

Name: _____ Teacher: _____

Mark: _____ /46

Percentage: _____ %

SECTION A: MULTIPLE CHOICE

(5 marks)

Select the most correct answer for each question below.

1. Energy is measured using a unit called the:

- (a) Jale.
- (b) Kilogram.
- ☒ (c) Joule.
- (d) Jule.

2. Choose the **correct** answer: 2 Kj converts to:

- ☒ (a) 2000 J.
- (b) 200 J.
- (c) 0.2 J.
- (d) 1000 J.

3. Petrol, kerosene and oil are all types of fuel. Choose which type of energy these fuels possess.

- (a) Nuclear energy.
- (b) Gravitational potential energy.
- ☒ (c) Chemical potential energy.
- (d) Heat energy.

4. Choose the **incorrect** answer regarding photosynthesis.

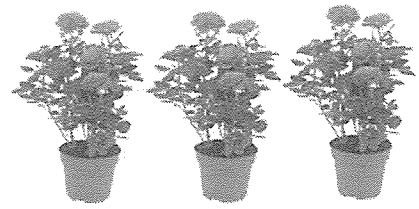
- (a) Photosynthesis allows plants to make their own food.
- (b) Photosynthesis is the process where plants convert sunlight into chemical energy.
- ☒ (c) Photosynthesis is the process where plants convert sunlight into electrical energy.
- (d) Photosynthesis allows plants to use the heat from the sun to make their own food.

5. Finda accidentally drops a piece of cake on the floor. Select the most likely sequence of energy transformations that occur.

- (a) Heat energy → gravitational potential energy → kinetic energy → sound energy
- ☒ (b) Gravitational potential energy → kinetic energy → sound energy → heat energy
- (c) Kinetic energy → gravitational potential energy → heat energy → sound energy
- (d) Sound energy → kinetic energy → heat energy → gravitational potential energy

ANSWER KEY

1. Experiment: three rose bushes were given fertiliser and another three rose bushes were not given fertiliser. After three weeks the height of all the rose bushes were measured.



a) State the dependent variable: Height of rose bush (1 mark)

b) State the independent variable: fertiliser or no fertiliser (1 mark)

c) List two controlled variables that should stay the same throughout the experiment). (2 marks)

Type of soil, type of rose bush, period of
time (3 weeks), amount of water given (ANY 2)
environment

d) Write a hypothesis for the experiment. (2 marks)

If a rose bush is given fertiliser then
it will grow quicker than a rose bush
not given fertiliser. (1)

2. Write definitions for the terms below.

(4 marks)

Potential energy: Energy that is stored. (1) (1)

Kinetic energy: The energy of movement. (1) (1)

3. Fill in the missing words.

(2 marks)

Energy makes things happen (0.5).

You can observe (0.5) (watch) what energy does.

You cannot see (0.5) energy or weigh it.

Energy is needed to move or heat something, to make a noise, or to change an object's shape (0.5).

4. Identify the main **type** of energy that each of the following situations have.

(3.5 marks)

a) Seatbelt buckle that has been in the sun all day: heat energy (0.5)

b) Shopping trolley rolling across the floor: Kinetic energy (0.5)

c) Lawnmower filled up with petrol: Chemical energy (0.5)

d) Bird resting in its nest on a tree branch: gravitational potential energy (0.5)

e) A child on a swing at its highest point: elastic potential energy OR gravitational potential energy (0.5)

f) A nuclear power plant: nuclear energy (0.5)

g) A child sitting at the top of a slide: gravitational potential energy (0.5)

5. Refer to the law of conservation of energy and **circle** whether the following statements are true or false.

(1.5 marks)

a) If energy is wasted, then it is lost altogether.

True

False

b) If energy is lost from one object, then it will be gained by another.

True

False

c) The total amount of energy in the universe is always changing.

True

False

6. List four types of stored energy.

(2 marks)

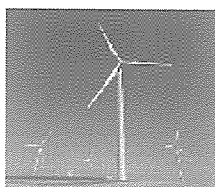
chemical potential energy (0.5) nuclear energy (0.5)

Elastic potential energy (0.5)



Gravitational potential energy (0.5)

7. These images all show types of renewable energy.

(1 mark)


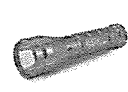


8. Fill in the table below. You can draw and label a diagram for the example or write an example. (4 marks)

Term	Definition	Diagram/example
Energy transfer	Energy being moved from one object to another (1)	kinetic energy transferred from boy to ball 
Energy transformation	Energy changed from one type of energy into another type of energy (1)	nuclear energy → heat + light energy 

9. Fill in the table below.

(3 marks)

Example	Initial energy (starting energy)	Useful energy produced (energy you want to use)	Wasted energy (energy you don't need)
Using a food Blender 	electrical energy (0.5)	Kinetic energy (0.5)	sound energy (0.5) heat energy
Using a torch 	Chemical potential energy (0.5)	light energy (0.5)	heat energy (0.5)

10. You ride a skateboard down the street.

(2 marks)

a) Identify the source of energy input for this activity.

chemical potential energy (0.5)

b) Identify three types of energy that are produced.

kinetic energy, sound energy, heat energy
(0.5) (0.5) (0.5)

11. Write the term next to its matching definition below.

(5 marks)

~~Sound energy, photosynthesis, chemical potential energy, heat energy, energy, elastic potential energy, light energy, electrical energy, nuclear energy, gravitational potential energy~~

a) The ability to make a change happen.

Energy (0.5)

b) The energy stored inside the small particles that make up all matter.

Nuclear energy (0.5)

c) The energy stored in substances.

Chemical potential energy (0.5)

d) Energy that travels as vibrating waves.

Sound energy (0.5)

e) The energy stored in a stretched or squashed spring.

Elastic potential energy (0.5)

f) The total kinetic energy the particles have in a substance.

Heat energy (0.5)

g) Energy that causes charged particles to move.

Electrical energy (0.5)

h) Visible energy that is produced by the Sun.

Light energy (0.5)

i) The energy stored in an object when it is above the ground.

Gravitational potential energy (0.5)

j) Process where green plants convert light energy into chemical energy.

photosynthesis

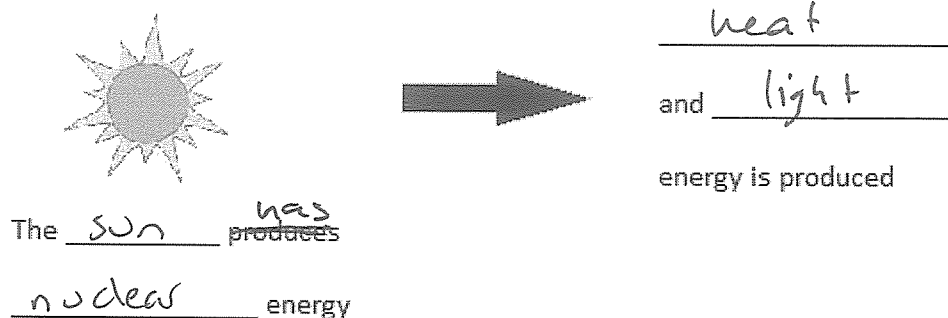
12. Draw an energy flow diagram to show the transformation of energy that occurs when wood burns in a fire. (You do not need to draw pictures).

(2 marks)

chemical energy (0.5) → heat energy (0.5)
+ sound energy (0.5)
+ light energy (0.5)

13. Fill in the missing blanks.

(2 marks)



14. An iPod dock is supplied with 2000 J of electrical energy. Of this, 900 J is converted into heat energy, 300 J is converted into kinetic energy of the sound system and the remaining energy is converted into sound.

a) Calculate the number of joules of sound energy produced (show working out)

(1 mark)

$$\text{sound energy produced} = 2000 - 1200 = 800 \text{ J}$$

(0.5) (0.5)

15. Problem: a kitchen blender uses 350J of electrical energy. Of this electrical energy it converted: 40J into sound energy, 110J into heat energy and 200J into kinetic energy.

(2 marks)

Calculate the percentage energy efficiency of the blender given that the useful energy output is kinetic energy (movement of the blades to chop and mix up the food).

Solution: add up all the output energy: 40 + 110 + 200 = 350 J

Energy efficiency = $\frac{\text{useful energy output}}{\text{energy input}} \times 100$

$$= \frac{200}{350} \times 100$$

$$= \underline{57} \%$$

The blender is 57 % efficient.