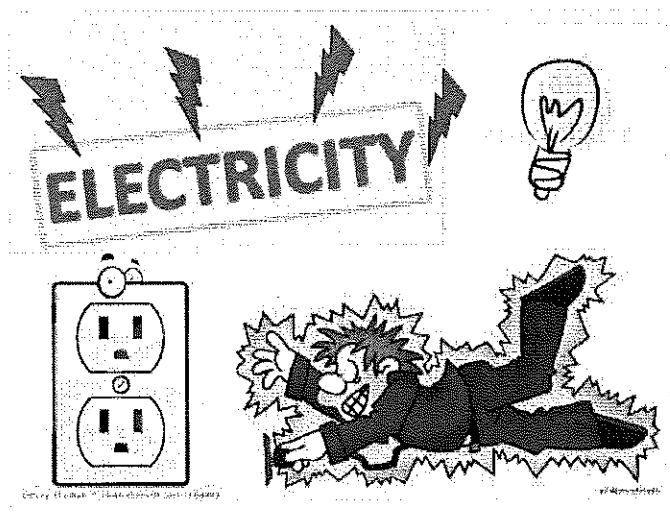


Electricity Unit Introduction

In this unit, students will investigate electrical energy, including static electricity, electromagnetism, and current electricity. Students will understand how electrical energy is transformed and controlled for use in everyday life. These include simple electric circuits, switches, parallel and series circuits, and electromagnets. Students will also focus on renewable and nonrenewable energy resources and their advantages and disadvantages. Finally, students will investigate electrical consumption and identify ways to conserve electrical energy.

Vocabulary: positive charge, negative charge, static electricity, current electricity, battery, dry cell, electrical circuit, insulator, conductor, switch, series circuit, parallel circuit, magnetic field, electromagnet, motor, generator, transformation, electrical energy, renewable, nonrenewable, electrical meter, efficiency label, and energy consumption.



SCIENCE WORD SPLASH

With your group, think up as many words as you can that you associate with electricity.



Electricity

Static Electricity Big Ideas

1. What is static electricity?
2. How is static electricity produced?
3. What are some examples of static electricity in everyday life?
4. How can you reduce or control static electrical charges?

STATIC ELECTRICITY

1. All objects have small particles of positive and negative charges.
2. When two objects rub together, such as hair and a balloon, some of the negative charges from the hair are transferred to the balloon. This gives the balloon a negative charge and the hair a positive charge. The hair and balloon are attracted to each other because one has a positive charge and the other has a negative charge.
3. All matter is made up of atoms. Atoms are made up of smaller particles called electrons, which are negatively charged. These electrons orbit around a positively charged nucleus.
4. Negative charges usually balance the positive charges. The electrons are loosely held in the outer regions of an atom and can be easily transferred to other objects. This creates static electricity.

5. Static means 'not moving'. When the charges stay on objects they are called 'static' charges'. Static electricity means static charges leaping from one object to another.

Objects attract and repel other objects depending on how they are charged:

- negatively and positively charged materials attract each other
- uncharged materials are attracted to charged materials
- materials of like charges repel each other

STATIC ELECTRICITY

1. All _____ have small particles of _____ and _____ charges.
2. When _____ objects rub together, such as hair and a balloon, some of the _____ charges from the hair are _____ to the balloon. This gives the balloon a _____ charge and the hair a _____ charge. The hair and balloon are _____ to each other because one has a positive _____ and the other has a negative _____.
3. All matter is made up of _____. Atoms are made up of smaller particles called _____, which are negatively charged. These electrons _____ around a _____ charged nucleus.
4. Negative charges usually _____ the positive charges. The electrons are _____ held in the outer regions of an atom and can be easily transferred to other objects. This creates _____.
5. Static means '_____. When the charges stay on objects they are called '_____ charges'. Static electricity means _____ charges _____ from one object to another.

Objects _____ and _____ other objects depending on how they are charged:

- negatively and positively charged materials _____ each other
- _____ materials are _____ to _____ materials
- materials of _____ charges _____ each other



STATIC ELECTRICITY



STATIC ELECTRIC CHARGES

Procedure

- 1) Inflate a balloon and tie it closed.
- 2) Make predictions about the following:

*What do you think will happen if you rub the balloon on your hair?

*What will happen to the balloon?

*What will happen to your hair if you place the balloon close to your head?

- 3) Test your predictions by rubbing the balloon on your hair, then slowly move the balloon a few centimeters away from your head.
- 4) Record your observations.

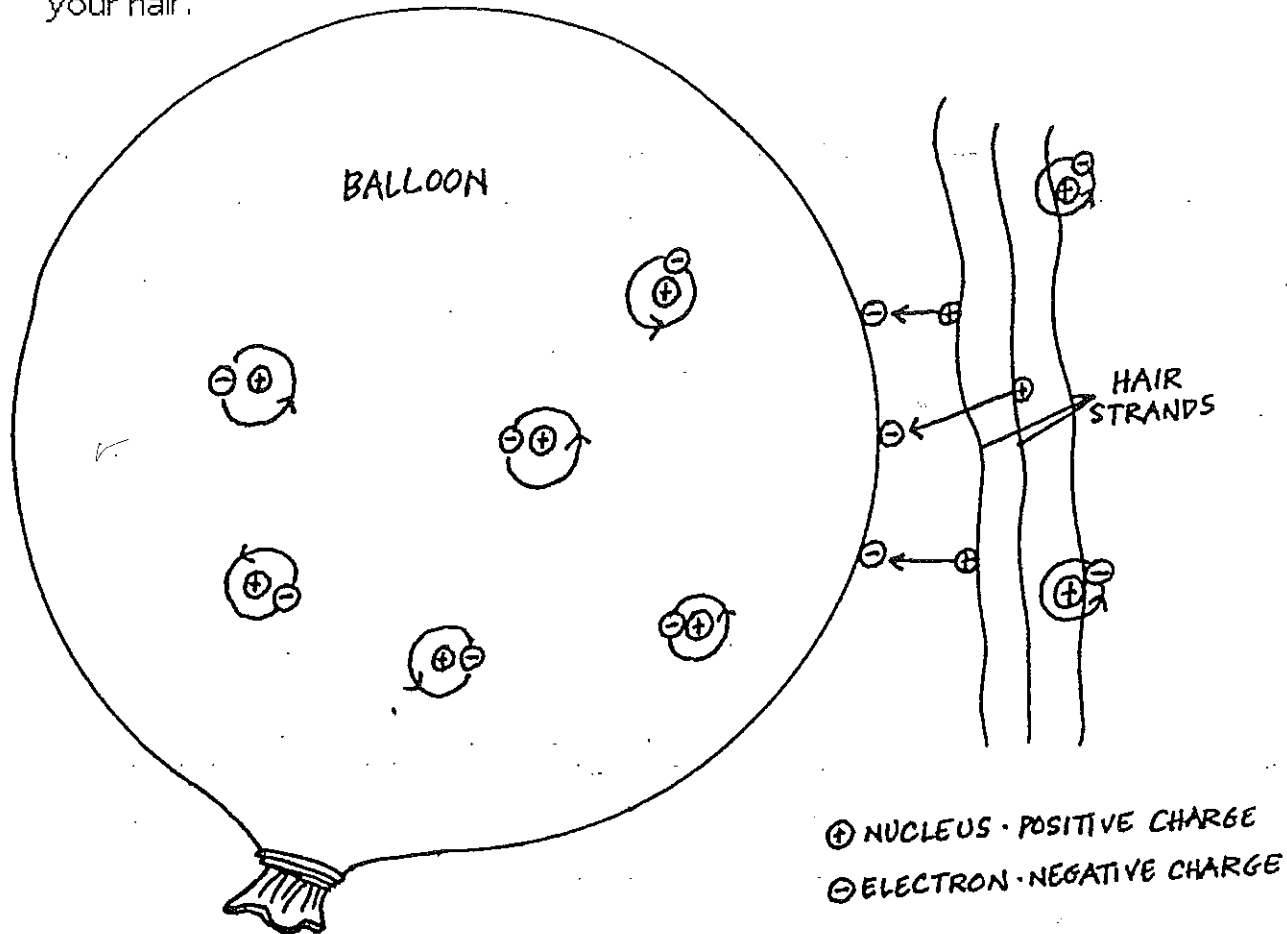
- 5) Why do you think your hair was attracted to the balloon?





The activity you recently completed was an example of static electricity.

The diagram below demonstrates what happens when a balloon is rubbed on your hair.



All objects have small particles of _____ and _____ charges.

When two objects rub together, such as hair and a balloon, some of the negative charges from the hair are transferred to the balloon. This gives the balloon a _____ charge, and the hair a _____ charge. The hair and the balloon are _____ to each other because one has a positive charge and the other has a negative charge. This is similar to how opposite poles on a _____ attract to each other.

Date: _____ Name: _____

Static Electricity

Part One

1. Pour some salt and pepper onto a sheet of paper.
2. Bring the uncharged balloon close to the salt and pepper. What do you observe? _____

3. Now charge the balloon by rubbing it against your hair or clothing. Bring the balloon close to the salt and pepper again. What do you observe? _____

4. Did both the salt and pepper react the same way? _____

5. Wipe the balloon with a damp cloth. What does this do to the balloon? _____

6. Tear the tissue paper into dime-size pieces. Put the tissue pieces on a sheet of paper.
7. Charge the balloon again. What do you think will happen if you bring the balloon near the pieces of tissue paper? _____

8. Test your prediction by bringing the charged balloon close to the pieces of tissue paper. What do you observe? _____

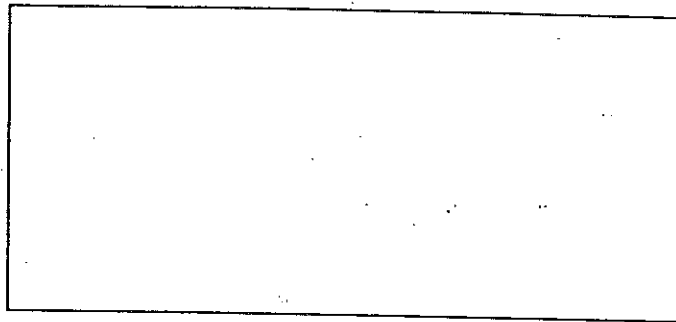
9. Why were the pieces of tissue paper attracted to the balloon? _____

10. What other objects do you think might be attracted to a charged balloon? Test a few objects. Record your results.

Part Two

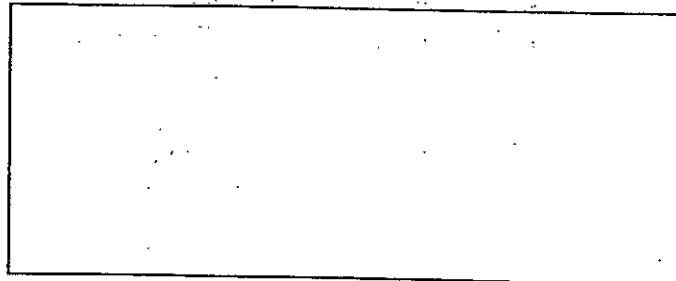
1. Blow up two balloons and tie them shut.
2. Tie a long piece of thread to the end of each balloon.
3. Charge one of the balloons by rubbing it on your hair or clothing. What do you think will happen if the two balloons are brought close together? _____

4. Test your predictions by bringing the two balloons close together. Record your observations and draw a labelled diagram of what happened.



5. Wipe both balloons with a damp cloth.
6. Now charge both balloons. What do you think will happen if you bring the two charged balloons close together? _____

7. Test your predictions by bringing the two balloons close together. Record your observations and draw a labelled diagram of what happened.



8. What have you learned about static electric charges? _____

