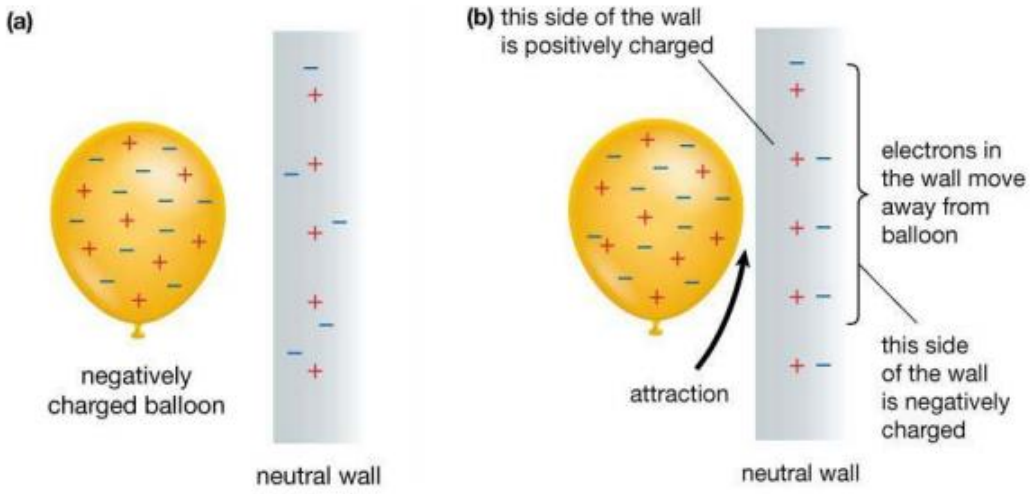
Static Electricity: Charging by Induction and Contact | Grade 9, Physics

Overview

When you rub a balloon against your sweater, the balloon gains a negative charge due to charging by contact. The wall has an equal number of positive and negative charges, so it is neutral. Bringing the negatively charged balloon near to the wall causes the electrons in the balloon to repel the electrons in the wall from the balloon. This is known as an **induced charge separation**. Induced charge separation leaves a positive charge on the surface of the wall closest to the balloon. This temporary charge in the wall is an example of **charging by induction**. A portion of the neutral object (the wall) was charged by bringing a charged object (the balloon) close to it. The figure shows how induced charge separation allows a negatively charged balloon to stick to a neutral wall.



The negatively charged balloon is attracted to the positively charged section of the wall. This is why the balloon can stick to the wall. This induced charge is only temporary. The electrons in the wall will move back to their original position once the charged balloon is moved away.

Induced Charge Separation: a shift in the position of electrons in a neutral object that occurs when a charged object is brought near it.

Charging by Induction: charging a neutral object by bringing another charged object close to, but not touching, the neutral object.