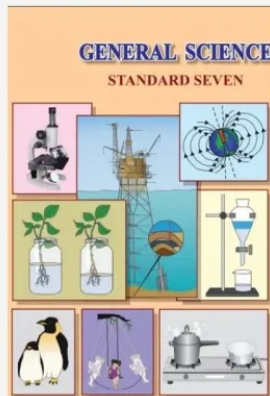


Maharashtra Board Solutions Class

7-Science: Chapter 8- Static Electricity

BOOK SOLUTIONS
CLASS 8
GENERAL SCIENCE

CHAPTER 8
Static Electricity



Maharashtra Board Solutions→

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7-Science: Chapter 8- Static Electricity

Class 7: Science Chapter 8 solutions. Complete Class 7 Science Chapter 8 Notes.

Maharashtra Board Solutions Class 7-Science: Chapter 8- Static Electricity

Maharashtra Board 7th Science Chapter 8, Class 7 Science Chapter 8 solutions

Questions and Answers

1. Choose the correct option and fill in the blanks.

(always repulsion, always attraction, displacement of negative charge, displacement of positive charge, atom, molecule, steel, copper, plastic, inflated balloon, charged object, gold)

Question a.

There is between like charges.

Answer:

always repulsion

Question b.

..... is responsible for generation of electric charge in an object.

Answer:

displacement of negative charge

Question c.

A lightning conductor is made of a strip.

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Answer:

copper

Question d.

..... does not get electrically charged easily by rubbing.

Answer:

Steel

Question e.

There is when opposite electric charges come near each other.

Answer:

always attraction

Question f.

A can be detected with an electroscope.

Answer:

charged object

2. Explain why it is not safe to go out with an umbrella when there is heavy rain, lightning or thunder.

Question a.

Explain why it is not safe to go out with an umbrella when there is heavy rain, lightning or thunder.

Answer:

Large amount of charges get built up in the clouds in rainy and stormy weather.

1. Sometimes these charges are transferred to the earth in the form of a bolt of lightning.
2. Wire of umbrella is made up of metal and cloth is made up of synthetic material.
3. If lightning strikes, then umbrella catches it and there are chances of fire and it would be dangerous.

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4. So it is not safe to go out with an umbrella when there is heavy rain.

3. Answer in your own words.

Question a.

How will you protect yourself from lightning?

Answer:

1. To protect from the lightning, we have to put lightning conductor on high rise buildings,
2. we should not stand under a tree in rainy and stormy weather.
3. We should not go out with an umbrella in heavy rain, lightning or thunder.

Question b.

How are charges generated?

Answer:

1. Friction causes a charge to develop, because on rubbing, some negative particles are transferred from one substance to the other and the later develops a negative charge.
2. The substance from which particles are removed lose negative charge and hence, it develops a positive charge.

Question c.

In the lightning conductor, what provision is made for spreading the electricity into the ground?

Answer:

1. The lightning conductor, consists of a long i copper strip with one end forked. This end is ' at the highest part of the building.
2. The other end of the strip is connected to a plate of cast iron.
3. A pit is dug in the ground, coal and salt are filled into the pit and the iron plate is placed upright in the pit.
4. There is also a provision for pouring water into it.
5. This helps to spread the electric charge quickly into the ground.

Question d.

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Why do farmers stick an iron staff into the ground while working in the field in rainy conditions?

Answer:

1. Large amount of charges get built up in the clouds in rainy and stormy weather.
2. Sometimes these charges are transferred to the earth in the form of a bolt of lightning.
3. Due to iron staff, the charges will be conducted to the earth through iron metal and spread quickly into the ground.
4. This way farmers are saved from lightning strike.

Question e.

Why is lightning not seen every day during the rainy season?

Answer:

1. When air and clouds rub against each other in the sky the upper part of some clouds becomes positively charged and the lower side become negatively charged.
2. When this negative charge at the bottom of the cloud becomes much larger than the charge on the ground, it starts flowing towards the ground in stages, but this doesn't happen every day. So lightning is not seen every day during the rainy season.

4. What are the characteristics of a static electric charge?

Question a.

What are the characteristics of a static electric charge?

Answer:

Following are the characteristics of a static electric charge.

1. The electric charge generated by friction is called frictional electricity. This charge is produced only at the place of friction, hence it is called static electricity.
2. It remains on the object for a short duration.
3. The charges of static electricity are absorbed in moist air.
4. An electrically charged object attracts another object which has no electric charge.
5. Like charges repel each other.
6. Unlike charges attract each other.
7. Repulsion is the sure test of the existence of a static charge.

5. What is the damage caused by lightning? How will you create awareness to prevent it?

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Question a.

What is the damage caused by lightning? How will you create awareness to prevent it?

Answer:

Due to lightning great damage can occur.

1. It may cause fire.
2. Person on whom lightning strikes may die also.
3. It causes more temperature than sun.

Awareness to prevent it:

1. Guide the people to install lightning conductor on tall buildings.
2. Do not stand on open ground, below a tree, or on a high location during the thunder storms.
3. Do not use plugged in electrical appliances.
4. Do not stand near an electric pole, telephone pole or a tower.
5. Stay in pucca house made of brick and cement.
6. Stand on only wood, a plastic sheet or sack of jute.

Project:

Question a.

Make an electroscope yourself by using a thin aluminium foil and check which substances become electrically charged.

Important Questions and Answers**1. Choose the correct option and fill in the blanks.**

(always repulsion, always attraction, displacement of negative charge, displacement of positive charge, atom, molecule, steel, copper, plastic, inflated balloon, charged object, gold)

Question 1.

named the electric charges as positive charge and negative charge.

Answer:

Benjamin Franklin

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Question 2.

Each atom contains a stationary charge and moving charges.

Answer:

positive, negative

Question 3.

Each atom is electrically

Answer:

neutral

Question 4.

Amber is called in the Greek language.

Answer:

electron

Question 5.

The charges of electricity are absorbed in moist air.

Answer:

static

Question 6.

Electrically charged objects uncharged objects.

Answer:

attract

Question 7.

is used as a test for identifying an electrically charged object.

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Answer:

Repulsion

Question 8.

The property of amber to attract things was named electricity by in 1646 AD.

Answer:

Thomas Brown

Question 9.

The electric charge generated by stays only as long as the charged object is near to it.

Answer:

induction

Question 10.

A simple device is used to detect the electric charge on an object.

Answer:

gold leaf electroscope

Question 11.

Lightning is a form of

Answer:

electric charge

Question 12.

The gas protects us from the harmful ultra violet rays coming from the sun.

Answer:

ozone

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Question 13.

The is a device used for protection from a lightning strike.

Answer:

lightning conductor

Question 14.

Due to the energy of the lightning, the oxygen in the air is converted into

Answer:

ozone

2. Match the columns:**Question a.**

Column 'A'	Column 'B'
1. Like charges	a. gold leaf electroscope
2. Unlike charges	b. lightning conductor
3. Copper strip	c. attraction
4. Gold leaves.	d. repulsion

Answer:

Column 'A'	Column 'B'
1. Like charges	d. repulsion
2. Unlike	c. attraction

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charges

3. Copper strip b. lightning conductor

4. Gold leaves. a. gold leaf
electroscope

Say whether true or false, correct and rewrite the false statement:

Question 1.

Charges cannot be transferred from one body to another.

Answer:

False. Charges can be transferred from one body to another

Question 2.

The word 'electricity.' came from the word 'Elektron'.

Answer:

True

Question 3.

When an inflated balloon is rubbed on silk, it develops a charge.

Answer:

True

Question 4.

An ebonite rod rubbed on woollen cloth develops a positive charge.

Answer:

False. An ebonite rod rubbed on woollen cloth develops a negative charge

Question 5.

A glass rod rubbed on woollen cloth develops a negative charge.

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Answer:

False. A glass rod rubbed on woollen cloth develops a positive charge

Question 6.

If the leaves of the electroscope spread only a little, the charge on them is less.

Answer:

True

Question 7.

An atom may have either a positive or a negative charge.

Answer:

False. An atom does not have any charge

Question 8.

When two substances are rubbed on each other, like charges are developed on each.

Answer:

False. When two substances are rubbed on each other unlike charges are developed on each

Question 9.

High rise buildings have lightning conductors.

Answer:

True

Question 10.

It is dangerous to stand under a tree in rainy and stormy weather.

Answer:

True

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Give scientific reasons:

Question 1.

Ordinarily, an atom does not have any charge.

Answer:

1. Every atom contains smaller particles with either positive or negative charge.
2. As the number of positively and negatively charged particles in an atom is equal, they neutralize each other.
3. As a result the atom has no charge.

Question 2.

Charge cannot be developed on a copper rod.

Answer:

Charge cannot be developed on a copper rod because only certain pairs of substances give rise to electric charge, on rubbing.

Question 3.

High rise buildings have lightning conductors.

Answer:

1. High rise buildings are prone to lightning strikes during the monsoon.
2. When lightning strikes, a tremendous electric charge is transferred to the earth, which may damage the tall buildings.
3. To prevent this, high rise buildings have a forked metal rod, called a lightning conductor fitted on the top of the building.
4. The lower end of this rod is buried inside the earth.
5. If lightning strikes, the electric charge passes through this conductor and goes in to the earth. In this way the building is saved from damage.

Question 4.

It is dangerous to stand under a tree in rainy and stormy weather.

Answer:

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1. Large amount of charges get built up in the clouds in rainy and storming weather.
2. Sometimes these charges are transferred to the earth in the form of a bolt of lightning.
3. Generally lightning strikes tall buildings and trees. If lightning strikes a tree then either the tree may fall or it may catch fire.
4. In both cases this would be dangerous for anyone standing under the tree, hence it is dangerous to stand under a tree in rainy and stormy weather.

Question 5.

Repulsion is a test used for identifying an electrically charged object.

Answer:

1. When a charged object is brought near a neutral object, it gets attracted when two oppositely charged objects are brought close, they get attracted. Therefore, attraction is not a test.
2. But when two like charges are brought close only then repulsion takes place.
3. Therefore, repulsion is the sure test for identifying an electrically charged object.

Question 6.

Mustard seeds when shaken vigorously in a glass bottle stick to the sides of the bottle.

Answer:

When seeds are shaken they get electrically charged and therefore they stick to the neutral walls of the glass.

Answer the following:

Question 1.

Why is the charge developed due to friction called static electric charge?

Answer:

The charge developed due to friction is called static electric charge because the charge remains still on the object.

Question 2.

Why does the charge developed by induction disappear quickly?

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Answer:

The charge developed by induction disappears quickly because it is very weak.

Question 3.

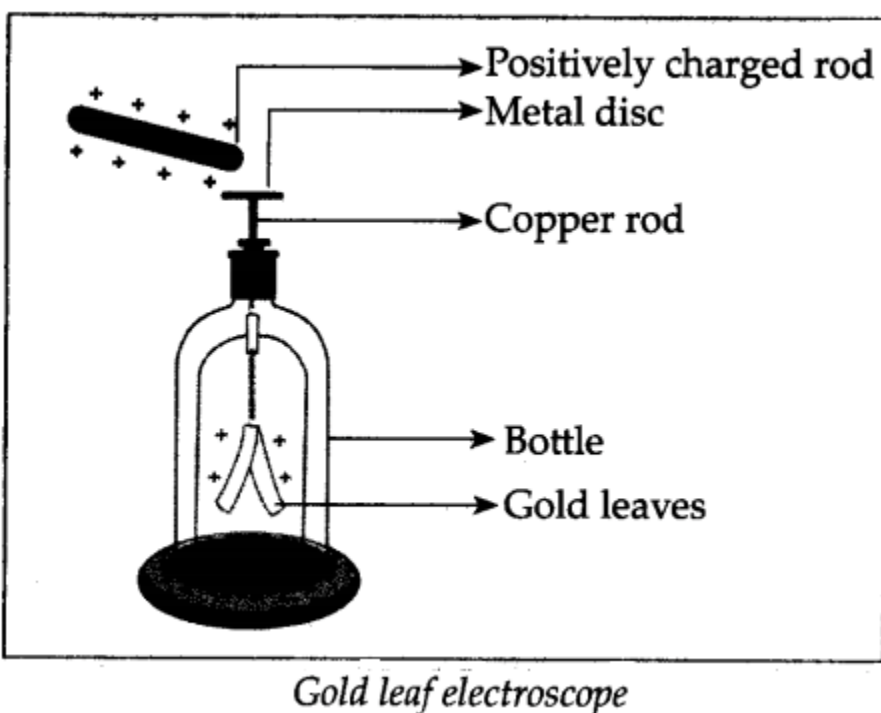
Why do the leaves of a gold leaf electroscope fly apart when a charged body touches its disc?

Answer:

The leaves of a gold leaf electroscope fly apart when a charged body touches its disc because like charges develop on both the leaves and hence they repel each other.

Draw a neat labelled diagram of Gold leaf electroscope and describe it.

Answer:



1. This is a simple device to detect the electric charge on object.
2. It consists of a copper rod which has a metal disc at the upper end and two thin gold leaves at the other.
3. The rod is placed in a bottle so that the disc is above the bottle.

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4. When an uncharged object is taken near the disc, the leaves remain closed.
5. When a charged object is taken near the disc, both the leaves are charged by the same electric charge, and repel each other.
6. When we touch the disc with our hand, the leaves collapse because the charge in the leaves goes into the earth through our body, and the leaves get discharged.

Use your brainpower:

Question 1.

Do all the objects get charged by rubbing?

Answer:

No. Only certain pairs of substances get charged on rubbing.

Question 2.

Why does a charged balloon stick to a wall?

Answer:

A charged balloon stick to a wall because there is always attraction between a charged object and an uncharged object.

Question 3.

Can we use leaves of some other metal instead of gold, in the electroscope? Which properties must that metal have?

Answer:

We can use other metals than gold in gold leaf electroscope.

1. Only thing is that metal should be malleable and good conductor of electricity.
2. But the best is gold only because we can make extremely thin leaves of gold so even very small charge also can be detected.

Question 4.

What kind of damage is caused by a lightning strike?

Answer:

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Due to lightning strike, great damage can occur. It may cause forest fire and burn down things. Person on whom lightning strikes may die. It causes more temperature than sun.

Question 5.

What measures will you take to prevent the damage caused by lightning?

Answer:

Following measures can be taken to prevent the damage caused by lightning:

1. Always put lightning conductor on tall buildings.
2. Do not stand on open ground, below a tree or near the electric or telephone pole during rain/ thunder storms.
3. Do not lean on wired fences.
4. Do not use plugged in electrical appliances.
5. Do not swim during thunder storms.
6. Stay in a pucca house with lightning conductor fitted on it.

Question 6.

Why is the upper end of the lightning conductor pointed?

Answer:

1. The pointed end makes it possible to increase the electric field near the point. The electric field set up at pointed end is high.
2. If the discharge of cloud occurs it would be easily passed through the lightning conductor to the ground and damage to the building is averted.

Question 7.

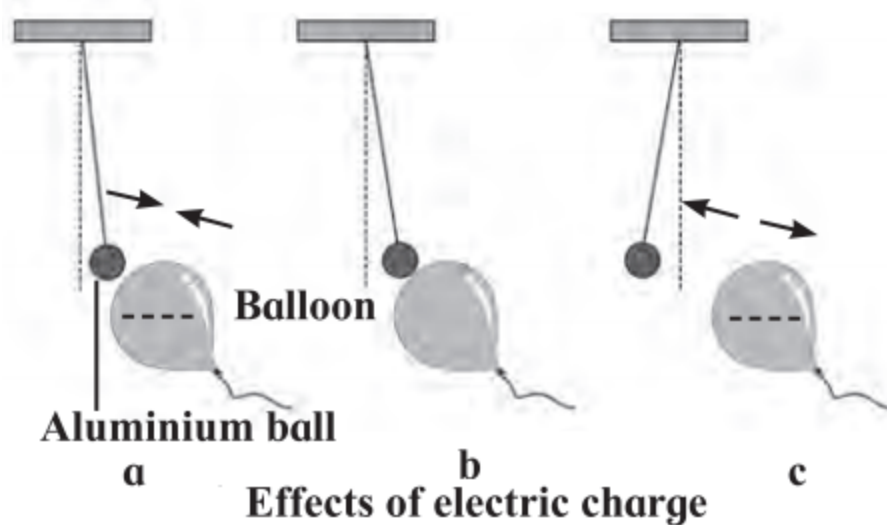
Why is coal and salt added to the pit in the ground?

Answer:

Coal and salt is filled in the pit and also there is a provision for pouring water into it. This helps to spread electric charge quickly into ground and prevent damage.

Observe the given diagram and answer the questions given.

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Question a.

Name the phenomenon happening in the diagram and define it

Answer:

Phenomenon happening is static electricity.

When certain objects are rubbed against each other, they produce an electric charge on their surface at the place of friction. This is due to electrons which remain for a short time. This is called static electricity.

Question b.

What do you observe in “b” and “c” part of the diagram?

Answer:

In ‘b’, we observe attraction between the charged balloon and the uncharged aluminium ball. In ‘c’, we observe that the charge has been transferred to the aluminium ball and due to the same (like) charge, repulsion is observed.

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- Chapter 8- Static Electricity
- Chapter 9- Heat
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