**8 SCIENCE 2014**

### PHYSICS TEST

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

**SECTION B: SHORT ANSWER (41 marks)**



**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: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)

**b)** State the independent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)

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

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

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**2.** Write definitions for the terms below. (4 marks)

Potential energy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Kinetic energy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**3.** Fill in the missing words. (2 marks)

Energy makes things \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

You can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (watch) what energy does.

You cannot \_\_\_\_\_\_\_\_\_\_\_ energy or weigh it.

Energy is needed to move or heat something, to make a noise, or to change an object’s \_\_\_\_\_\_\_\_\_\_\_\_.

**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: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Shopping trolley rolling across the floor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) Lawnmower filled up with petrol: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) Bird resting in its nest on a tree branch: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e) A child on a swing at its highest point: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f) A nuclear power plant: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

g) A child sitting at the top of a slide: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**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)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**7.** These images all show types of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy. (1 mark)

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**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**  **transformation** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |

**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) |
| [http://t0.gstatic.com/images?q=tbn:ANd9GcRTFmua5GnrJAUiAKcPI29uyoqumWp79xY24J6l5zUCid1tTOr_7Q](http://www.google.com.au/url?sa=i&rct=j&q=food+blender&source=images&cd=&cad=rja&uact=8&docid=Y9Dn4sCe7nqr1M&tbnid=FfwUGvrys0lJXM:&ved=0CAUQjRw&url=http://www.freepatentsonline.com/D537674.html&ei=T446U4u4HYPPkwXSvIHICg&psig=AFQjCNFYPr_WlOKBC3icVDR1JFRhtxxH8A&ust=1396432841790375)Using a food  Blender |  |  |  |
| [http://www.lumini.com.au/wp-content/uploads/2013/02/FZL2200.jpg](http://www.google.com.au/url?sa=i&rct=j&q=torch&source=images&cd=&cad=rja&uact=8&docid=yKKW75xWhuZF_M&tbnid=hJOjxvTjSNqabM:&ved=0CAUQjRw&url=http://www.lumini.com.au/shop/led-torch/&ei=jI46U7DUAcaolAWQ9IHIAQ&psig=AFQjCNGECFHN_4BNLYDTPPnGzli8a_7cuA&ust=1396432888519493)Using a torch |  |  |  |

**10.** You ride a skateboard down the street. (2 marks)

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

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Identify **three** types of energy that are produced.

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**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.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) The energy stored in substances.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) Energy that travels as vibrating waves.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

g) Energy that causes charged particles to move.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

h) Visible energy that is produced by the Sun.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

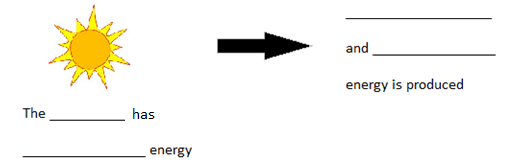
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**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)

**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)

**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: \_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_J

Energy efficiency = useful energy output x 100

energy input

= \_\_\_\_\_\_\_\_\_\_\_\_\_ x 100

= \_\_\_\_\_\_\_\_%

The blender is \_\_\_\_\_\_\_% efficient.