

Electricity

3 HAVO - VWO TTO Physics

Maarten Becx (BXM)

Mencia de Mendoza Lyceum, Breda

Oktober - December



General Information

Contact BXM

- Email: mbecx@mencia.nl
- Website: www.becxlibrary.nl
- Teams: Maarten Becx
- Classroom: C2.02

Structure

- **Website info:** This is the place where all the materials that you'll need for my lessons are located and stored. *Please notify me when something is missing or if there are any mistakes. Thank you!*
- **Questions:** Use email for important cases and teams for physics questions.

Don't forget!

- The universe is under no obligation to make sense to you. Dare to ask your questions!

Important information

List of materials

- Pen (Writing)
- Pencil (Drawing)
- Protractor (*Extra ruler*)
- Normal calculator (*Non-graphical and/or programmable*)
- Book; Polaris Physics, Chapter; Electricity

Tips

- Use these slides for structure
- You are always allowed to draw and mark on the test. The paper with the questions will be handed in and has no influence on your mark. Your own answer sheet will be graded
- Make sure that you're always working carefully and structured
- You can always ask me for help! :)

Introduction; Electricity



Figure: Nikola Tesla



Introduction; Electricity



Figure: Lightning



Figure: Lightning



Figure: Light Bulb

Introduction; Electricity

Electron

- The story of a single particle; the negatively charged particle.

e^-

Current

- This particle is the reason electricity can flow through an "electric" system.

Rule

- An electron is always attracted to a proton (positive side).



Introduction; Electricity

Atomic models through history

- A journey through history in pursuit of understanding the electron.

ATOMIC MODELS

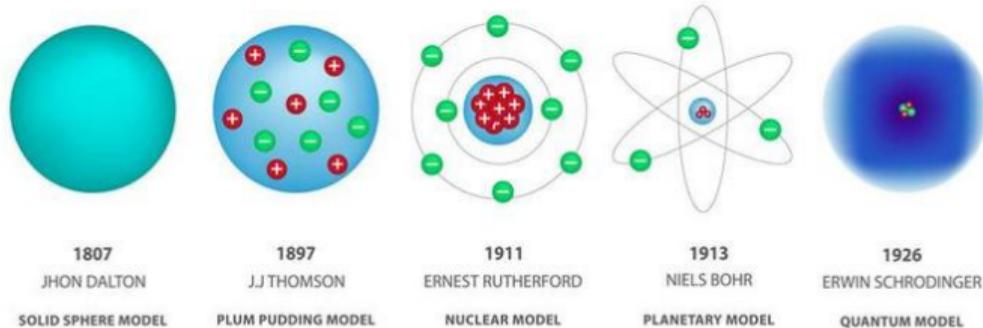


Figure: Atomic models

Introduction; Electricity

Notation

- Electrons [${}^{-1}_0e^{-}$] (Blue)
- Protons [1_1p] (Red)
- Neutrons [0_0n] (White)

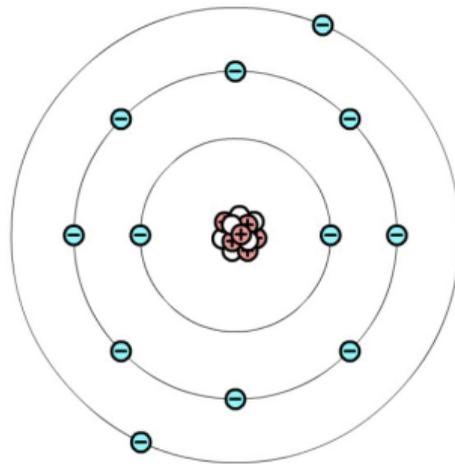


Figure: Atomic model of Niels Bohr

Static electricity

- Rubbing a balloon on hair or wool transfers electrons to the balloon, giving it a negative static charge. When the balloon approaches a neutral ceiling, the ceiling's charges polarise: electrons shift slightly away and a thin layer of positive charge forms at the surface. The attraction between the balloon's negative charge and this induced positive layer makes it stick—until the charge gradually leaks away, especially in humid air. *In short words: surface charge buildup, stationary until it discharges.*

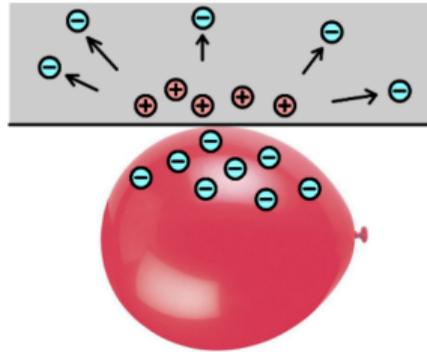


Figure: Static electricity proven with a balloon

Wimshurst machine

- Static electricity proven with the Wimshurst machine. Electrons and protons are separated and therefore a change in charge. When the difference in charge is great enough, the negatively charged electrons move to the positively charged protons.

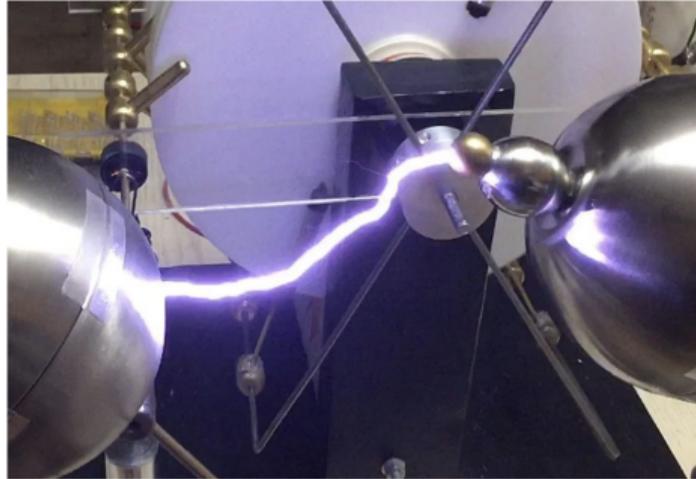


Figure: Wimshurst machine

Introduction; Electricity

Lightning

- With these experiments, we can prove that we understand this part of nature.



Figure: Lightning with charge symbols