Kolbe Catholic College

Logo

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Test

Energy

2021

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Answer the following questions in the space provided.

1. An object that is moving from point A and point has:
   * Potential energy
   * Electrical energy
   * Chemical energy
   * Mechanical energy
   * Kinetic energy
2. Which of the following are types of potential energy?
   * Elastic energy
   * Gravitational energy
   * Sound energy
   * Kinetic energy
   * Chemical energy
3. Which of the following statements about energy are true?
   * Energy has many different forms, such as can be found in natural gas, sunlight, and water in mountain lakes
   * If you train hard, you will build up your energy
   * If something has energy it has to be moving, for example a train speeding along
   * Pushes, pulls and twists are all forms of energy
4. Which of the following are examples of objects increasing in energy? (You may choose more than one)
   * A leaf: when it is photosynthesizing
   * A car engine: while it is cooling down after a long drive
   * A ball: picking up speed as it rolls down a hill
   * A lizard: being carried to the top of a tree by a bird that has caught it
   * A rubber ball: when it’s being squashed
5. The scientific unit of energy is the:
   * Joule (J)
   * Ampere (A)
   * Volt (V)
   * Watt (W)
   * Kilowatt hour (kWh)
6. Which of the following are examples of things with a form of kinetic energy, using the descriptions given? (You may choose more than one)
   * Atoms in a red hot iron bar
   * A car spring, compressed when the car is fully loaded
   * A piece of firewood
   * A turbine in operation at a hydro-electric power plant
   * X-rays radiating from an X-ray machine
7. ‘A book on top of a wardrobe has more energy than a marble rolling slowly across the floor.’

Discuss this statement. Could it be true? Does it even make sense? Explain.

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A picture containing text, different, tool

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1. Which of the devices pictured above carries out this energy transformation?

Light 🡪 electricity

* Bunsen burner
* Wind turbine
* Torch
* Solar panel

1. What is the *main* energy transformation carried out by a Bunsen burner, when it is being used in an experiment?

* Chemical 🡪heat
* Kinetic 🡪 heat
* Chemical 🡪 light
* Elastic 🡪 kinetic

1. When you place soup in a saucepan over a gas flame, the lid heats up even though the flame isn’t touching it.

Which is the best explanation?

* Chemical potential energy in the meal lid is being transformed into heat
* The heat energy of the flame is being transferred through the saucepan to the lid
* The heated saucepan is transforming heat into the lid
* Heat energy from the flame is transformed into chemical energy in the soup, which is then transformed back into heat in the lid

1. A girl is standing on her skateboard, rolling down a hill.

A picture containing graphical user interface

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Which flow chart, above, most accurately represents the energy transformations?

* A
* B
* C
* D

1. What energy transformations occur in a hydro-electric power station?

A picture containing text, tree, outdoor

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* Where and/or what equipment is involved in each transformation?
* Do you think all of the original energy is transformed into the final form? Explain.

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1. Electric cars run with efficiencies of around 60%. This means that: (remember, there may be more than one correct answer)
   * On average, electric cars operate 60% of what they are capable of doing
   * About 60% of electrical energy delivered to the cars is wasted
   * About 40% of the electrical energy delivered to the cars is transformed into forms of energy we don’t want
   * About 60% of the electrical energy delivered to the cars is transformed into kinetic energy
2. If 100 joules of electrical energy is supplied to an LED downlight but only 47 joules of light is emitted, the energy efficiency of the light is:
   * 2.13
   * 47%
   * 53%
   * 147 J
   * 4700
3. A netball is dropped onto a flat surface from a height of 2 m and rebounds to 1.3 m.
   * What is the ball’s rebound efficiency? *(Show your working)*
   * Why doesn’t the ball rebound to the height it was dropped from?

*Note: Your answer must include the words transform or transformation*

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1. Draw lines between each term and its definition.

|  |  |
| --- | --- |
| Aim | A prediction of the result |
|  |  |
| Hypothesis | The factor in the experimental set up you will change |
| Independent variable | The goal of an experiment |
| Dependent variable | The factor you will keep the same for the whole experiment |
|  |  |
| Controlled variable | The factor you will measure to see how it changes |

1. Jeff’s group carried out an experiment to measure the maximum voltage produced with different numbers of blades on a small wind turbine. He graphed the results as shown below.

Chart, bar chart

Description automatically generated

From this graph, what would be the best number of blades for that wind turbine in those conditions?

* + 2
  + 3
  + 4
  + 6
  + 12

1. Draw a Sankey diagram to represent energy transformant that occur when a solar panel charges a battery.

*Hint: Have you noticed that the charger and phone warm up when a phone is charged?*

*Note: You don’t need to label the diagram with percentage values, but as much as possible, try to get your arrows about the right size.*