LESSON 25 Energy Conversions: Science and the Use of Energy

Grade Level: 9-10

1. Grades 9-10

2. Overview Ability to do work is usually defined as energy. How then do we get energy? Here, a whole range of different kinds of energy are considered. Biological, chemical and physical forms of energy play a very important part in our every day living. There is need to consider very broadly both the sources and methods of conversion of energy. The sun still remains as our main source of energy.

3. Purpose Energy as a requirement for daily living should be seen holistically. The purpose therefore of this lesson is to treat in an integrated way, energy in our environment. Three aspects of energy are considered-generation, application and conservation.

4. Objectives Students will be able to:

i. Discuss the concept of energy
ii. Identify the sources of energy
iii. Explain how energy is converted for use.
iv. Discuss how energy is managed and conserved.

5. Resources/materials

- Appliances used in the home- torch, electric kettle, pressing iron, electric fan,
- Gas cookers, air conditioners, refrigerators, lawn mower.

The teacher would have to rely on the availability and use of the above appliances.

6. Activities and Procedures This would be the third time that energy has been referred to in these series of lessons. The concept of energy in its holistic form is emphasised. Energy, the capacity to do work, is seen from both the biological and mechanical stand points. From the foods we eat, human beings derive energy. That is why in the discussion of balanced diet, energy giving food was emphasised. **The seven forms of energy-Chemical, Potential, Kinetic, Electrical, Radiant, Heat and Sound energy could then be discussed**.

Appliances in our homes provide us with useful energy. But it is important while discussing the sources of energy, remind the students that the sun is indeed the ultimate source of energy. Plants need the sun's energy to manufacture their food.

Animals feed on plants for energy. Human beings feed on animals. The sun also provides us with both heat and light energy. Simple electric cells and generators are sources of electrical energy. We know. Wind and water while in fast motion are also sources of energy. The teacher should ask the students to make a comprehensive list of all the sources of energy that they know of. Energy conversion is an important aspect of this lesson. There are different forms of conversion of energy:

- Electrical energy to light energy
- Electrical energy to heat energy
- Potential energy to kinetic energy
- Light energy to heat energy

The teacher should encourage the students to collect more examples of energy conversions.

The management of energy is a vital issue to discuss with the students. Much as we all need to use energy, there is also that need and responsibility to manage the energy properly. The electricity that is supplied to our homes has to be used so that it is not wasted. In many towns and villages in Africa, some of the energy needed for cooking comes from burning fire- wood. Care has to be taken so that all the wood in and around si not cut down just for cooking fuel. The teacher should here introduce conservation of both the source and use of energy. Energy from fuel used for driving our cars has to be used judiciously. In most of the cases where the source of energy is not easily replenished, care must be taken to conserve and use it.

7. Tying it all together As the world's population increases and attempts are made to raise standards of living, the demand for energy grows. Scientists are looking for alternative sources of energy. The introduction of nuclear energy has its problems and the risks seem to outweigh its usefulness. What is still important to bear in mind is judicious use of energy.

8. Assessment Teacher made tests should be used to find out how students have comprehended the concept of energy.

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10. References STAN (1998) **Nigerian Integrated Science Project. Book Two**. Ibadan: Heinemann Educational Books (Nigeria) Limited.

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