

Integrated Science

Introduction to Vyasa Purnima Term

Instructions:

1. *This handout should be printed and pasted into your books (if possible) or it should be written.*
2. *All the questions MUST be answered.*
3. *Please be reminded that all outstanding work will be dued immediately on the first day of school.*

What is Energy?

The simplest definition of energy is "the ability to do work". Energy is how things change and move. It's everywhere around us and takes all sorts of forms. It takes energy to cook food, to drive to school, and to jump in the air.

Different forms of Energy

Energy can take a number of different forms. Here are some examples:

- **Chemical** - Chemical energy comes from atoms and molecules and how they interact.
- **Electrical** - Electrical energy is generated by the movement of electrons.
- **Gravitational** - Large objects such as the Earth and the Sun create gravity and gravitational energy.
- **Heat** - Heat energy is also called thermal energy. It comes from molecules of different temperatures interacting.
- **Light** - Light is called radiant energy. The Earth gets a lot of its energy from the light of the Sun.
- **Motion** - Anything that is moving has energy. This is also called kinetic energy.
- **Nuclear** - Huge amounts of nuclear energy can be generated by splitting atoms.
- **Potential** - Potential energy is energy that is stored. One example of this is a spring that is pressed all the way down. Another example is a book sitting high on a shelf.

Units of Measure for Energy

In physics, the standard unit of measure for energy is the joule which is abbreviated as 'J'.

Law of Conservation of Energy

This law states that energy is never created or destroyed, it is only changed from one state to another. One example is the chemical energy in food that we turn into kinetic energy when we move.

Renewable and Non-renewable

As humans we use a lot of energy to drive our cars, heat and cool our houses, watch TV, and more. This energy comes from a variety of places and in a number of forms. Conservationists classify the energy we use into two types: renewable and non-renewable. Non-renewable energy uses up resources that we cannot recreate. Some examples of this are gas to run our car and coal burned in power plants. Once they are used, they are gone forever. A renewable energy source is one that can be replenished. Examples of this include hydropower from turbines in a dam, wind power from windmills, and solar power from the sun. The more renewable power we use the better for our planet and for future generations as they won't run out of resources someday.

Fun Facts about Energy

- In 2008 about 7% of the energy used in the United States was from renewable sources.
- A modern windmill or turbine can generate enough electricity to power around 300 homes.
- People have used waterpower to grind grain for over 2,000 years.
- Geothermal power uses energy from geysers, hot springs, and volcanoes.
- The entire world could be powered for a year from the energy from the sun that falls on the Earth's surface in one hour. We just need to figure out how to harness it!

Answer the following questions.

1. What type of energy is stored energy?

- a. Kinetic energy
- b. Electrical energy
- c. Potential energy
- d. Nuclear energy

2. What type of energy is generated by the movement of electrons?

- a. Kinetic energy
- b. Electrical energy
- c. Potential energy
- d. Nuclear energy

3. What type of energy do we get from the rays of the sun?

- a. Kinetic energy
- c. Potential energy
- d. Nuclear energy
- e. Radiant energy

4. What type of energy can be generated by splitting atoms?

- a. Kinetic energy
- b. Electrical energy
- c. Potential energy
- d. Nuclear energy

5. What type of energy comes from movement or motion?

- a. Kinetic energy
- b. Electrical energy
- c. Potential energy
- e. Radiant energy

6. What is the standard unit of measurement for energy in physics?

- a. Ampere
- b. Volt
- c. Newton
- d. Joule

7. The 'Law of _____ of Energy' says that energy is never created or destroyed, it just changes states.

- a. Induction
- b. Reduction
- c. Conservation
- d. Production

8. What type of energy source will eventually run out?

- a. Renewable
- b. Nonrenewable
- c. All of the above
- d. None of the above

9. Which of the following is a renewable energy source?

- a. Solar power
- b. Wind power
- c. Hydropower
- d. All of the above

10. What type of energy source is generated by hot springs and geysers?

- a. Solar power
- b. Wind power
- c. Hydropower
- e. Geothermal power

11. State on difference between the following:

- I. Renewable and Non-renewable energy
- II. Kinetic and Potential energy

12. State and define three (3) types of renewable energy and give one example of each type.

13. State and define three (3) types of non- renewable energy and give one example of each type.

14. State the 'Law of Conservation of Energy' and give two examples.

15. State two (2) units used to measure energy apart from Joules (J).