AQA Physics

THE subject to study through years 12 and 13

What you will study

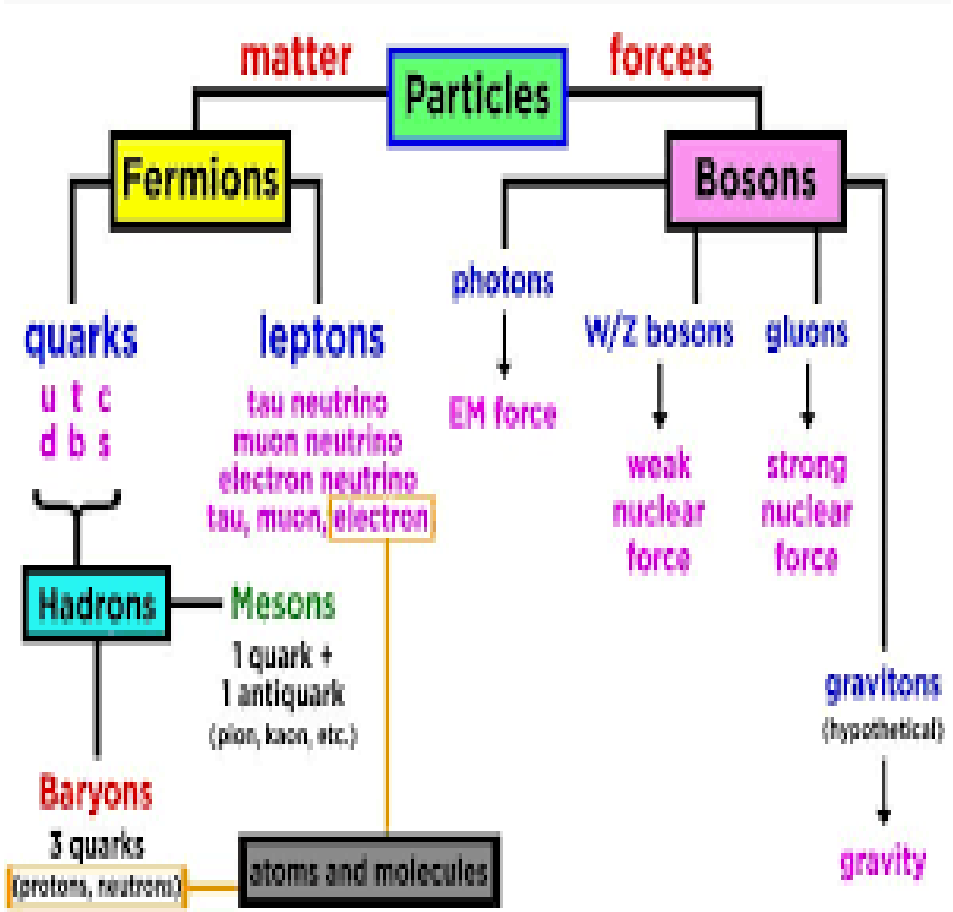
- Particles and radiation
- Waves
- Mechanics and energy
- Electricity

Year 12

- Further mechanics and thermal physics
- Fields
- Nuclear Physics
- + one option topic tbc

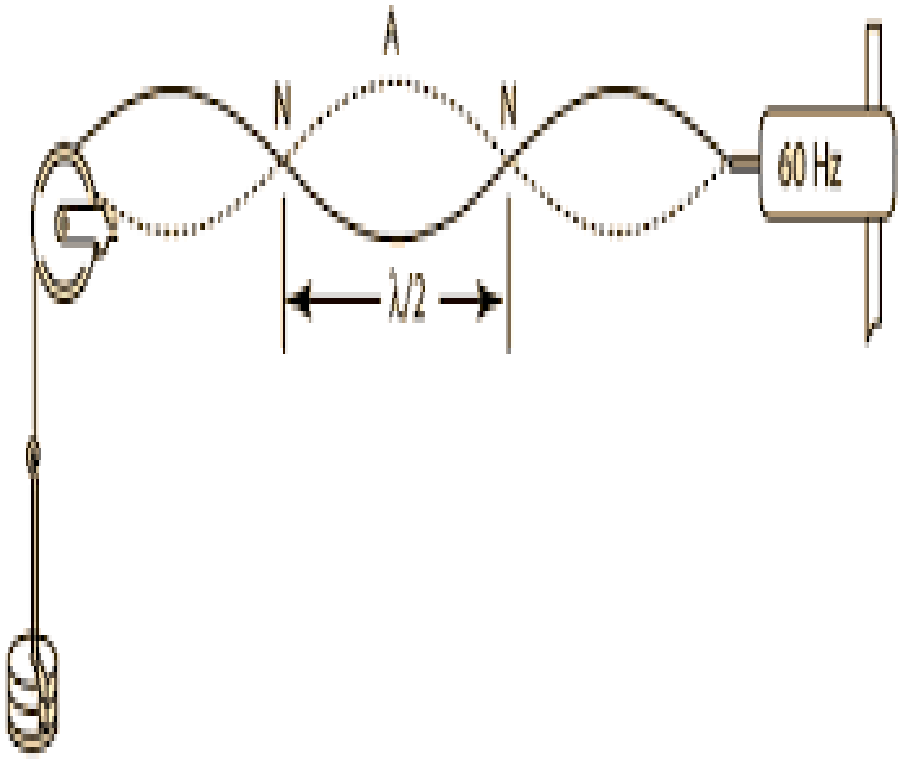
Year 13

Particles and radiation



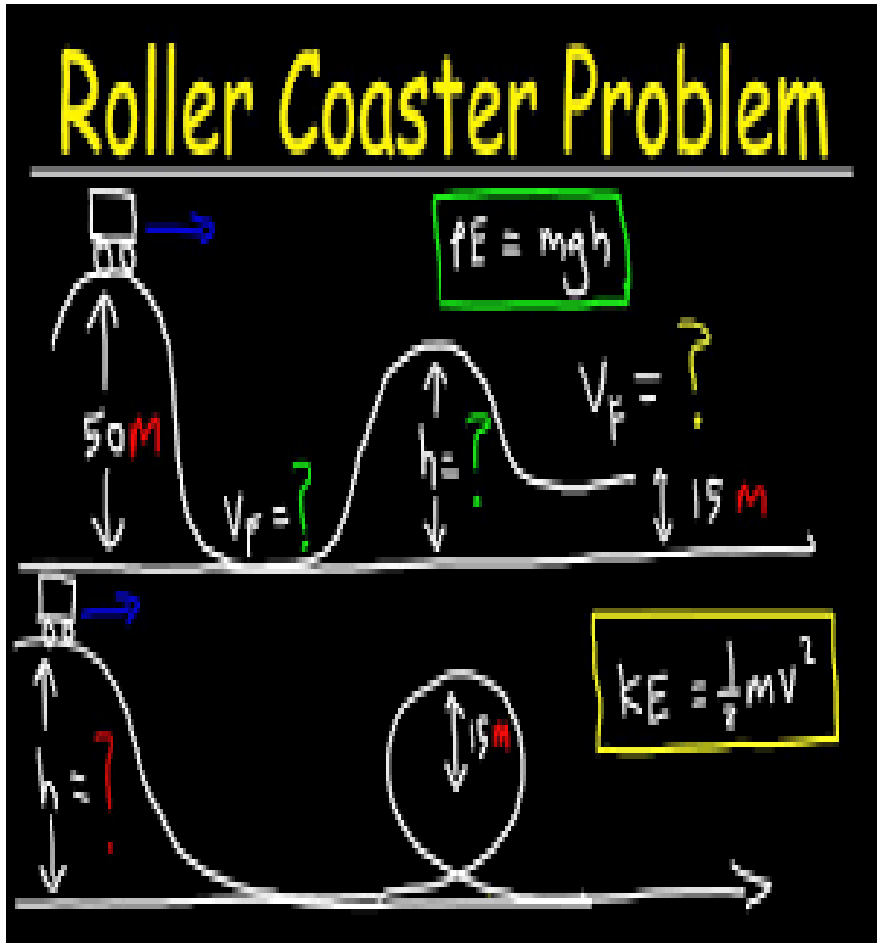
What exactly is “matter”?
What are neutrons and protons made of and how do we know?
Which “particles” are actually indivisible?
What forces operate at very small ranges so that an atom remains a viable entity?

Waves



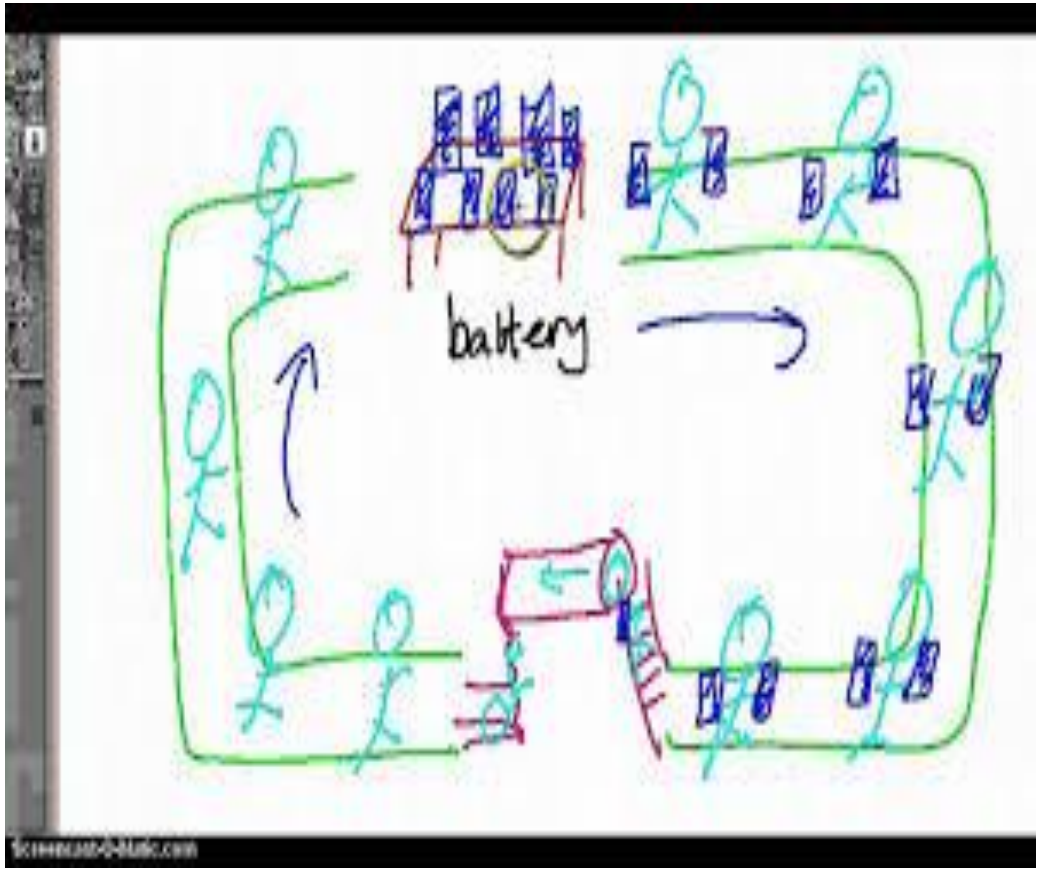
What are the properties of waves and how do we measure them?
What does diffraction and interference tell us about the nature of waves?
What causes a diamond to sparkle in visible light?
How can waves be used to determine the chemical composition of matter?

Mechanics and materials



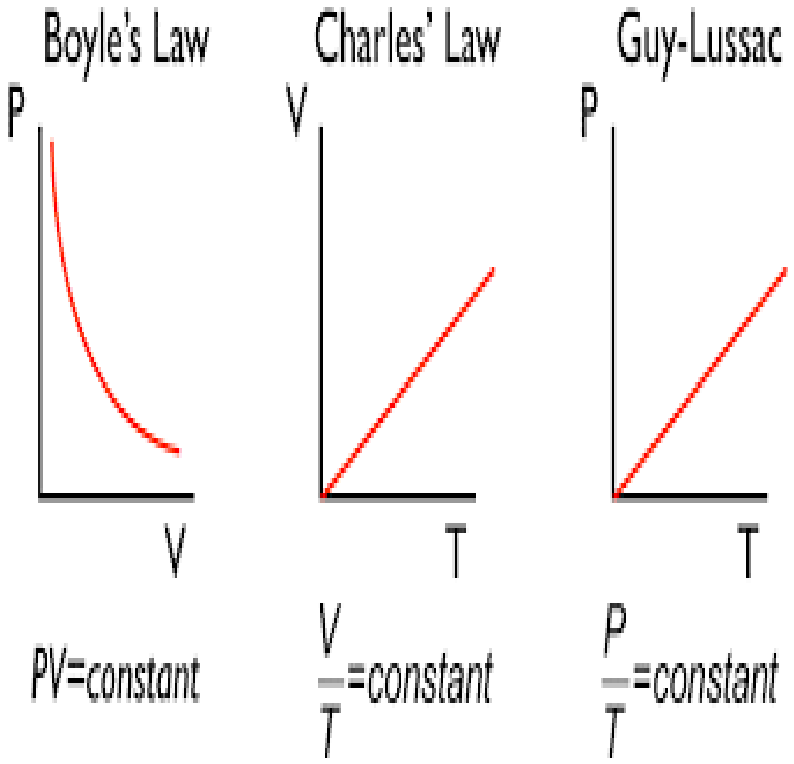
How are physics principles used to construct scary fairground rides that are also safe?
How can athletes use conservation laws and the equations of motion to maximise their performances?
How do we choose the correct materials for functions needed? How do we mathematically justify this?
How can you link your mathematical skills to real life physical problems involving motion?

Electricity



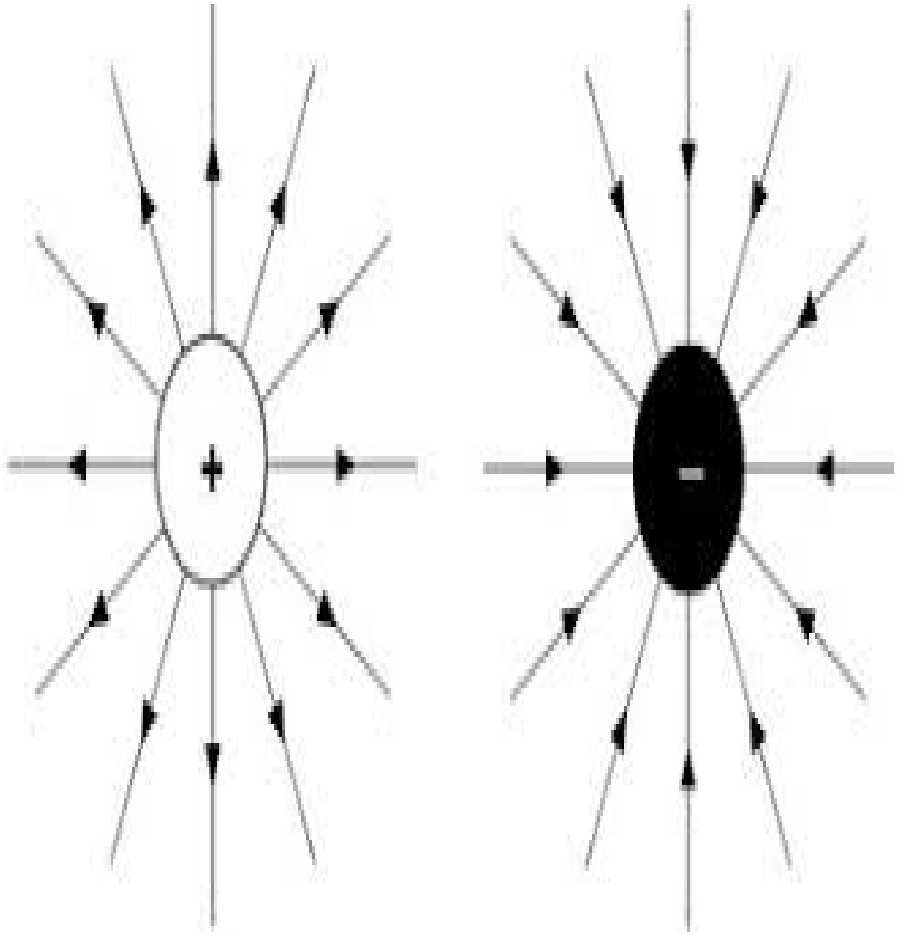
What exactly is electricity and how can it be controlled with components in circuits?
How is energy transferred in circuits?
What is a semi-conductor?
What are the properties of superconductors and how could they revolutionise future industries?
What are potential dividers and how are they used?

Further mechanics and thermal physics



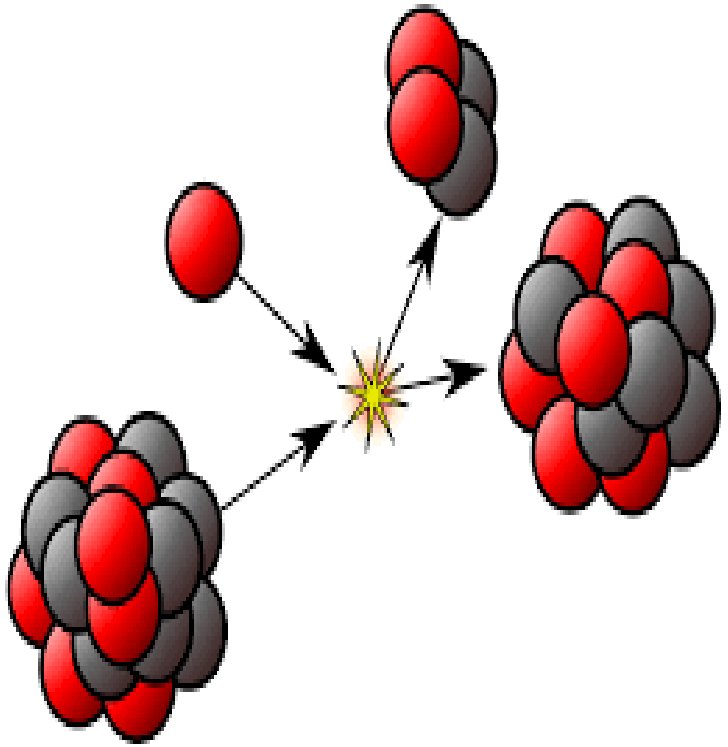
How can we relate the linear world of force and acceleration to object moving in circular pathways?
What do we need to consider damping and resonance in engineering and acoustics?
How have Newton's Laws inspired the design and creation of machines and engines that powered the industrial revolution.
How have we combined theory and experimental observation to build up an understanding of the behaviour of gases.

Fields



What characteristics do electrical, magnetic and gravitational fields share and how does this effect the objects they act upon?
Why do satellites orbit the Earth and how can we control their motion?
What is a capacitor, and how can they be used in timer circuits and rectification of alternating to direct current?

Nuclear physics



How do key principles of scientific advancement link to our understanding of radioactivity?
What is meant by instability?
How has radioactivity furthered our knowledge of the structure of matter?
What are nuclear fission and fusion?

Practical work

- Continuous and integral throughout the 2 year course.
- A practical endorsement will be continuously updated via a series of assessed practical activities designed to test you planning, data collecting, analysing and evaluating skills. Opportunities will occur throughout the course to develop your practical skills over the 2 years.
- Your performance in completing the practical endorsement component forms part of your final grade.

Other skills

- Studying the history of scientific advancement.
- Relating theory to observation, and the development of scientific models.
- Application of mathematical skills to solve complex problems.
- Reliving key ground-breaking experiments and breakthroughs in physics.
- Studying current developments.
- Building on answering questions beginning “how” and “why” concerning the universe we inhabit.

Terminal Exams

- **Paper 1. 85 Marks**
- Sections 1-5 and 6.1.

- **Paper 2. 85 Marks**
- Sections 6.2, 7 and 8.

- **Paper 3. 80 Minutes**
- Practical skills and data analysis and Options topic.