type of energy would the electric blanket provide?

- A sound energy
- B heat energy
- C mechanical energy
- D light energy

What is a conductor of electricity?

- A a substance that stores electricity
- B a substance that an electric charge passes through
- C a substance that reverses electron flow
- D a substance that does not let an electric charge pass through

What happens when the current flowing through an electromagnet is turned off?

- A the electromagnet loses its magnetic properties.
- B the magnetism increases in the electromagnet
- C the core of the electromagnet falls out.
- D there is no change, the current is unnecessary

A circuit which allows a current to flow through it is \_\_\_\_\_.

- A open
- B closed
- C electron
- D magnetic

Jack took apart his remote control car. He noticed the motor was made of metal wrapped in copper wire. The motor is an example of \_\_\_\_\_.

- A an electromagnet
- B a circuit breaker
- C a series circuit
- D a compass

13 We have light bulbs today because a scientist discovered how to change electrical energy into light energy. Who was he?

- A Ben Franklin
- B Michael Faraday
- C Thomas Alva Edison
- D Albert Einstein

14 Michael Faraday invented the first generator and electric motor. From this we can tell that Faraday was interested in understanding \_\_\_\_\_.

- A static electricity and friction
- B magnetism and electricity
- C circuits and batteries
- D lightning and light bulbs

15 Which of these is a good conductor of electricity?

- A copper
- B wood
- C glass
- D plastic

16 Which object would make a good conductor?

- A a pencil
- B a paper plate
- C a key
- D a piece of string

17 Which of these is used to open and close a circuit?

- A a bulb
- B a switch
- C a battery
- D a terminal

## Electricity Practice Test

Electricity is energy made from the movement of \_\_\_\_\_ through a wire.

- A water
- B air
- C electrons
- D protons

The path along which an electric current moves is \_\_\_\_\_.

- A an electromagnet
- B an electric charge
- C a circuit
- D a battery

Static electricity occurs when \_\_\_\_\_.

- A objects are electrically balanced
- B objects become unbalanced electrically
- C objects push away from each other
- D resistance occurs between objects

Static electricity would make clothes put in the dryer \_\_\_\_\_.

- A stay apart from each other
- B be completely dry
- C stick together
- D shrink in size

Electrical energy makes the most light energy in a \_\_\_\_\_.

- A vacuum cleaner
- B television
- C blender
- D stereo

23. Electric pencil sharpeners use electricity to make what kind of energy?

- A heat
- B mechanical
- C solar
- D light

24. An electromagnet's strength can be found by testing \_\_\_\_\_.

- A how much it weighs
- B which direction it points
- C how many nails it can lift
- D the distance between poles

25. What is a D cell?

- A A source of electrical energy
- B A source of light energy
- C A source of heat energy
- D Any hard, round, metal object

26. What did Benjamin Franklin discover was electricity?

- A lightning
- B thunder
- C a key
- D gravity

27. A material that is an insulator \_\_\_\_\_.

- A stores electrical energy
- B generates electrical energy
- C stops the flow of electricity
- D allows electricity to flow

28. Which object is an insulator?

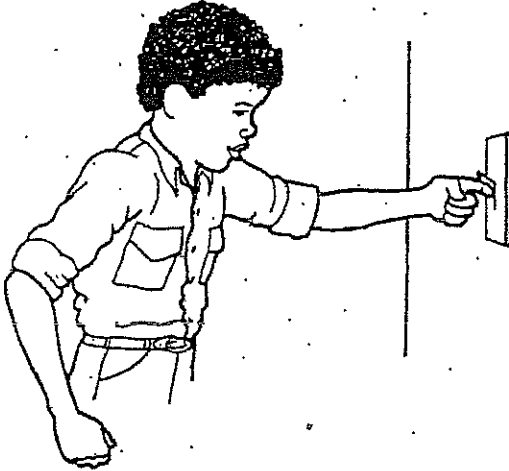
- A a wooden spoon
- B a silver fork
- C a gold ring
- D a safety pin

# Electricity Practice Test

Electricity from \_\_\_\_\_ occurs naturally.

- A falling water
- B fossil fuels
- C lightning
- D wind

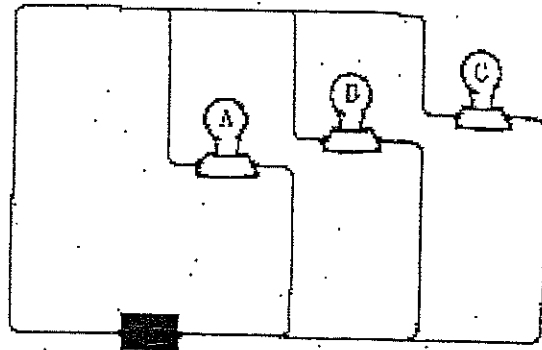
Use the picture to find the correct answer to number 30



When the light is turned on, the circuit is \_\_\_\_\_.

- A open
- B broken
- C closed
- D incomplete

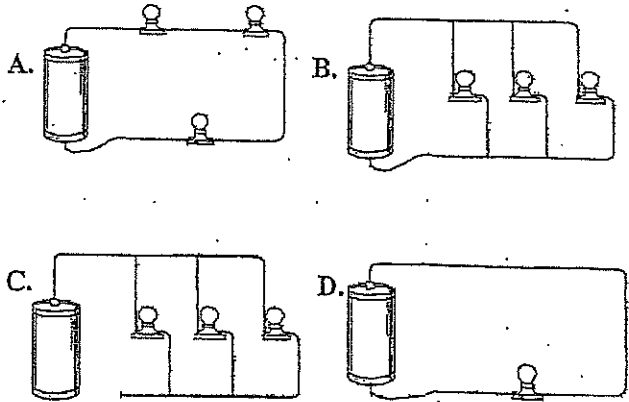
Use the following drawing to answer number 31



31 What kind of circuit is pictured?

- A a combination series circuit
- B there is no complete circuit
- C a parallel circuit only
- D a series circuit only

Refer to the diagram to answer number 32

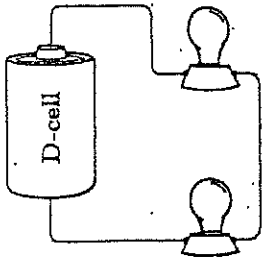


32 Which of the above is a closed series circuit?

- A
- B
- C
- D

# Electricity Practice Test

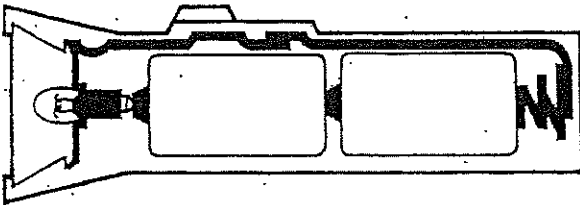
Use the picture to answer number 33



Which of these best describes this circuit?

- A open and series
- B closed and series
- C open and parallel
- D closed and parallel

Use the picture to answer number 34



What type of circuit is usually found in an ordinary flashlight?

- A short
- B series
- C complex
- D parallel

Answer/ Scale	Objective	?	Answer/ Scale	Objective
1 C	4.3b Basic circuits	18	C	4.3a Conductors and insulators
2 B	4.3b Basic circuits	19	C	4.3b Basic circuits
3 D	4.3e Simple electromagnets and magnetism	20	B	4.3c Static electricity
4 C	4.3b Basic circuits	21	C	4.3c Static electricity
5 B	4.3c Static electricity	22	B	4.3d Electrical energy transformed
6 C	4.3a Conductors and insulators	23	B	4.3d Electrical energy transformed
7 A	4.3a Conductors and insulators	24	C	4.3e Simple electromagnets and magnetism
8 B	4.3d Electrical energy transformed	25	A	4.3e Simple electromagnets and magnetism
9 B	4.3a Conductors and insulators	26	A	4.3f Historical contributions in electricity
10 A	4.3e Simple electromagnets and magnetism	27	C	4.3a Conductors and insulators
11 B	4.3b Basic circuits	28	A	4.3a Conductors and insulators
12 A	4.3e Simple electromagnets and magnetism	29	C	4.3c Static electricity
13 C	4.3f Historical contributions in electricity	30	C	4.3b Basic circuits
14 B	4.3f Historical contributions in electricity	31	C	4.3b Basic circuits
15 A	4.3a Conductors and insulators	32	A	4.3b Basic circuits
16 C	4.3a Conductors and insulators	33	B	4.3b Basic circuits
17 B	4.3b Basic circuits	34	B	4.3b Basic circuits

questions on test: 34

Minimum points  
required to achieve  
mastery category

Objectives measured: 6	Items	Points	●	▼	Questions measuring this objective
Basic circuits	11	11	9	7	1 2 4 11 17 19 30 31 32 33 34
Simple electromagnets and magnetism	5	5	4	-	3 10 12 24 25
Static electricity	4	4	3	-	5 20 21 29
Conductors and insulators	8	8	6	-	6 7 9 15 16 18 27 28
Electrical energy transformed	3	3	3	2	8 22 23
Historical contributions in electricity	3	3	3	2	13 14 26
<b>TOTAL</b>		<b>34</b>	<b>28</b>	<b>24</b>	