# Chapter 11. Some Natural Phenomena

## Very Short Q&A:

**Q1: Name some destructive natural phenomena.**

**Ans:** Earthquake, lightning, cyclones etc.

**Q2: _____ is caused by the accumulation of charges in the cloud.**

**Ans:** Lightning

**Q3: Name the scientist who showed for the first time that lightening and spark from our clothes are essentially the same phenomena.**

**Ans:** Benjamin Franklin.

**Q4: Scientific _____ are the result of handwork by many people**

**Ans:** Discoveries

**Q5: A charged balloon _____ another charged balloon.**

**Ans:** Repels

**Q6: A charged balloon _____ a charged refill.**

**Ans:** Attracts

**Q7: Charges of same kind attract each other. True/False.**

**Ans:** True.

**Q8: Charges of different kind attract each other. True/False.**

**Ans:** False.

**Q9: What kind of electric charge is generated by rubbing of two different objects?**

**Ans:** Static charge.

**Q10: What is an electroscope?**

**Ans:** Electroscope is a device used to detect whether a body is charged or not.

**Q11: What kind of conductor is used to transfer electrical charge from a charged object to another?**

**Ans:** Metal conductor

**Q12: Define earthing.**

**Ans:** The process of transfer of charge from a charged object to earth is called earthing.

**Q13: What is the main purpose of providing earthing in buildings?**

**Ans:** To protect us from electrical shocks due to any leakage of electrical current.

**Q14: During lightning and thunderstorm open place is safe or not?**

**Ans:** No

**Q15: Rena is in a forest, suddenly thunderstorm came, what she should do now?**

**Ans:** She should take shelter under shorter tree in the forest.

**Q16: Neha is in an open field, suddenly thunderstorm came, what she should do now?**

**Ans:** She should stay far away from all trees in the forest and also from poles or other metal objects.

**Q17: During a thunderstorm Raj has to make an urgent call, what according to you he should use landline phone with cords or cordless phone?**

**Ans:** Cordless phone

**Q18: Bathing should be avoided during thunderstorm to avoid contact with _____.**

**Ans:** running water.

**Q19: Name the device used to protect buildings from the effects of lightning.**

**Ans:** lightning conductors

**Q20: What do you mean by earthquake?**

**Ans:** An earthquake is the result of a sudden release of energy in the earth's crust that creates seismic waves.

**Q21: Name the place where major earthquake occurred in 2005 in India.**

**Ans:** Uri and Tangdhar towns of North Kashmir.

**Q22: Name the place where major earthquake occurred in 2001 in India.**

**Ans:** Bhuj district of Gujarat.

**Q23: Earthquakes can cause floods and _____.**

**Ans:** landslides

**Q24: A major Tsunami occurred in the Indian Ocean on _____.**

**Ans:** 26 December, 2004

**Q25: Outermost layer of earth is called**

a. **Menarche**
b. **Menopause**
c. **Menstruation**
d. **All of the above**

**Ans:** Crust

**Q26: Innermost layer of earth is called _____.**

**Ans:** Inner core.

**Q27: Define plate.**

**Ans:** The outer most layer of earth is not in one piece, it is fragmented and each fragment is called a plate.

**Q28: Most of the earthquakes are caused by the movement of earth's_____.**

**Ans:** Plate

**Q29: Name some places in India where earthquakes are more likely to occur.**

**Ans:** Kashmir, western and central Himalayas, the whole of north- east, Rajasthan, Rann of Kuch and Indo- Gangetic plane.

**Q30: What is the magnitude of highly destructive earthquakes on a Richter scale?**

**Ans:** higher than 7

**Q31: What was the magnitude of Bhuj and Kashmir earthquake on the Richter scale?**

**Ans:** higher than 7.5

**Q32: What are the causes of tremors on the earth?**

**Ans:** Because of volcanic eruptions, or because of a meteor hitting the earth or an underground nuclear explosion.

**Q33: Name the wave produced by tremors?**

**Ans:** Seismic waves

**Q34: Name the instrument used record the wave produced by tremors.**

**Ans:** Seismograph

**Q35: In highly seismic areas, roofs should be kept _____.**

**Ans:** Very light.

**Q36: Which of the following cannot be charged easily by friction?**

a. **A copper rod**
b. **A plastic scale**
c. **A woollen cloth**
d. **An inflated balloon**

**Ans:** A copper rod

**Q37: What kind of electric charge is acquired by a glass rod rubbed with silk cloth?**

**Ans:** Positive charge

**Q38: What kind of electric charge is acquired by a plastic comb rubbed with dry hair?**

**Ans:** Negative charge

**Q39: A negatively charged object attracts another charged object kept close to it. Name the nature of charge on the other object?**

**Ans:** Positive charge

**Q40: A negatively charged object repels another charged object kept close to it. Name the nature of charge on the other object?**

**Ans:** Negative charge

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## Short Q&A:

**Q1: Why does a plastic comb rubbed with dry hair attract tiny pieces of paper?**

**Ans:** Plastic comb gets electrically charged due to rubbing & therefore it attracts tiny pieces of paper which are neutral, as charged body can attracts an uncharged body.

**Q2: Why a copper rod cannot be charged by friction, if held by hand?**

**Ans:** Copper is a conducting object, as soon as it gets charged by rubbing with another material, the electric charge produced on its surface flow through our hand & body into the earth and it remains uncharged.

**Q3: Mention three ways by which a body can be charged.**

**Ans:** Three ways are:

a. Charging by rubbing: Charging of an object by rubbing it with another object is called charging by rubbing.The body which loses electrons acquires positive charge whereas the body which gains electrons acquires negative charge.
b. Charging by conduction: Charging a neutral body by bringing it in contact with a charged body is called charging by conduction.
c. Charging by induction: Charging a neutral body by bringing it near a charged body is called charging by induction

**Q4: What do you mean by earthing? What is the purpose of providing it in buildings?**

**Ans:** The process of transferring of charge from a charged object to the earth is called earthing. For our safety, most of the electrical appliances and the mains of the house are connected to earth, so that we can be prevented from getting an electric shock.

**Q5: Suppose you are outside your home and an earthquake strikes. What precaution would you take to protect yourself?**

**Ans:** The following precautions should be taken are as follow:

a. Find a clear spot, away from buildings, trees, poles and electric poles, signboards and overhead power lines and drop to the ground
b. Do not use elevators if they are available at some place outside your house.
c. If you are in a car or a bus, do not come out and drive slowly to a clear spot.

**Q6: Suppose you are at home and an earthquake strikes. What precaution would you take to protect yourself?**

**Ans:** The precautions that should be taken are as follow:

a. Take shelter under a table and stay there only, till the shaking stops
b. Stay away from the objects which are tall and heavy that may fall on you.
c. If you are on bed, do not get up and remain there only andprotect your head with pillow.

**Q7: Explain earthing.**

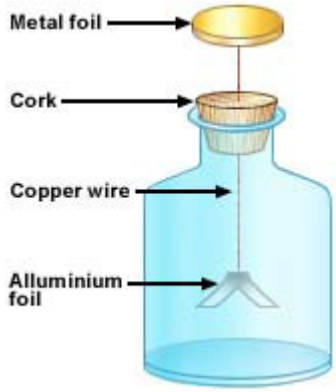
**Ans:** The process of transferring of charge from a charged object to the earth is called earthing. For our safety, most of the electrical appliances and the mains of the house are connected to earth, so that we can be prevented from getting an electric shock.

**Q8: What do you mean by lightning conductor?**

**Ans:** Lightning conductor is a device used to protect buildings from the damaging effects of lightning. It runs from the top to the bottom, along the outer wall of the buildings or any other object, which is to be protected. If lightning strikes the buildings or any other objects, then the lightning conductor provides an easy and direct path for the lightning bolt to pass to the ground without effecting them.

**Q9: Draw the diagram of an instrument, which can be used to detect the charge on a body.**

**Ans:**




**Q10: How an electroscope can be charged through conduction?**

**Ans:** An electroscope is used to detect the charge on a body. A plastic comb is taken and it is rubbed on hair. Now, the plastic comb gets charged. The comb is touched with the electroscope plate. The static charges which are developed on the comb travels down the conducting wire and reach the two leaves of aluminium foil. Similar charges are acquired by both the leaves and as a result, they repel each other. Thus, the method of charging an uncharged body by bringing another charged body directly in contact is called charging by conduction. By this way, an electroscope can be charged through conduction.

**Q11: A crackling sound is heard while taking off sweater during winters. Explain the reason behind this.**

**Ans:** As we know that electrical charges that are generated through friction are static, i.e they do not move by themselves and Motion of charges constitutes an electric current. When we take off our sweater there is a motion between the charges on the sweater and our body that produces electric current, which produces a crackling sound. Infact we can see a spark if we take off the sweater in the dark.

**Q12: What are tectonic plates?**

**Ans:** The earth's lithosphere is fragmented into many pieces. Each fragment is called a plate, also called tectonic plate. These plates are in continuous motion i.e. they float over hot magma.

**Q13: Explain seismograph.**

**Ans:** Tremors or vibrations caused by the earthquakes which travel in the form of waves within the earth or along the earth's surface, are called seismic waves. Seismograph is an instrument which records these seismic waves.

**Q14: Touch the disc of an electroscope with an ebonite rod rubbed with fur. Now bring a glass rod rubbed with silk close to the disc of this electroscope. Explain what do you observe?**

**Ans:** After rubbing, ebonite rod acquires negative charge. Now when it is touched with the metal cap of an electroscope then both the metal cap & the leaves acquire negative charge due to conduction. Because of negative charge on both the leaves, divergence of leaves takes place. After rubbing with silk, glass rod acquire positive charge & when this positive rod is brought near the metal cap of the above negatively charged electroscope then due to induction positive charge gets induced in the leaves as a result collapsing of leaves takes place.

**Q15: What happens when we touch the metal cap of a charged electroscope with our finger? What is the name of this process?**

**Ans:** The leaves of an electroscope collapse as soon as we touch the metal cap with hand because the leaves of the charged electroscope lose charge to the earth through our body in other words leaves are discharged. This process is known as Earthing.

**Q16: What is the nature of charge on the metal cap and on the leaves of the uncharged electroscopewhen a negatively charged body is brought in contact with its metal cap?**

**Ans:** Nature of charge on the metal cap and on the leaves of the uncharged electroscope is negative.

**Q17: How would you use an electroscope to determine the nature of charge of a charged body?**

**Ans:** Let the electroscope get charged with negative charge, by touching a negatively charged ebonite rod to the metal disc of the electroscope. The leaves of the electroscope open up (diverge).Now touch the body to be tested with the metal disc of the charged electroscope.

- If the divergence of the leaves increases, the body has similar charge that is the given body is also negatively charged.
- If the divergence of the leaves decreases, the body has unlike charge that is the given body is positively charged.

**Q18: What are the uses of an electroscope?**

**Ans:** An electroscope can be used for following purposes:

a. To detect & measure the charge on a body.
b. To determine the nature of charge on a body.

**Q19: List two states in India where earthquakes are more likely to strike.**

**Ans:** Two places in India which are most threatened by earthquake are Kashmir and Rann of kutch.

**Q20: Explain why a charged balloon is repelled by another charged balloon but a charged balloon is attracted by a charged balloon?**

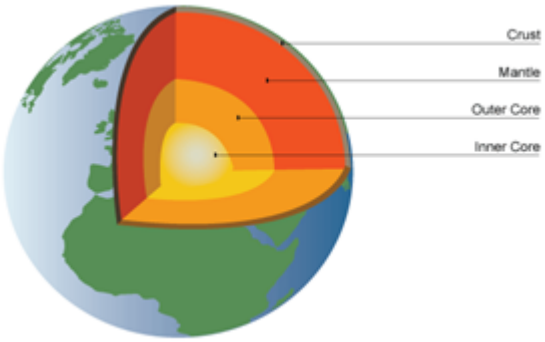
**Ans:** The charged balloon has similar charges on its surfaces, since like charges repel each other thus charged balloon repels another charged balloon. When an uncharged balloon is brought near a charged balloon it acquires some opposite charge, since opposite charge attracts each other therefore a charged balloon attracts an uncharged balloon.

**Q21: Why a charged body loses its charge if we touch it with our hand?**

**Ans:** A charged body loses its charge if we touch it with our hand because the charges get transferred from our body to earth, this process is known as earthing.

**Q22: Draw a labelled diagram of the structure of earth.**

**Ans:**




**Q23: What causes an earthquake?**

**Ans:** The earth's lithosphere is fragmented into many pieces. Each fragment is called a plate, also called tectonic plate, these plates are in continual motion, when they brush past one another a plate goes under another because of collision, and they cause disturbance in earth’s crust, this disturbance shows up as an earthquake on the surface of earth.

**Q24: What are the protections to be taken against earthquakes?**

**Ans:** If you are at home:

- Take shelter under the table and stay there until the stoppage of shaking
- Keep yourself away from the tall or heavy objects that may fall on you and damage you.
- If you are on bed, do not get up and keep a pillow on your head

If you are outside the home:

- Find a clear spot, away from buildings, trees, poles and electric poles, signboards and overhead power lines and drop to the ground.
- Do not use elevators if they are available at some place outside your house
- If you are in a car or a bus, do not come out and drive slowly to a clear spot.

**Q25: What are the protections to be taken against lightning?**

**Ans:** During lightning avoid going at an open place, try to rush towards safe place like in a house or building, if you are travelling in nay vehicle like car or bus, you are safe inside with windows and doors of the vehicle closed. If you are in a forest take shelter under a smaller tree.

**Q26: Explain a lightening conductor and its function.**

**Ans:** Lightning conductor is the device that protects a tall building from lightning strike, by providing an easier path for current to flow to earth than through the building. It consists of a thick copper strip of very low resistance connected to the ground below. A good connection to the ground is essential and is made

by burying a large metal plate deep in the damp earth. In the event of a direct lightning strike, the current in the conductor may be great as to melt or even vaporize the metal, but the damage to the building will nevertheless be limited.

**Q27: List the things that you should do while thunderstorm.**

**Ans:** During lightning avoid going at an open place, try to rush towards safe place like in a house or building, if you are travelling in nay vehicle like car or bus, you are safe inside with windows and doors of the vehicle closed. If you are in a forest take shelter under a smaller tree.

**Q28: List the things that you should not do while thunderstorm.**

**Ans:** During lightning avoid going at an open place, try to rush towards safe place like in a house or building, if you are travelling in nay vehicle like car or bus, you are safe inside with windows and doors of the vehicle closed. If you are in a forest take shelter under a smaller tree.

**Q29: Define the following**

a. **Lightning**
b. **Earthing**

**Ans:**

a. Lightning: Lightning is a natural phenomenon that has fascinated people for ages. Several people thought and researched about the cause of lightning and its process. Benjamin Franklin discovered for the first time that there is an electric discharge between clouds that produces a spark, and it is the electric spark between the clouds and the earth that appears as lightning. His famous kite experiment proved this fact. The occurrence of lightning is as follows. The formation of clouds involves friction between water particles in the atmosphere. The friction charges the particles. Among the positive and negative charges, the negative charge accumulates at the bottom of the cloud and the positive charges in its top. As the accumulation of the charge increases, the cloud will create a positive charge on the ground nearby. As the amount of charge increases, the negative charge on the cloud tends to make a path towards the ground, and it results in a narrow streak of electrical discharge, which we call lightning.
b. Earthing: The process of transferring of charge from a charged object to the earth is called as earthing. For our safety, most of the electrical appliances and the mains of the house are connected to earth, so that we can be prevented from getting an electric shock.

**Q30: Define the following:**

a. **Richter scale**
b. **Seismograph**

**Ans:**

a. Richter scale: The Richter scale is used to rate the magnitude of an earthquake that is the amount of energy it released. This is calculated using information gathered by a seismograph.
b. Seismograph: Tremors or vibrations caused by the earthquakes which travel in the form of waves within the earth or along the earth's surface, are called seismic waves. Seismograph is an instrument which records these waves.

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## Long Q&A:

**Q1: Explain an electroscope and earthing.**

**Ans:** An electroscope is a device that detects the type of charge on a body. Like charges repel and unlike charges attract each other. This is used in an electroscope. An electroscope consists of a glass jar fitted with a cork lid and a metallic wire passing through it. There are two metallic strips at the bottom of the wire. The upper end of the wire is connected to a metal disc. A body that is positively charged is touched to the metal disc, so that the charge is transferred to the metal strips through the wire, and they diverge from each other on gaining a like charge. Now, if a negatively charged object is brought into contact with the disc, the strips converge towards each other, indicating the unlike charge on the body. Similarly, if a positively charged body is brought in contact with the metal disc, the divergence of the metal strips increases, indicating the like charge on the body. If the metal disc of the electroscope is touched with the hand, it loses its charge to the ground by transfer of charge through the human body. This is called earthing.

**Q2: Explain two natural destructive phenomena.**

**Ans:** Lightning is a natural phenomenon that has fascinated people for ages. Several people thought and researched about the cause of lightning and its process. Benjamin Franklin discovered for the first time that there is an electric discharge between clouds that produces a spark, and it is the electric spark between the clouds and the earth that appears as lightning. His famous kite experiment proved this fact. The occurrence of lightning is as follows. The formation of clouds involves friction between water particles in the atmosphere. The friction charges the particles. Among the positive and negative charges, the negative charge accumulates at the bottom of the cloud and the positive charges in its top. As the accumulation of the charge increases, the cloud will create a positive charge on the ground nearby. As the amount of charge increases, the negative charge on the cloud tends to make a path towards the ground, and it results in a narrow streak of electrical discharge, which we call lightning.

The earth's lithosphere is fragmented into many pieces. Each fragment is called a plate, also called tectonic plate, these plates are in continual motion, when they brush past one another a plate goes under another because of collision, and they cause disturbance in earth’s crust, this disturbance shows up as an earthquake on the surface of earth. The Richter scale is used to rate the magnitude of an earthquake that is the amount of energy it released. This is calculated using information gathered by a seismograph. Tremors or vibrations caused by the earthquakes which travel in the form of waves within the earth or along the earth's surface, are called seismic waves. Seismograph is an instrument which records these waves.