



Energy

What is energy?

1 How do scientists define **energy**?

Forms of energy

2 What kind of energy is stored in:

- a) links between atoms in a molecule _____
- b) an object held above your head _____
- c) elastic materials? _____

3 Clare stands at the side of the swimming baths ready to run onto the diving board.


- a) What stored energy is in her body? _____
Clare runs to the end of the diving board and jumps up.
- b) At the top of her jump what extra stored energy does she possess?

Clare lands on the end of the diving board and bends it down.

- c) What stored energy does the diving board have now?

The board springs Clare into the air.

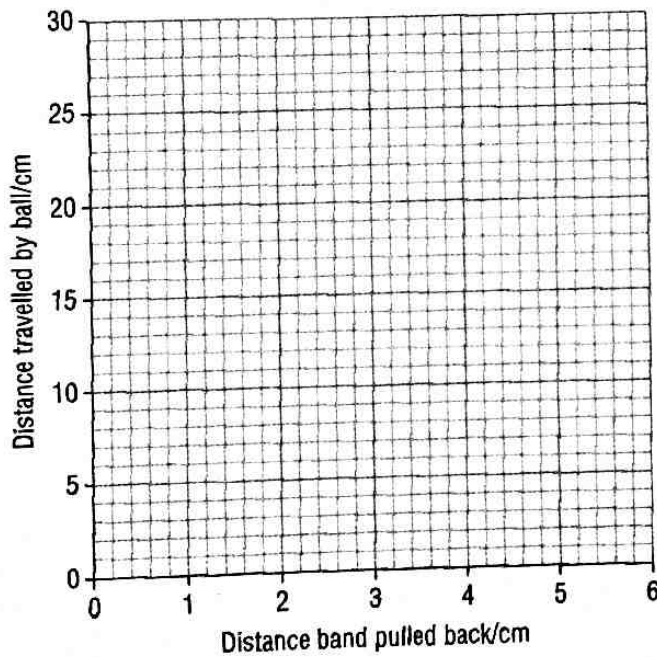
- d) When does Clare have maximum gravitational potential energy?

- 4  Fayola has made a catapult out of an elastic band. She has investigated the stored energy in it in the following way. She placed a cotton wool ball against the band, pulled back the elastic band 1 cm then let go and measured the distance the ball travelled. She repeated this process by pulling back the band to different distances and recorded her results.

Here is the table of data from her investigation.

Distance band pulled back/cm	Distance ball travelled/cm
1	2
2	4
3	14
4	17
5	29
6	0

- a) Present the data in the table as a line graph on the grid below.



- b) What pattern does the graph seem to show between the distance pulled back and the distance the ball travelled?



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c) What pattern does the graph seem to show between the amount of stored energy in the band and the distance the ball travelled? Explain your answer.

d) Comment on the accuracy of Fayola's results. _____

e) How could Fayola make sure the results show the pattern they seem to show?

f) What do you think happened when the elastic band was stretched to 6 cm?

5 How can you tell if something has kinetic energy? _____

6 Through which states of matter can sound energy pass?

7 What is the difference between electrical energy and electromagnetic energy?

Electrical energy _____

Electromagnetic energy _____

8 What kind of energy do particles in all substances such as wood, water and air have?

Energy changes

9 What main energy change takes place when sunlight is used to make food in a leaf?

10 What are the two forms of wasted energy that are released as a motorcycle moves along a horizontal road? Tick (✓) two boxes.

heat sound

light gravitational potential energy

Fuels

11 Here are some mixed up facts about the formation of a fossil fuel.

A Pressure squeezed out the water and heated the peat causing a change.

B Peat formed and was buried by rocks.

C Plants make food from sunlight.

D The time line begins about 275 million years ago.


E Dead swamp plants did not decompose.

a) Write down the letter of each statement in the order in which they occurred.

b) Which fossil fuel formed by this process? _____

c) Name **two** other fossil fuels. _____

d) From what did these fuels form? _____

 12 Han wants to compare the heat produced by two fuels. He sets up two barbecues. In one he places charcoal and in the other he places briquettes. He places water and a thermometer in two pans and places them on the barbecues then lights the fuels and measures the temperature of the water every 5 minutes for half an hour.

a) What must Han do to make the test fair?

Han recorded his results in a table.

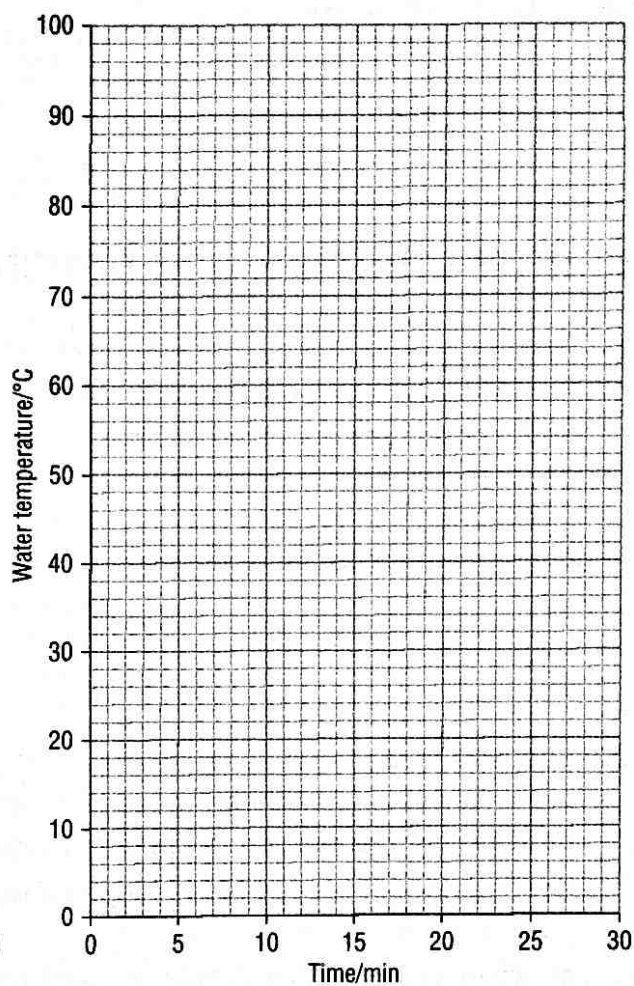
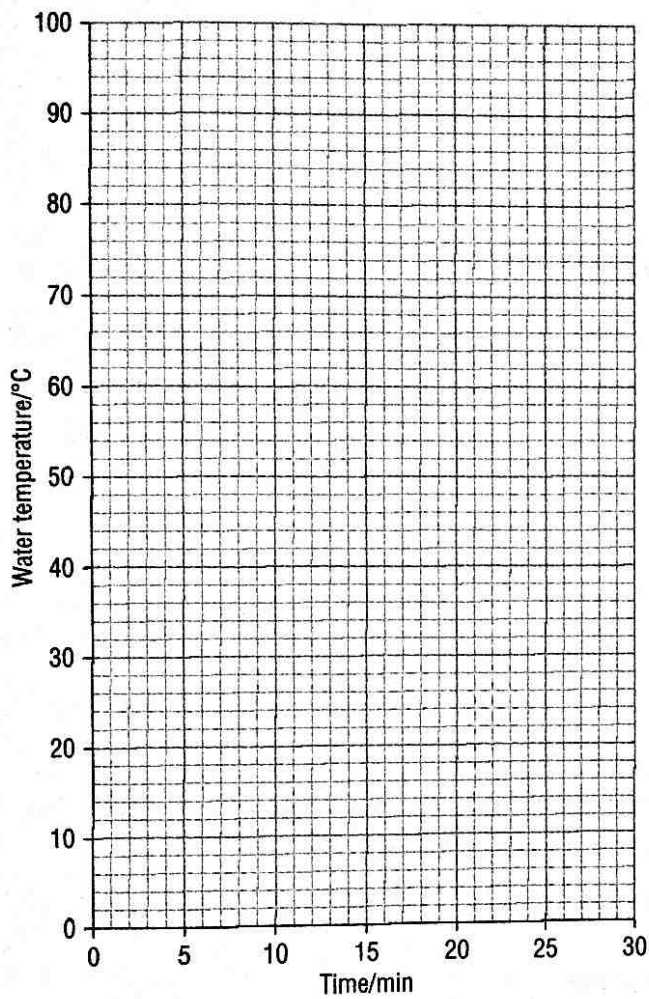
Time/min	Temperature of water heated by charcoal/°C	Temperature of water heated by briquettes/°C
0	30	30
5	70	40
10	92	60
15	99	90
20	80	99
25	70	92
30	50	90

b) Present the data in the table as two graphs on the grid on the next page.

c) Describe how the temperature of the water changes with each fuel.

(i) Charcoal _____

(ii) Briquettes _____



d) Compare how the fuels release their energy.
