A grid of glowing green spheres is arranged in a 4x4 pattern on a blue background. The spheres have a gradient from dark green to bright green, with a bright highlight on the top-left of each sphere. The text is overlaid on the left side of the grid.

**Protons,
Neutrons
and
Electrons**

Objectives:

1. To be able to explain, in terms of protons and electrons, why a charged object is attracted or repelled by another charged object.
2. To be able to explain why a charged object can even be attracted to an uncharged object.
3. To be able to explain that the attraction between positive protons and negative electrons holds the atom together.

What are the three different tiny particles that make up an atom?

protons, neutrons, and electrons

Which of these is in the center of the atom?

protons and neutrons

What zooms around the nucleus of an atom?

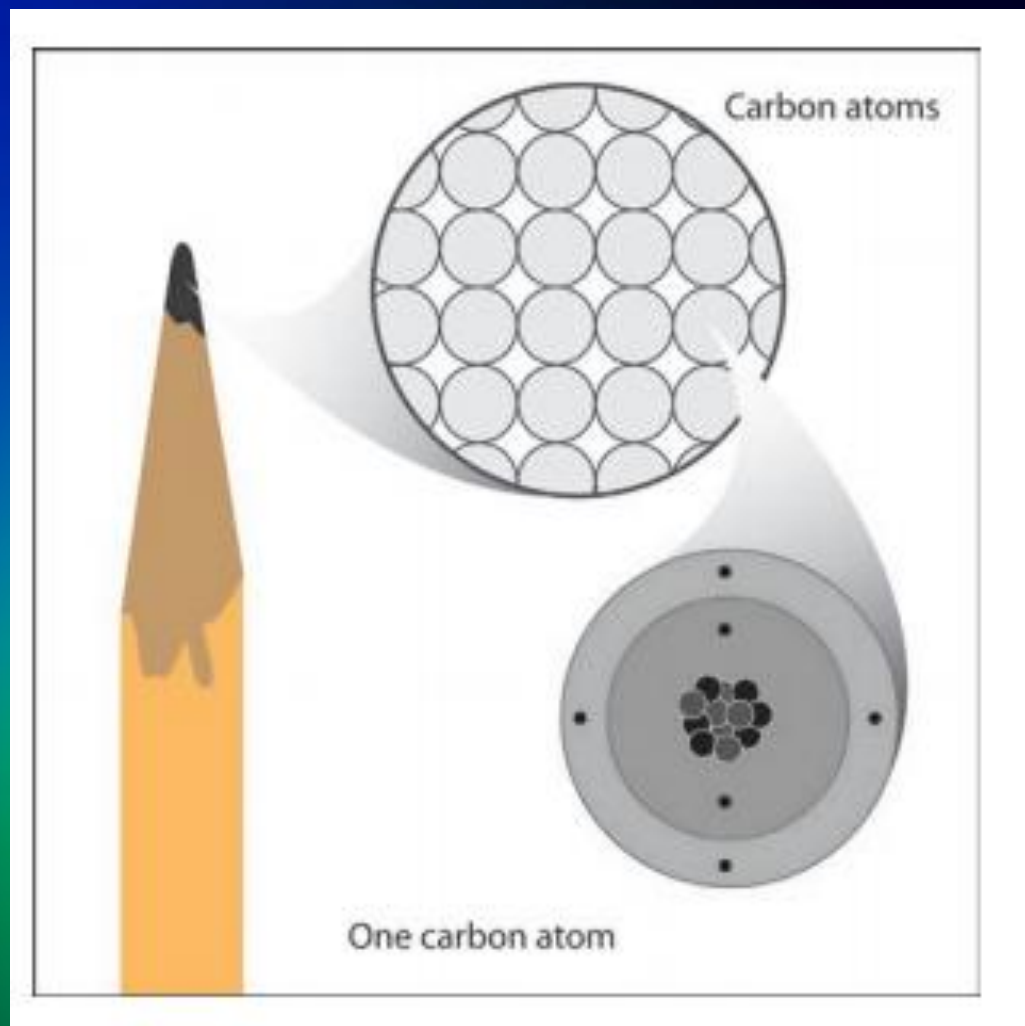
electrons

Which one has a positive charge? A negative charge?

No charge? Proton +

Electron -

Neutron (no charge)



Animation of Protons An Electrons

[protons and electrons](#)

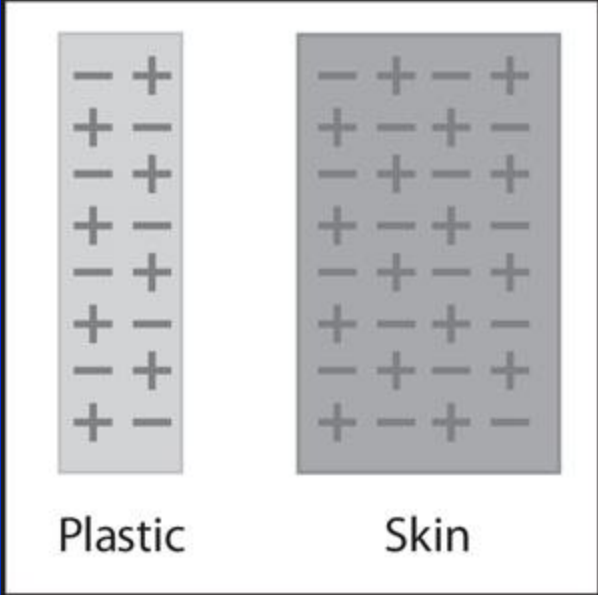
Hydrogen Atom

[hydrogen atom](#)

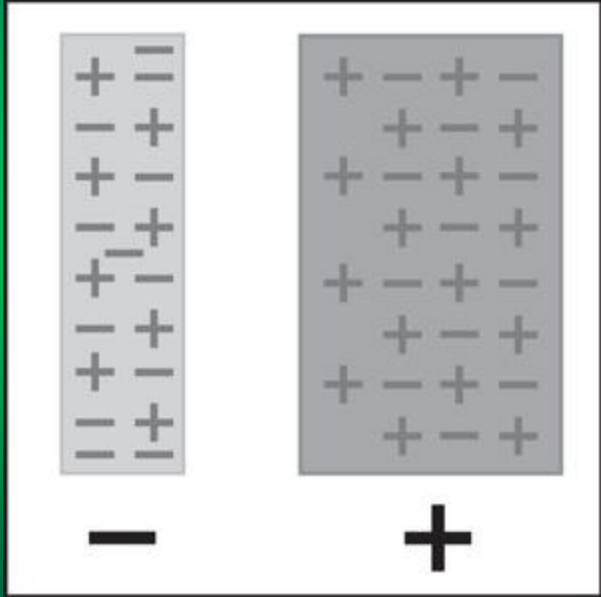
Activity:

- What makes objects attract or repel each other?
- Do the activity, Parts 1, 2 and 3 with your group. **8 min**





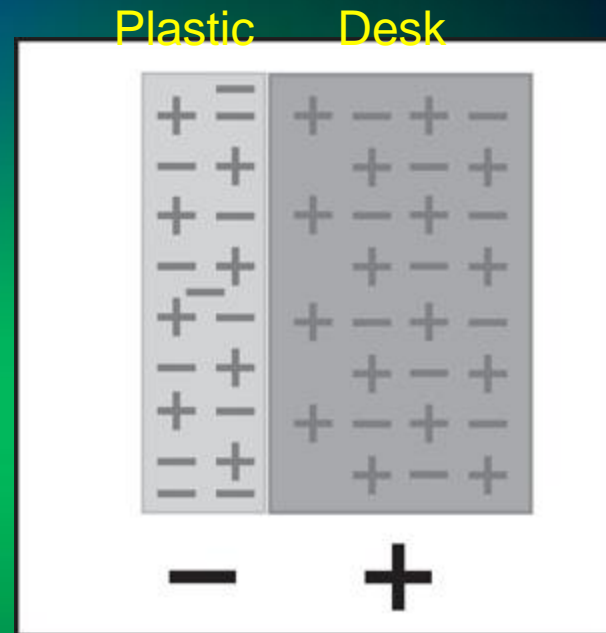
When the plastic strip is rubbed on the skin, electrons from the skin are transferred to the plastic giving the plastic a negative charge.



When the plastic is moved near the desk, electrons in the desk are repelled by the negatively charged plastic.

This leaves an area of positive charge in the desk near the plastic.

The negative plastic and the positive area of the desk attract.



Key Concepts:

- 1. Atoms are made of extremely small particles called **protons**, **neutrons**, and **electrons**.
- 2. **Protons** and **neutrons** are in the center of the atom, making up the nucleus.
- 3. **Electrons** surround the nucleus.
- 4. **Protons** have a positive charge.
- 5. **Electrons** have a negative charge.

Continued on next slide

Key Concepts continued...

- 6. The charge on the proton and electron are **exactly the same but opposite**.
- 7. **Neutrons** have no charge.
- 8. Since opposite charges attract, **protons** and **electrons** attract each other.

Take it Further

- Watch the animation of balloons and static electricity and do the activity on your lab activity sheet.

When the balloon is rubbed on hair or clothes, electrons move onto the balloon giving it a negative charge.

When the negatively charged balloon is brought near the water, electrons are repelled and move away from the balloon, leaving a positive area of the water near the balloon.

The negatively charged balloon and the positive area of the water attract.