Year 8 Science

2021

Test:
Types of Energy

Name: Answers

Marks: 32

Materials Required:

- Blue/black ballpoint pen
- Pencil
- Ruler
- Eraser
- Calculator

Section 1 (10)	Section 2 (22)	Total (32)	Percentage

Section 1: Multiple Choice **[10 Marks]**

Circle the letter of the answer that best suits each of the following questions or statements.

1. Kinetic energy is also known as

a) Heat energy
b) Moving energy
c) Stored energy
d) Light energy

2. Sound energy is:

a) Energy stored in objects that are raised
b) Energy released by vibrating objects
c) Energy stored in the nuclei of atoms
d) Energy in moving objects

3. What sort of energy is stored in petrol?

a) Gravitation potential energy
b) Elastic potential energy
c) Chemical potential energy
d) Light energy

4. Four vehicles are travelling at the same speed. Which has the least kinetic energy?

a) A bike
b) A car
c) A bus
d) A road train

5. In which of the following can convection currents be set up?

a) Air

b) A Vacuum

c) Plastic

d) Aluminum

6. What method of heat energy transfer occurs mainly in solids?

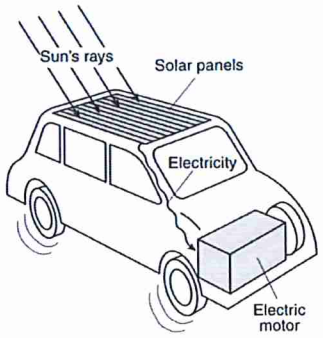
a) Conduction

b) Radiation

c) Convection

d) All of the above

7. What is the sequence of the energy transformation represented in the diagram on the right?



a) mechanical → chemical → solar

b) solar → electrical → mechanical

c) mechanical → electrical → solar

d) solar → chemical → electrical

8. An astronaut weighs less on the moon because the moon has

a) Weaker gravity

b) Thinner atmosphere

c) Colder temperature

d) Softer surface

9. Which of these methods of heat energy transfer does not involve particles?

a) Friction

b) Convection

c) Conduction

d) Radiation

10. An archer shoots an arrow from a bow. The useful energy change as he releases the arrow is

a) Elastic → kinetic

b) Kinetic → elastic

c) Chemical → gravitational

d) Gravitational → sound

End of Section 1

Section 2: Short Answers **[22 Marks]**

Answer all questions in the spaces provided. Use a blue or black pen, unless you have been asked to draw a diagram.

11. Petrol is burnt in a car engine to get the car moving; however, a lot of energy is wasted.

Name two forms of wasted energy produced in a car. (2 marks)

a) **Sound Energy** ✓

b) **Thermal/Heat energy** ✓

12. In 10 minutes, a power saw used 6050 J of electrical energy. It converted

- 1210J into kinetic energy
- 1520J into sound energy
- 3320J into heat energy

a) Identify the useful output energy from the saw. (1 mark)

1210J / Kinetic Energy ✓

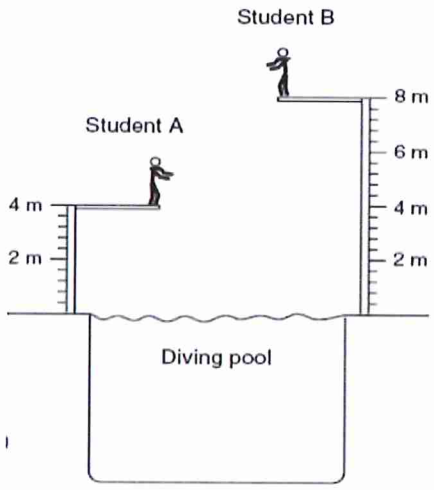
b) Calculate percentage energy efficiency of the saw using the following formula. Show your working: (2 marks)

$$\text{efficiency} = \frac{\text{useful energy}}{\text{total energy}} \times 100\%$$

$\frac{1210}{6050} \times 100$ ✓

Energy efficiency = 20%. ✓

13. The diagram shows two students ready to dive into a pool.



a) Explain which student has more gravitational potential energy? (2 marks)

Student B ✓
As they are higher so they have higher gravitational potential energy ✓

b) If both students were to jump off the diving boards, who would have more kinetic energy? Explain your answer. (2 marks)

Student B ✓
As they are starting with more potential energy ✓

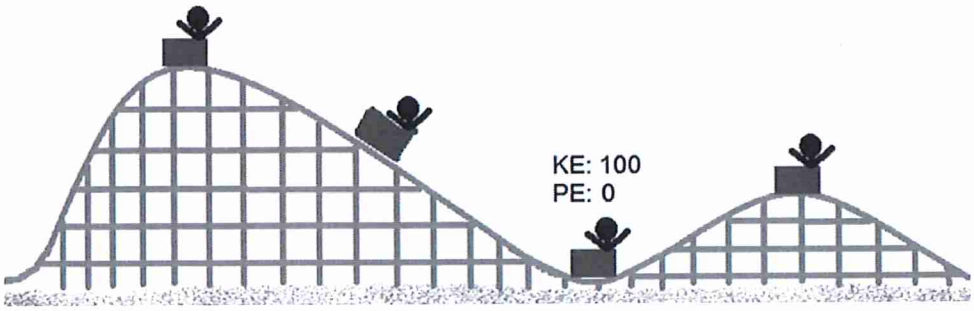
c) Name one thing that could be changed about this picture to increase Student A's potential energy. (1 mark)

Raise the diving board OR increase mass of student ✓

14. The diagram below shows a roller coaster cart at four positions as it moves along a track.

As it moves, the cart has varying levels of kinetic and potential energy.

However, throughout the entire ride, the total of potential energy plus kinetic energy is always equal. Explain why this is true. (2 marks)



Kinetic & potential energy are being converted back & forth thraghout the ride ✓

The total energy is neither created or destroyed, it only changes forms (transforms) ✓

15. Sam & Taylor conducted an experiment to determine which ball had the highest energy efficiency. They dropped each ball form the same height of 65cm, then recorded the return bounce height.

a) Calculate the average bounce height of each ball and then determine the bounce efficiency. (6 marks)

$$\text{efficiency} = \frac{\text{useful energy}}{\text{total energy}} \times 100\%$$

Type of ball	Bounce height 1 (cm)	Bounce height 2 (cm)	Bounce height 3 (cm)	Average bounce height (cm)	Bounce efficiency (%)
Tennis ball	17.5	18.0	20.5	18.666 ✓	28 ✓
Golf ball	52.5	61.0	56.0	56.5 ✓	86 ✓
Ping pong ball	50.0	46.0	52.0	49.333 ✓	75 ✓

b) Which sports ball had the highest bounce efficiency according to the test results? (1 mark)

Golf ball w/ 86%. ✓

16. A person touches a large chunk of ice with their hand and remarks, "This is making me cold."

Explain: what type of heat energy transfer is occurring, how that heat energy transfer works and where the transfer of energy has moved to and from. (3 marks)

- Conduction ✓
- conduction occurs through the vibration of particles. The particles with higher energy knock the lower energy particles, transferring the heat. ✓
- The heat is transferred from the hand to the ice. ✓

End of Test