

YEAR: 10 Science (Double Award) Physics, Intro to CHEM

Knowledge Focus: 3.4 Domestic Electricity, 3.5 Features of Waves, START Chem
2.1 The Nature of substances and chemical reactions



Skills, knowledge and understanding to be developed in this Learning Plan:

The functions of fuses and other devices which are designed to prevent current flow when faults develop in domestic circuits. It compares the cost effectiveness of using different renewable energy sources. The basic properties of transverse and longitudinal waves and the differences between them. The ideas of elements as pure substances; compounds as substances in which different atoms are chemically joined together and mixtures as substances in which particles are not chemically joined.

Key terms to be learned in this

LP: kilowatt, alternating current, direct current, energy banding, transverse, longitudinal, amplitude, wavelength, reflection, refraction, formulae, ionic compounds, ions, percentage yield

Week 1 - 2 Learning Objectives: 3.4 Domestic Elec

How can we measure electricity and how much bills will be? units used (kWh) = power (kW) × time (h)

$$\text{cost} = \text{units used} \times \text{cost per unit}$$

What are 'efficiency ratings' on electrical goods?

The energy banding (A-G) and the power ratings of domestic appliances.

What is the difference between 'mains electricity' in domestic settings (A.C.) and batteries (D.C.)?

How can we keep safe with electricity in the home?

Fuses, fuse ratings, MCCBs & RCCBs.

The cost effectiveness of introducing domestic solar and wind energy equipment.



Objective assessments:

Be able to:

Calculate kilowatts and kilowatt hours.

Recognise that energy banding links to efficiency.

The difference between AC & DC.

Describe features of plugs and fuses and the 'ring main'.

How to investigate energy transfers in a range of contexts.

Homework:

Set:
Due:

Homework:

Set:
Due:

Assessment
3.4 End of Topic



Week 3 - 4 Learning Objectives: 3.5 Features of waves

Energy can travel as a wave but how can we best describe this energy transfer?

What is the difference between transverse and longitudinal waves?

From x-rays to radio waves; how do the different regions of the EM spectrum compare in terms of uses, properties and danger?

How fast do waves travel?

Use the equations:

$$\text{wave speed} = \text{wavelength} \times \text{frequency and}$$

$$\text{speed} = \text{distance}/\text{time}$$

How can we use satellites to communicate around the planet?

Assessment
3.5 End of Topic

Objective assessments:

Be able to:

Describe the parts of waves including calculations.

Know the parts of the EM spectrum, uses & dangers.

Calculate wave speed given the 2 equations.

Understand the difference between geosynchronous and geostationary orbits.

Specified Practical

Investigation of the speed of water waves

Homework:

Set:
Due:

Homework:

Set:
Due:

Week 5 - 7 Learning Objectives: 2.1 Nature of substances

What is the basic component of matter? Elements can't be broken down into simpler substances.

How can we show atoms and elements, even though we can't see them? Chemical symbols, chemical formulae & simple molecules using a diagram and key.

How can we write chemical formulae of ionic compounds?

Relative atomic mass and relative molecular mass.

The percentage composition of compounds

How to separate molecules in mixtures by physical processes.

Chromatographic data analysis and *R_f* values

What are the signs of a chemical reaction?

Chemical reactions using word equations

How to represent chemical reactions using balanced chemical equations.

The percentage yield of a chemical reaction.



Objective assessments:

Be able to:

Describe the difference between elements, compounds & mixtures.

Know what an ion is and how ionic compounds are formed.

Calculate RAM and RMM and % composition of compounds.

Calculate *R_f* values.

Know the signs of a chemical reaction.

Write a word equation.

Calculate the % yield of a chemical reaction.

Assessment

2.1 End of Topic

Homework:

Set:

Due:

Homework:

Set:

Due:

Homework:

Set:

Due: