



ELECTRICITY

PHYSICS

LEVEL 2

Strategy Guide

The electricity standard is all about linking topics you may have heard about in every day life together! The cool thing about it, is that it is the standard that is most easily applied to the real world. This is another standard worth 6 credits -so there may seem like a lot to learn, but by taking your time understanding each section, you can build your knowledge strategically. One of the best ways to tackle the subject, is to focus on one section a time - and get comfortable with the formulae and terminology of each section before linking them together.

OVERVIEW OF THE STANDARD

- Static electricity
- DC electricity
- Electromagnetism

STRUCTURE OF THE EXAM

Warning: this section is to help you focus your time/study. Our analysis is based off previous year's exams and is no substitute for understanding the concepts. NCEA can change the exam format without much notice, so the best strategy is to be prepared for anything!

There are generally 3-4 questions in this external. There is almost always a question involving a circuit - which will ask you to calculate different values for current, voltage, resistance and power. There will also be a question involving the concepts of electromagnetism and applying your knowledge of induction. Finally, there is almost always a question discussing electric fields and the way charges move within them. These questions will often give you a scenario or diagram to link your knowledge of electric fields to.

CONCEPTS AND SKILLS TO FOCUS ON

Although every aspect of the exam is equally important, here are some key concepts to focus your study on:

Calculating total resistance in series and parallel circuits:

Understanding resistance is a key way to show that you understand the differences between series and parallel circuits. This external expects you to be able to calculate total resistance over series and parallel circuits - as well as provide explanations for the differences between them.





Understanding how power relates to brightness:

One of the common ideas NZQA will try to trip you up on, is understanding that power directly relates to brightness. You will often get asked to compare the brightness of different bulbs, or discuss how adding or removing components to a circuit will change the brightness. The easiest way to do this is to relate the concepts to power, and do the relevant calculations to prove your point.

Understanding electromagnetic induction and forces on current carrying wires:

Electromagnetic induction and induced force can be the most intimidating parts of the topic - as they are often the concepts students have not have heard of before. Make sure you have a thorough understanding of the right hand rule, as well as how force and current are induced in different experiments and contexts. A good way to get used to these is to go through past exam papers - as the contexts often repeat themselves!

COMMON MISTAKES:

From the NCEA gods themselves:

Don't confuse electric fields with magnetic fields:

Because they are both new concepts (and have annoying similar names), lots of students can accidentally confuse electric fields with magnetic fields. It is important that you know the differences between them - and the formulae that you should apply to calculate each.

Convert to SI units:

The electricity standard will often try to trip you up by giving you numbers that are in the wrong units. It is important that you practice how to convert units such as kilo-volts into volts before you answer calculation questions.

Understand the formula sheet:

The formula sheet for electricity can seem pretty daunting at first - especially as there are a lot of new letters to deal with. A good way to study is to annotate your formula sheet and make sure you understand what each letter means - and the types of questions you are likely to use each equation in.

Practice using and applying the right hand slap rule:

Whilst tools like the right hand slap rule can help you answer physics questions, it is easy to get flustered in the exam and not implement them correctly. Make sure you practice using these rules in exam conditions, so that you are comfortable applying them on the day.

OVERALL STUDY AND EXAM STRATEGY:

The best thing about this standard is that it is nicely divided into three quite distinct sections. If you are feeling intimidated by the standard, try learning each one on its own - and tackling them one by one. It can help to visualise charge, and how it acts in different scenarios. Make sure you do lots of practice in exam conditions to avoid panicking in your exam.

