

Y7 - Knowledge organiser – 7.7 – Energy costs & Energy transfers



Energy models 1

- Jobs get done when energy is **transferred** from one store at the start, to another at the end.
- This energy can change form as it is being transferred
- These **energy stores** can have energy of different types in them.
- **Dissipated**: spreads out **wastefully**. Energy is dissipated, reducing the amount of useful energy.

Types of energy & energy stores 2

- **Light** energy
- **Nuclear** energy
- **Electrical** energy
- **Sound** energy
- **Thermal** energy store – filled when an object warms up.
- **Chemical** energy store – emptied during chemical reactions
- **Kinetic** energy store – filled when an object speeds up.
- **Gravitational potential** energy store: filled when an object is raised.
- **Elastic potential** energy store: filled when a material is stretched or **compressed**.

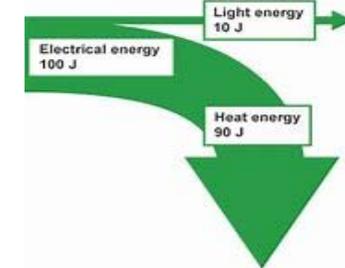
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Energy transfers 3

- When energy is transferred, the total amount is **conserved**.

$$\text{efficiency} = \frac{\text{useful output power}}{\text{input power}}$$

- Sankey diagrams



Calculating cost 4

- Electricity bills are calculated based on the amount of energy transferred.
- **Cost = Power x time x price**
- **Power** measured in **kiloWatts**
- Time measured in hours
- **Price** measured in **kiloWatt-hours**

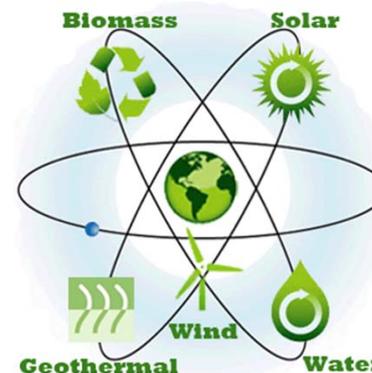
Keywords 5

- **Power**: how quickly energy is transferred by a device
- **Energy resource**: a store of energy that can be usefully released.
- **Fossil fuels**: non renewable energy resources formed from the remains of ancient plants or animals.

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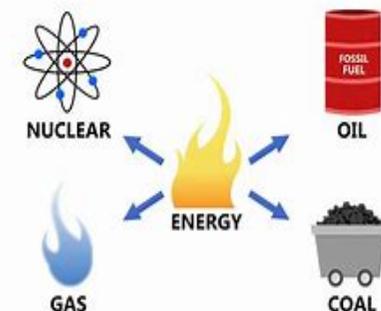
Renewable resources 6

- an energy store that can be replaced and will not run out.



Non renewable resources 7

- an energy store that cannot be replaced and will be used up.



Knowledge organiser quiz

1. How do you calculate the cost of energy? What is the equation?
2. What is power measured in?
3. What is power?
4. Name a non-renewable source of energy
5. Give 2 examples of renewable sources of energy
6. What is a renewable source of energy?
7. What is a non-renewable source of energy?
8. What diagram is used to show energy transfers?
9. How are electricity bills calculated?
10. Give 3 examples of energy stores.

Answers

1. Power x time x price
2. KW (kilowatts)
3. How quickly energy is transferred in a device
4. Fossil fuel, coal, oil, gas
5. Solar, wind, hydroelectricity, biomass, waves
6. A source that doesn't run out
7. A source that gets used up and will eventually run out
8. Sankey diagrams
9. Based on the amount of energy transferred
10. Thermal, kinetic, chemical, gravitational, sound, nuclear, electrical

Knowledge organiser quiz

1. Give 3 different examples of energy stores
2. What happens to an object when its thermal energy store increases?
3. What happens to the chemical energy store during chemical reactions?
4. Give an example of an object with kinetic energy
5. What happens to the gravitational potential energy store of an object when it is lifted up high?
6. Give an example of an object with light energy
7. What happens to the total amount of energy when energy is transferred from one form to another?
8. What diagrams can be used to show transfers of energy?
9. What does dissipated mean?
10. Give an example of an object that uses electrical energy

Answers

1. Nuclear, elastic, kinetic, electrical, light, thermal, gravitational potential
2. It heat up
3. It decreases
4. Someone walking, a moving car, a football or anything that's moving
5. It increases
6. A lightbulb, the sun
7. It is conserved or it stays the same
8. Sankey
9. Spreads out wastefully
10. Electric lamp, TV, toaster, electric kettle, anything that plugs in