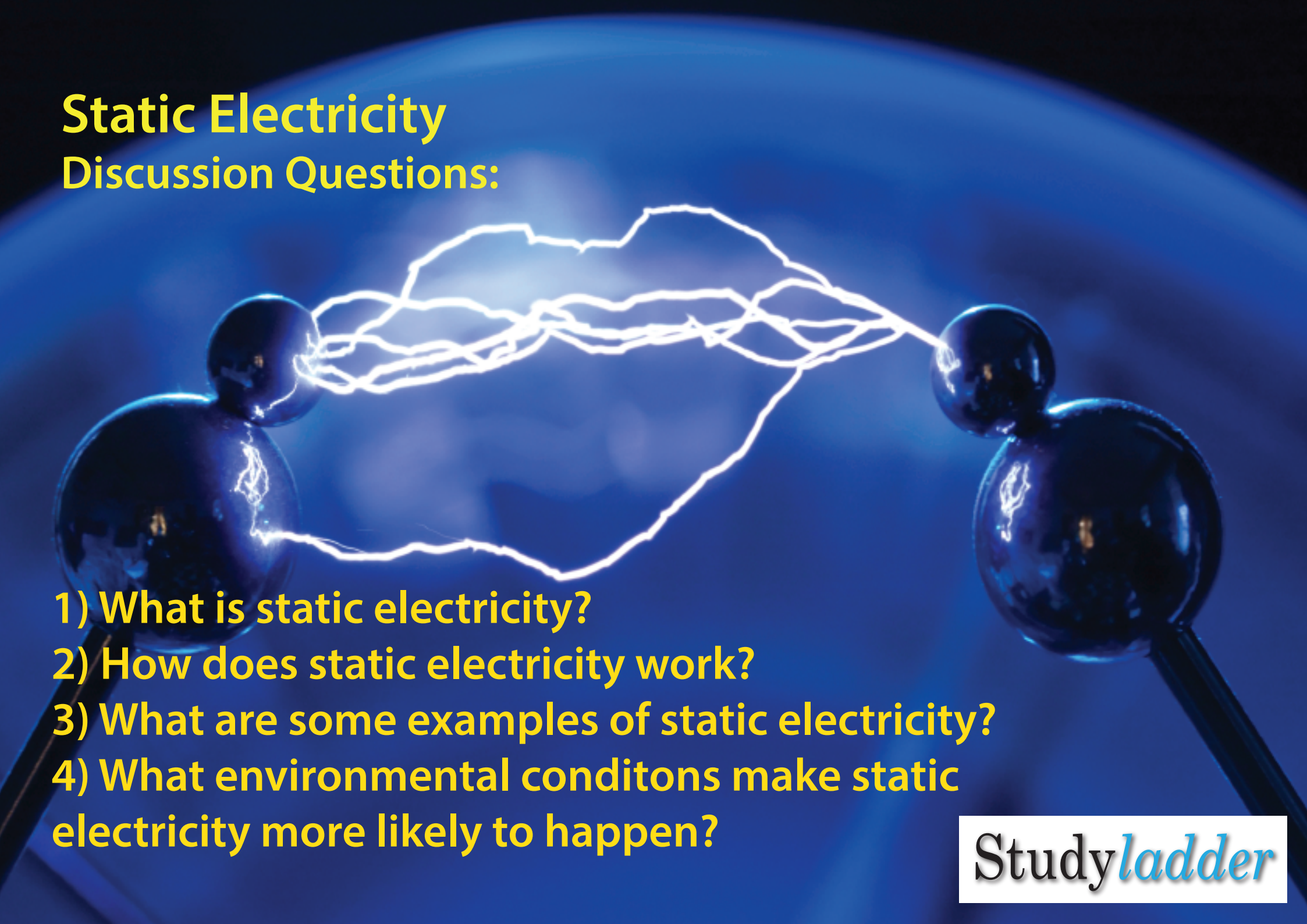
Static Electricity

Discussion Questions:



1) What is static electricity?
2) How does static electricity work?
3) What are some examples of static electricity?
4) What environmental conditons make static electricity more likely to happen?

What is Static Electricity?

If you have ever walked across the carpet, reached for the door handle and received a nasty shock then you have experienced what we call static electricity!

If you have ever pulled off your woollen hat and found your hair standing up then you have experienced static electricity!

If you have ever found your clothes crackling and sticking to your body when you move then you have experienced static electricity!

In order to understand what causes static electricity we need to understand a little about the structure of matter.

If you were able to break matter down to the smallest building blocks you would be looking at atoms. It is here where the story of static electricity starts.

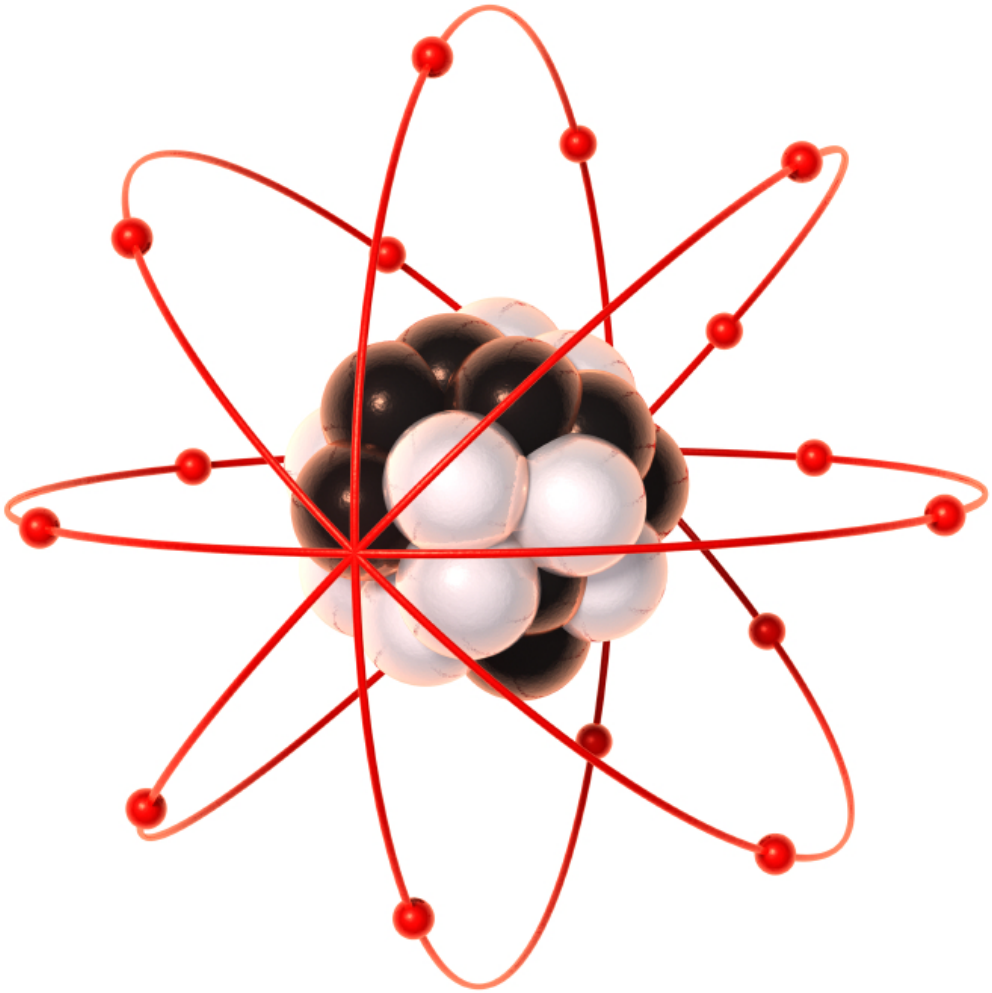
Atoms

All matter is made of of atoms. Every atom is made up of a nucleus and one or more electrons that move around it.

The nucleus is at the centre of the atom and it contains protons and neutrons. The number of protons and neutrons depends on what element the matter is made from. Oxygen, for example has 8 protons and 8 neutrons, surrounded by 8 electrons, whereas hydrogen only has a single proton and a single electron.

The protons are positively charged and the electrons are negatively charged. When there are an equal number of positive and negative charges, the atom is neutral.

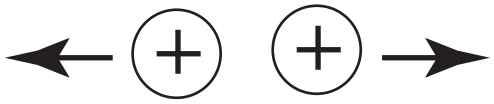
Some of the electrons in the outer part of the atom are able to move from one atom to another. When an atom has more protons than electrons it becomes positively charged. If there are more electrons than protons the atom is negatively charged.



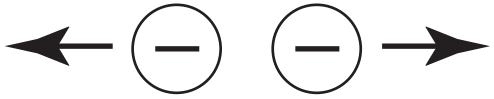
How does static electricity cause a bad hair day?

When you play on the plastic slide at the playground, for example, electrons from your hair may move to the plastic slide as you rub against it. This leaves a build up of positive charge in your hair.

Opposite charges are attracted to eachother.



Positive charges repel eachother.



Negative charges repel eachother.

Because like charges repel, your positively charged hair strands try to get as far away from each other as they can! This is what causes your bad hair day!

Static Shock

When your shoes rub along a carpet, electrons from the carpet transfer to your shoes and in turn to you. As you continue to walk around, electrons build up a negative charge in your body.

When you touch something metal or something moist or another person, you may feel a sudden shock. This is an arc of static electricity. This happens when the electrons that have built up in you rush to be absorbed into the positive atoms of the object you touch. Ouch! It can be quite painful.

Static can also build up in your body when you move around in your clothes or sit on a cloth chair.

Static buildup happens more often in cold, dry air and when your body is in contact with synthetic materials such as nylon carpets and clothes.