Energy Transformation Worksheet Answer Key PDF

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Part 1: Building a Foundation

Which of the following is an example of kinetic energy?

undefined. A) A compressed spring

undefined. B) A moving car ✓

undefined. C) A charged battery

undefined. D) A piece of coal

Kinetic energy is the energy of motion, so a moving car is an example.

Which of the following are forms of potential energy? (Select all that apply)

undefined. A) Gravitational energy ✓

undefined. B) Chemical energy ✓

undefined. C) Thermal energy

undefined. D) Elastic energy ✓

Forms of potential energy include gravitational, chemical, and elastic energy.

Define energy transformation and provide an example of a simple energy transformation process.

Energy transformation is the process of changing energy from one form to another, such as from chemical energy in food to kinetic energy in movement.

List two examples of devices that transform electrical energy into another form of energy.

1. Example 1

Toaster

2. Example 2

Light bulb

Examples include a toaster (electrical to thermal) and a light bulb (electrical to light).

Part 2: Understanding and Interpretation

In the process of photosynthesis, which type of energy is transformed into chemical energy?

undefined. A) Thermal energy
undefined. B) Electrical energy
undefined. C) Light energy ✓
undefined. D) Kinetic energy

Light energy is transformed into chemical energy during photosynthesis.

Which of the following statements about the law of conservation of energy are true? (Select all that apply)

undefined. A) Energy can be created or destroyed.
undefined. B) Energy can only be transformed from one form to another. ✓
undefined. C) The total energy in a closed system remains constant. ✓
undefined. D) Energy transformations are always 100% efficient.

True statements include that energy can only be transformed and the total energy in a closed system remains constant.

Explain why energy efficiency is important in energy transformations and provide an example of an inefficient energy transformation.

Energy efficiency is important to minimize waste and maximize output; an example of inefficiency is a traditional incandescent light bulb.

Part 3: Application and Analysis

Which energy transformation occurs in a wind turbine?

undefined. A) Chemical to electrical

undefined. B) Kinetic to electrical ✓

undefined. C) Thermal to mechanical

undefined. D) Nuclear to thermal

A wind turbine transforms kinetic energy from wind into electrical energy.

Identify the energy transformations involved when using a battery-powered flashlight. (Select all that apply)

undefined. A) Chemical to electrical ✓

undefined. B) Electrical to light ✓

undefined. C) Electrical to thermal

undefined. D) Chemical to thermal

The transformations include chemical to electrical and electrical to light.

Describe how a hydroelectric power plant transforms energy and identify the forms of energy involved in the process.

A hydroelectric power plant transforms kinetic energy from flowing water into electrical energy.

Which of the following best describes the energy transformation in a combustion engine?

undefined. A) Electrical to kinetic

undefined. B) Chemical to kinetic ✓

undefined. C) Thermal to electrical

undefined. D) Nuclear to thermal

A combustion engine transforms chemical energy from fuel into kinetic energy for movement.

Analyze the following scenarios and identify which involve energy loss as heat. (Select all that apply)

undefined. A) A light bulb lighting up ✓

undefined. B) A car engine running ✓

undefined. C) A solar panel generating electricity

undefined. D) A pendulum swinging

Energy loss as heat occurs in a light bulb and a car engine running.

Part 4: Evaluation and Creation

Which energy transformation process would be most sustainable for a small island community with abundant sunlight?

undefined. A) Coal-fired power generation

undefined. B) Nuclear power generation

undefined. C) Solar power generation ✓

undefined. D) Diesel generators

Solar power generation would be the most sustainable option for a small island community with abundant sunlight.

Evaluate the following energy sources based on their environmental impact and sustainability. (Select all that apply)

undefined. A) Wind energy ✓

undefined. B) Natural gas

undefined. C) Solar energy ✓

undefined. D) Oil

Wind energy and solar energy are generally more sustainable and have a lower environmental impact compared to natural gas and oil.

Propose a plan for a city to transition from fossil fuels to renewable energy sources. Consider the types of energy transformations involved and the potential challenges.

A plan could include increasing solar and wind energy use, improving energy efficiency, and addressing challenges like funding and infrastructure.

Identify two innovative technologies that improve energy efficiency and briefly describe how they achieve this.

1. Example 1

LED lighting

2. Example 2

Smart thermostats

Examples include LED lighting (which uses less energy than traditional bulbs) and smart thermostats (which optimize heating and cooling).