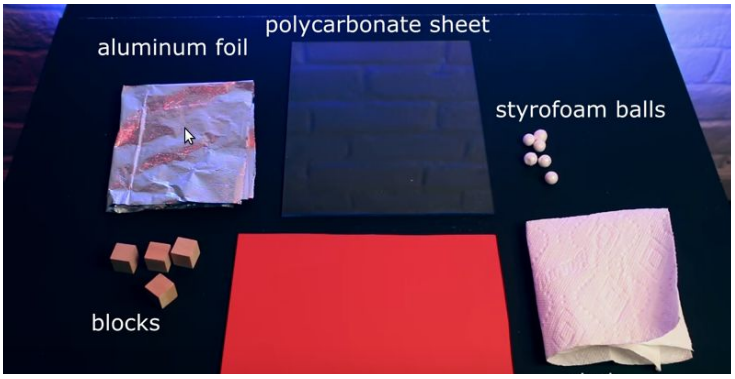
APPLICATION OF STATIC ELECTRICITY

STATIC ELECTRICITY:

Static electricity is an imbalance of electric charge inside or on the surface of the material.
The charge remains on the surface until it is removed by means of an electric current or electrical discharge. Static electricity is named in contrast with current electricity,
which flows through wires or other conductors and transmits energy.

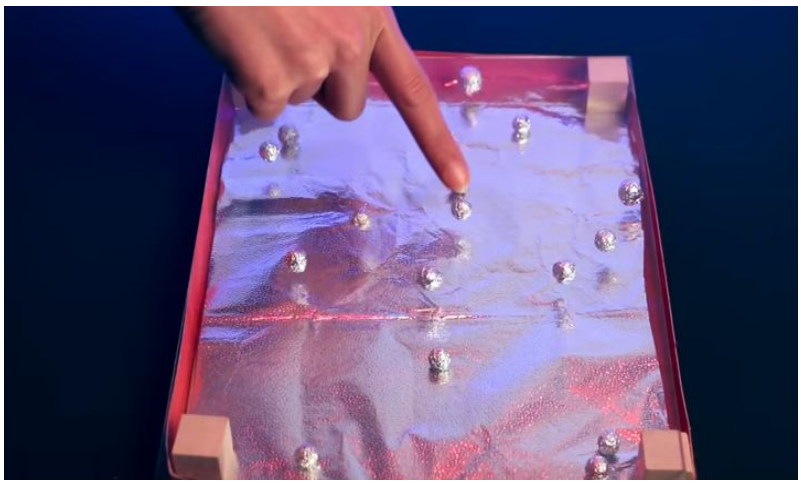
List of the materials required:

- polycarbonate sheet
- styrofoam balls
- aluminium foil
- wooden blocks
- piece of cloth



MAKING:

We fix wooden blocks at the corner of a small cuboidal box and put a polycarbonate sheet over it. Then we wrap the styrofoam balls with the aluminium foil and put it beneath the polycarbonate sheet.

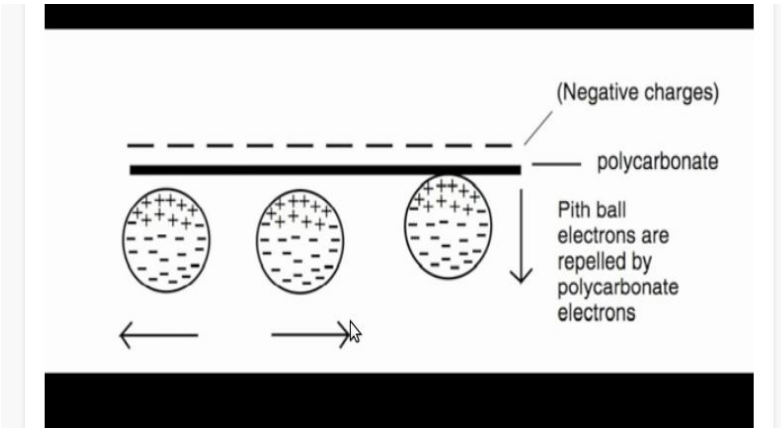


PRINCIPLE:

The driving principle is the principle of static charge which is responsible for the random movement of the balls.

WORKING:

Initially the balls and the sheet are neutral so we observe that the balls are attached to the polycarbonate sheet and remain at rest.



Rubbing the sheet with a hand or forearm, a towel, or piece of fur will give it a static electric charge that will cause styrofoam balls to bounce and race around it's surface. The balls will continue to move until the charges on the sheet and

balls are balanced. By bringing the hand close to the ball will unbalance the charges, causing the balls to race around again. This is because the balls and the sheet are neutral initially.

APPLICATION:

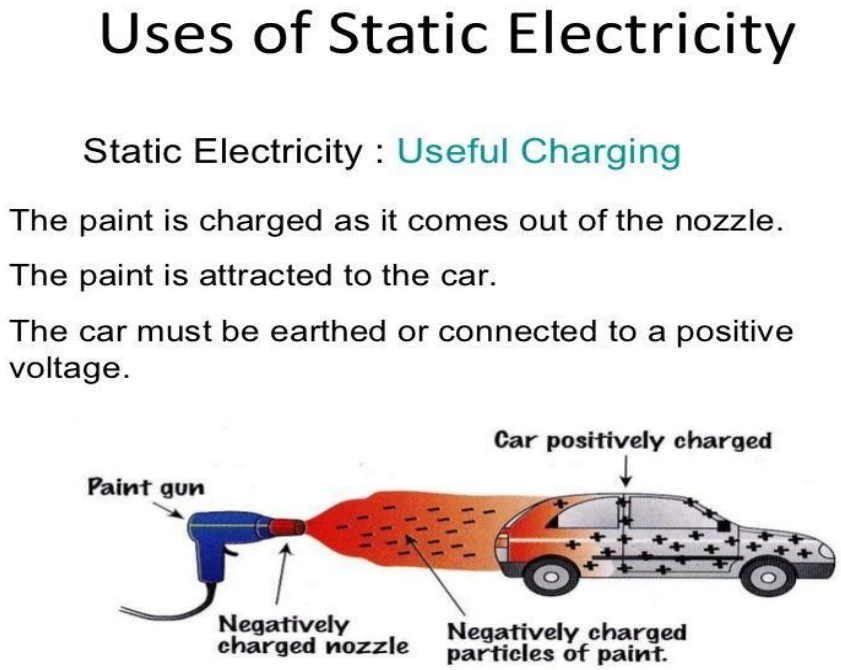
This project is just a application of static charge. We use static charge in various places such as:

Dust removal: There are some appliances that can eliminate dust from the air, like air purifiers. They use static electricity to alter the charges in the dust particles so that they stick to a plate or filter of the purifier that has an opposite charge as that of the dust (opposite charges attract each other).

This effect is also used in industrial smokestacks to reduce the pollution that they generate, although they work in a very large scale, the effect is basically the same as the home air purifier.

Photocopy: Copy machines use static to make ink get attracted to the areas where we need the information copied. It uses the charges to apply the ink only in the areas where the paper to be copied is darker (usually this means text or other information) and not where the paper is white, this process is called xerography.

Car painting: To make sure a car's paint is uniform and that it will resist the high speeds and weather to protect the car's metal interior, it is applied with a static charge. The metal body of the car is submerged in a substance that charges it positively, and the paint is charged negatively with the paint sprayer.



This process ensures a uniform layer of paint, since when there is enough negative paint in the car the extra will be repelled by the paint already in the car.

It also ensures that the paint won't fall off, since the electrical attraction between the paint and the car is stronger than if it was just sprayed.