

Physics PPE Revision tasks

Task 2 - Energy resources & Energy transfer by heating

Resources

AQA Specification (available online):

6.1.1.3 Energy changes in systems

6.1.1.4 Power

6.1.3 National and global energy resources

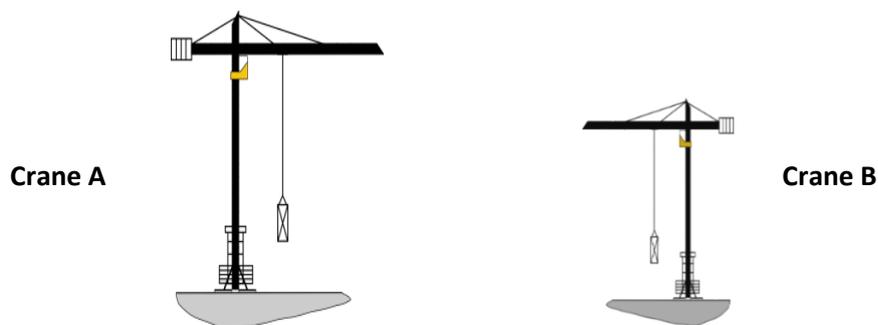
Collins Revision Guide

BBC Bitesize - <https://www.bbc.com/bitesize/topics/z89ddxs>

Energy changes in systems: Specific Heat Capacity and Power

1. The specific heat capacity of a substance is.....
 - A. the ability of a 1 kg object to store transferred energy
 - B. the total amount of stored energy in an object
 - C. the energy needed to raise the temperature of 1 kg of a substance by 1 °C.
2. When a bowl of water and a stone are left in hot sunshine, the stone feels much hotter than the water. Which one has the highest specific heat capacity? Explain your answer.
3. Give two alternative units of power?
4. A blowtorch burns butane gas to heat metal pipes.
 - a. Describe the energy transfers which occur as it is used.
_____energy is transferred into
_____energy usefully and
_____energy is wasted.
 - a. Explain how some of the transferred energy is wasted.
 - b. The blowtorch transfers 2 kJ of energy in 4 mins. Work out the power of the blowtorch?

5. Two cranes are lifting the same load of 120 kg to a height of 15 m.

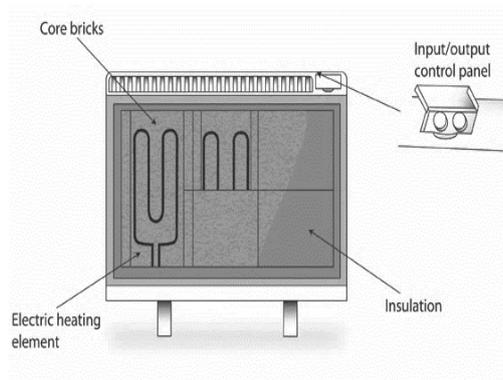


Crane A takes 30 s to lift the load. Crane B lifts the same load in 9 s.
Calculate the difference in power of the two cranes.

A. Storage heaters contain bricks which warm up and store heat energy.

The bricks in the heater have a mass of 40 kg and are heated from 18 °C to 40 °C.

If the specific heat capacity of the brick material is 850 J/kg°C, calculate the change in thermal energy during heating.



Change in thermal energy = Mass x Specific Heat Capacity x Temperature Change

$$\Delta E = m \times c \times \Delta\theta$$

National and Global Energy resources

1. What is a fossil fuel?
2. Copy and complete the table below by ticking the correct box for each energy source.

Energy source	Renewable	Non-renewable
Bio-fuels		
Oil		
Nuclear		
Hydro-electricity		
Wind turbines		
Coal		
Solar power		
Wave energy		
Natural gas		

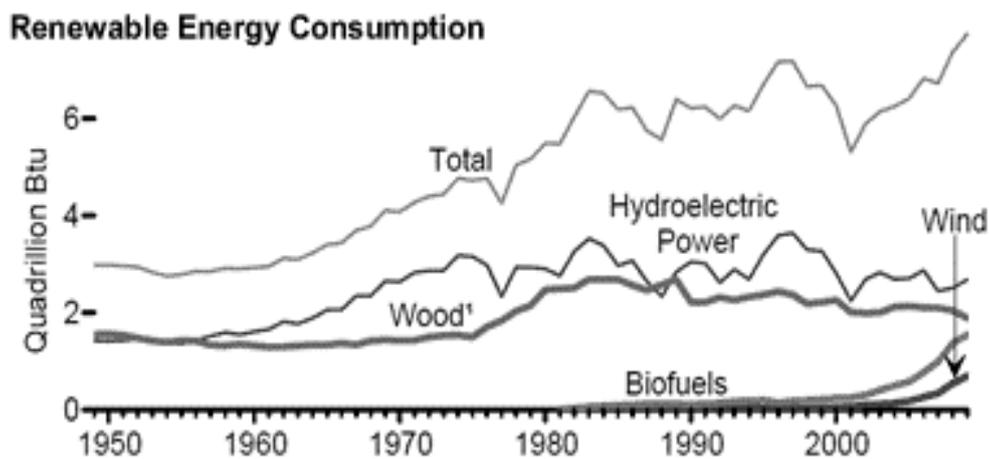
2. What is a renewable energy source?
3. Why are fossil fuels considered to be a more reliable energy resource than renewable energy resources?

4. Despite a large investment by the UK government in wind power, the amount of fossil fuel used has not seen a decline. Give a possible explanation for this.

6. The UK government is committed to investing in a "blend" of energy supply types to provide the UK's energy needs for the next 100 years.

Give an advantage of this rather than using just coal.

7. The graph shows the world use of renewable energies over the past sixty years.



a. Why has the use of wood increased very little over this time?

b. A lot of money has been invested in wind turbines. Why does this energy source not produce as much as any other renewable resource?

8. Copy and complete the table to give **energy sources** that could be used in each situation.

Energy use	Energy source 1	Energy source 2
Running a car		
Producing electricity		
Heating the home		
Powering a train		

- Describe how human activities have contributed to the greenhouse effect?
- Explain how burning coal in power stations contributes to global warming.
- Describe **two** problems associated with the storage of waste from nuclear power stations.
- State **two** reasons why people might object to having a wind farm built close to their homes.