

1

Write down three examples of substances or objects that are stores of chemical energy.

1 any three from: food (or named types of food, such as fat, sugar, etc.), fuels (or named fuels, such as petrol, oil, wood, gas, etc.), cells/batteries, muscles, etc.

2

Explain how the galley in photo B could be said to be using solar power.

2 The humans moving the oars get their chemical energy from food. The chemical energy in animals/ meat came from the chemical energy stored in plants, which was transferred originally by light from the nuclear energy store in the sun.

The kinetic energy stored in the moving air (wind) is caused by convection currents, which arise because of the energy transferred by heat to the Earth from the nuclear energy store from the Sun.

3

Write down one factor that affects the amount of kinetic energy stored in an object.

3 one from: mass, speed

4

Explain how energy stored in coal originally came from the Sun.

4 Coal is made from the remains of plants. These plants originally got their energy from the Sun.

5

An archer uses a bow to shoot an arrow.

- a| How is energy stored just before she shoots?
- b| What happens to this energy as she shoots?

5 a as elastic potential (strain) energy in the bent bow

b It is transferred to the arrow, where it is stored as kinetic energy.

6

- a| Give two examples of objects or substances that store gravitational potential energy.
- b| Describe two factors that affect the amount of gravitational potential energy stored in an object.

6 a any two objects in raised positions: a box on a shelf, a diver on a diving board, water behind a dam, boulder at the top of a hill, etc.

b the height of the object and its mass (accept strength of gravitational field in place of one of these factors)

7

Write down three energy resources that are:

- a|renewable
- b|non-renewable.

7 a) wind, moving water (tides, waves, hydroelectricity), solar, wood (if grown sustainably), geothermal

b) fossil fuels (coal, oil, gas), nuclear fuel, wood (if not grown sustainably)

8

Early steam engines had efficiencies of only a few per cent.

- a| What energy store did steam engines use?
- b| Was most of this energy transferred as wasted or useful energy?
Explain your answer.
- c| Suggest two ways in which energy might have been wasted.

8 a energy stored in the chemicals in coal

b wasted – a low efficiency means that only a small amount of the total energy transferred was transferred to useful energy

c energy transferred to the engine or surroundings by heating; energy transferred to the surroundings by sound

9

A man pushes his daughter on a swing to make her start moving.

- a| Draw an energy transfer diagram (similar to diagram A) to show the energy transfers.
- b| Explain why the swing eventually stops moving after the man stops pushing it.

9 a store of nuclear energy in Sun → (transferred by light) energy stored in chemicals in plants → energy stored in man (some students may add an animal/meat stage before this) → (energy transferred by forces) energy stored in movement of child and swing

b As the swing moves, air resistance acts to slow it down. Some of the kinetic energy is transferred to the surroundings and ends up stored as thermal energy. There will also be friction between the moving and stationary parts of the swing.

