Your notes

KS3 Science: revision notes

P1.3 Energy

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Energy stores

- **Energy** is measured in **joules** (J). 1 kilojoule (kJ) = 1000 J.
- **Energy stores**: kinetic (moving objects), gravitational potential (objects raised up), elastic potential (stretched or squashed objects), thermal (hot objects), chemical (food, fuels and batteries), nuclear, magnetic and electrostatic.

Energy transfers

- **Energy** is transferred between stores mechanically (by a force), electrically (by a current), by heating, and by radiation (such as light and sound).
- **Energy** can't be created or destroyed, only transferred from one store to another. This is the law of **conservation of energy**.
- Food labels show **energy** in kJ. The body uses **energy** from food to move, grow, repair itself and keep warm.

Wasted energy and efficiency

- **Energy** that isn't transferred usefully is wasted. It usually spreads out (dissipates) into the surroundings as **thermal energy**, and sometimes as sound.
- **Efficiency** = useful **energy** out ÷ total **energy** in. Multiply by 100 for a percentage.
- A bulb that takes in 100 J and gives out 20 J of light is 20% efficient; the other 80 J heats the surroundings.
- Lubricating moving parts reduces friction, and insulation reduces heat loss, so less **energy** is wasted.

Heat and temperature

- **Temperature** (in °C) is how hot something is. It depends on how fast its particles are moving.

- **Thermal energy** depends on the mass, **temperature** and material. A warm bath has more **thermal energy** than a cup of boiling water, because it has much more mass.
- **Energy** flows from hotter objects to cooler ones until they reach the same **temperature**.
- **Conductors** (such as metals) let **thermal energy** pass through quickly. **Insulators** (such as plastic, wood, wool and air) let it pass slowly. Trapped air is a good insulator.

Your notes

Key terms

Energy	What is needed to make things happen, measured in joules (J).
Joule	The unit of energy.
Energy store	A way that energy is held, such as a chemical or kinetic store.
Kinetic energy	Energy stored in a moving object.
Gravitational potential energy	Energy stored in an object that is raised up.
Chemical energy	Energy stored in food, fuels and batteries.
Thermal energy	Energy stored in a hot object.
Conservation of energy	Energy can't be created or destroyed, only transferred.
Dissipation	Energy spreading out into the surroundings, becoming less useful.
Efficiency	The proportion of energy that is transferred usefully.
Temperature	How hot something is, measured in degrees Celsius (°C).
Conductor	A material that lets thermal energy (or electricity) pass through easily.
Insulator	A material that doesn't let thermal energy (or electricity) pass through easily.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is the unit of energy?
2. Which energy store increases when you lift a book onto a shelf?
3. Which energy store does food have?
4. What does the law of conservation of energy say?
5. A bulb takes in 100 J and gives out 20 J of light. How efficient is it?
6. What usually happens to wasted energy?
7. How many joules are there in 5 kJ?

8. What does a thermometer measure?

Answers

1. The joule (J)
2. Gravitational potential energy
3. Chemical energy
4. Energy can't be created or destroyed, only transferred
5. 20%
6. It spreads into the surroundings as thermal energy
7. 5000 J
8. Temperature

What to do next

Practise 14 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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