



Year 7 Physics - Energy

Learning about this topic is important because: Energy is vital for living things to survive. We get our energy from food, plants get their energy from the sun and cars get their energy from petrol or perhaps electricity. We use different energy resources like natural gas to generate electricity, but some of these resources are running out, so it is important to know about the advantages and disadvantages they have in order for everyone to say how they think we should get our electricity.

This builds on: In years 5 & 6, you learned about some types of energy, including transfers by light and electric current, but mostly this topic will be new to you.

This leads to:

We cannot study Physics without knowing about Energy. This year, you will learn more about Light and Sound and how they transfer energy using waves. In Year 8, you will learn how thermal (heat) energy is transferred in Heating & Cooling and how energy is transferred electrically in Electric Circuits. In Year 9, you will learn more about radiation in Waves and more about electrical transfer in Resistance.

We will learn:

1. to name and identify the main energy stores and give examples.
2. to describe energy transfers, identify pathways in examples and interpret Sankey diagrams.
3. to explain dissipation and wasted energy transfers and calculate efficiency.
4. to use the equation that links power, energy and time.
5. to recognise and use the kilowatt-hour (kWh) as a unit of energy and to interpret domestic energy bills.
6. about renewable and non-renewable energy resources.

We will develop/practise skills including:

- Collecting data
- Using and rearranging equations
- Converting units

Some of the vocabulary that we will use includes:

energy store: a source of energy that can be utilised later

energy transfer: the passing on of energy from one energy store to another energy store

thermal energy store: filled when an object is warmed up

chemical energy store: emptied during chemical reactions when energy is transferred to the surroundings

kinetic energy store: filled when an object speeds up

gravitational potential energy store: filled when an object is raised

elastic energy store: filled when a material is stretched or compressed

joule (J): unit of energy, **kilojoule (kJ):** 1000 joules

dissipation: the transfer and spreading out of energy stores into less useful forms

power: amount of energy that something transfers each second

watt (W): unit of power, or rate of transfer of energy, equal to a joule per second, **kilowatt (kW):** 1000 watts

fuel: a concentrated store of energy (usually chemical) that can be released by burning

fossil fuels: fuels made from things that were living millions of years ago

non-renewable energy resource: a finite energy resource that cannot be replenished

renewable energy resource: an energy resource that can be replenished as quickly as it used

You could learn more about this topic by:

- looking at the Energy topic in BBC Bitesize,
- watching videos on this topic by Revision Monkey
- Revision and quizzes on EDUCAPE.

Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are: Energy Transfers and Efficiency (Lesson 3) and Energy in the Home (Lesson 5).

Year 7 Physics - Energy



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Year 7 Physics - Forces

Learning about this topic is important because: Forces are all around you. When forces cause movement you can see what they do, but when something is not moving there are still forces at work. Forces are involved in some way in almost everything you do.

This builds on: Building on your prior knowledge of forces, including simple machines, where you explored resistance forces such as air and water resistance and friction.

This leads to:

This unit deepens your understanding by introducing forces as interactions between objects, including contact and non-contact forces, using diagrams and measurements. This helps you to contextualise how forces affect motion before you progress to the next unit, Hidden forces, in Yr 9, where you will explore more complex concepts like turning forces, forces that hold objects on surfaces and buoyancy.

We will learn:

1. to describe what forces are and identify some common forces.
2. to measure forces using a spring balance or newtonmeter.
3. to identify balanced and unbalanced forces and work out the size of a resultant force.
4. to describe the effect of forces and explain the effect of balanced and unbalanced forces on the speed of objects.
5. Describe and explain what causes friction and how it can be reduced.
6. Carry out an investigation about how weight affects friction.

We will develop/practise skills including:

- Collecting data
- Using and rearranging equations
- Converting units

Some of the vocabulary that we will use includes:

force: push or pull between interacting objects.

contact force: only acts when objects are touching.

non-contact forces: forces that exist between objects with or without touching.

weight: the force of gravity acting on an object.

tension: the pulling force transmitted along a string, rope, cable, etc.

driving force: the force pushing something forward.

upthrust: the upward force exerted on an object in air or water.

friction: the force of one surface gripping or rubbing on another.

drag forces: resistive forces acting on objects moving through air or water.

balanced forces: forces on an object that act in opposite directions and are equal in size.

resultant force: a single force that could replace all of the forces acting on an object and still have the same effect on the object.

lubricant: a substance used to reduce friction.

You could learn more about this topic by:

- looking at the Forces topic in BBC Bitesize,
- using Educake





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Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are: Investigating friction (Lesson 5) and end of unit test.



Year 7 Physics - Space

Learning about this topic is important because: **This unit explores gravity as the force between masses, including weight calculation using gravitational field strength. It covers the relationship between Earth, the Moon, and the Sun, the concept of light years, and seasonal changes due to Earth's tilt.**

This builds on: **In primary science, you learnt about the cause of day and night, the movement of the Earth orbiting the Sun and the Moon orbiting the Earth, and about stars and planets we can see in the night sky.**

This leads to: **This unit will prepare you for studying about Space at GCSE, where you will delve deeper into the effects of gravity on orbits, the formation of celestial bodies, and evidence supporting theories about the universe's expansion.**

We will learn:

1. To describe how the motion of Earth can explain day, night and a year, and describe the motion of the Moon can explain why it appears to change shape.
2. To describe our solar system, including ideas about the locations, movements, sizes and distances of the different objects within it.
3. To describe the effects of gravity.
4. To describe what stars and galaxies are and explain how they look when seen from Earth.
5. To explain why the heating effect of the Sun is greater at midday than at sunrise.
6. To explain why it is winter in the southern hemisphere when it is summer in the northern hemisphere.
7. To explain how and why the seasons change, and why some countries do not have summers and winters.
8. To describe how and why our understanding of the position and motion of Earth has changed over time.

We will develop/practise skills including:

- Making observations
- Using and rearranging equations
- Converting units

Some of the vocabulary that we will use includes:

Day – the time it takes for Earth to complete one spin on its axis

Year - the time it takes for Earth to orbit the sun

Star – an extremely large sphere of hot gas that emits light

Planet – a very large sphere of rock or gas that orbits a planet

Dwarf planet – a large round object that orbits a star but is not big enough to clear its orbital path of other debris

Asteroid – a small rocky object that orbits the sun

Solar system – the sun and all the objects that orbit around it

Gravitational force - a force that pulls objects towards larger objects like planets, moons and stars

Light year – the distance light travels in one year

Galaxy – a group of billions of stars

Universe – the name for the whole of space and everything in it

You could learn more about this topic by:

- Watching videos on this topic by Revision Monkey
- Looking at the topic on BBC Bitesize
- Revision and quizzes on EDUCAKE.

Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are Educake quizzes and the end of topic test.