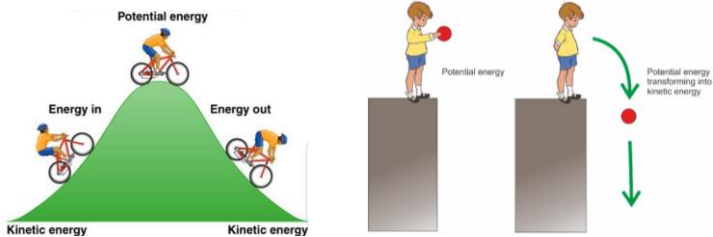


## SECOND TERM WEEKLY LESSON NOTES

## WEEK 8

<b>Date:</b> 1 <sup>st</sup> JULY, 2022	<b>DAY:</b>	<b>Subject:</b> Science
<b>Duration:</b>		<b>Strand:</b> Forces & Energy
<b>Class:</b> B7	<b>Class Size:</b>	<b>Sub Strand:</b> Energy
<b>Content Standard:</b> B7.4.1.1 Demonstrate an understanding of forms of energy and their daily applications		<b>Indicator:</b> B7.4.1.1.1 Identify the various forms of energy and show how they are related.
<b>Performance Indicator:</b> Learners can categorize different farming systems		<b>Lesson:</b> 1 of 2
<b>Core Competencies:</b> DL 5.3: DL 5.1:CC 8.2: CC 8.5: CI 5.2: CI 6.2:CI 5.4:		
<b>References:</b> Science Curriculum Pg. 26-27		
<b>Phase/Duration</b>	<b>Learners Activities</b>	<b>Resources</b>
<b>PHASE 1: STARTER</b>	Using questions and answers, review learners understanding in the previous lesson.  Share learning indicators and introduce the lesson.	
<b>PHASE 2: NEW LEARNING</b>	Brainstorm learners for the meaning of energy. <i>Energy is the ability or the capacity to do work. It is measured in joules (J).</i> <i>The following are some forms of energy:</i> i. Mechanical energy (potential and kinetic energy) ii. Chemical energy iii. Light energy iv. Sound energy v. Nuclear energy vi. Electrical energy vii. Heat energy viii. Thermal energy ix. Solar energy  Engage learners to demonstrate and show by diagrams how Potential Energy (PE) is related to Kinetic Energy (KE) ; (Mechanical Energy= PE+ KE).  <i>Mechanical Energy: It is the energy that a body has due to its position or its states of motion. There are two forms of mechanical energy: These are potential and kinetic energy. Mechanical energy = kinetic energy (KE.) + potential energy (PE.).</i>  <i>Potential and kinetic energy are two forms of energy that can be converted into each other. Potential energy can be converted to kinetic energy and vice versa.</i>	Solar panels, Torch light, cardboards, candle, etc

	<p>Potential energy is the stored energy in any object or system by virtue of its position or arrangement of parts. However, it isn't affected by the environment outside of the object or system, such as air or height.</p> <p>On the other hand, kinetic energy is the energy of an object or a system's particles in motion. Contrary to potential energy, the kinetic energy of an object is relative to other stationary and moving objects present in its immediate environment. For instance, the kinetic energy of the object will be higher if the object is placed at a greater height.</p> <p>Potential energy isn't transferrable and it depends on the height or distance and mass of the object. Kinetic energy can be transferred from one moving object to another (vibration and rotation) and is dependent on an object's speed or velocity and mass.</p> <p>Let's explain P.E and K.E with the help of an example. Imagine you have a hammer in your hand. When you raise the hammer higher, it'll have potential energy. But as you drop the hammer downwards to bang on a table's surface, it'll have kinetic energy.</p> <p>There are three interesting things you should note here.</p> <p>First, the raised hammer has more potential energy since it has the potential to go higher or lower. Second, when you hit the hammer on the table, the stored potential energy is converted to kinetic energy as the hammer is falling. (It's the falling hammer that has kinetic energy.) Third, as soon as the hammer hits the table, the energy changes. The stationary hammer then has stored energy in the form of potential energy.</p> <p>As this example demonstrates, energy is neither destroyed nor lost during the whole process – it's only altered from one form to another, proving the law of conservation of energy.</p> <p>When the book is at rest, it has potential energy. But when you accidentally knock it off the table, this potential energy will turn into kinetic energy while the book falls since it's in motion. However, as soon as the book hits the floor, this energy of motion will again convert to potential energy.</p> <p>Guide learners to discuss the difference between potential and kinetic energy.</p> <p><u>Assessment</u></p> <ol style="list-style-type: none"> <li>1. What is energy?</li> <li>2. How is potential energy related to kinetic energy.</li> <li>3. State three difference between potential energy and kinetic energy.</li> </ol>	
<p><b>PHASE 3: REFLECTION</b></p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

<b>Date:</b> 24 <sup>th</sup> JUNE, 2022	<b>DAY:</b>	<b>Subject:</b> Science
<b>Duration:</b>		<b>Strand:</b> Forces & Energy
<b>Class:</b> B7	<b>Class Size:</b>	<b>Sub Strand:</b> Energy
<b>Content Standard:</b> B7.4.1.1 Demonstrate an understanding of forms of energy and their daily applications	<b>Indicator:</b> B7.4.1.1.2 Explain daily applications of forms of energy.	<b>Lesson:</b> 2 of 2
<b>Performance Indicator:</b> Learners can categorize different farming systems		<b>Core Competencies:</b> DL 5.3: DL 5.1:CC 8.2: CC 8.5: CI 5.2: CI 6.2:CI 5.4:
<b>References:</b> Science Curriculum Pg. 26-27		

Phase/Duration	Learners Activities	Resources
<b>PHASE 1: STARTER</b>	<p>Using questions and answers, review learners understanding in the previous lesson.</p> <p>Share learning indicators and introduce the lesson.</p>	
<b>PHASE 2: NEW LEARNING</b>	<p>Discuss how forms of energy are used in daily life. Example: <i>Chemical energy: Chemical energy is energy stored in the bonds of chemical compounds (atoms and molecules). Chemical energy is released in a chemical reaction, often in the form of heat.</i></p> <p><i>Electrical Energy: Electrical energy is the energy carried by moving electrons in an electric conductor. Other forms of energy are also converted to electrical energy.</i></p> <p><i>Thermal energy: Thermal energy is the energy a substance or system has related to its temperature, that is, the energy of moving or vibrating molecules</i></p> <p>Guide learners to match forms of energy to appliances (gadgets) used daily at school, in the home and community.</p> <p>Explain factors that affect Potential and Kinetic energy in their application in daily life.</p> <p><u>Factors that affect Potential energy</u>  1. Objects of larger masses have greater potential energy than objects of smaller masses  2. The higher the acceleration due to gravity, the greater the potential energy and vice versa.  3. The higher the height of an object, the greater the potential energy and vice versa</p> <p><u>Factors that affect kinetic energy:</u>  1. The greater the mass of an object the greater the kinetic energy and vice versa.  2. The higher the velocity of the object, the greater the kinetic energy and vice versa</p> <p>Use mathematical expressions for both Potential energy (<math>PE = mgh</math>) and Kinetic energy (<math>KE = \frac{1}{2} mv^2</math>) and use the expressions to solve problems involving mechanical energy.</p>	Solar panels, Torch light, cardboards, candle, etc

	<p><i>Potential energy: Potential energy (PE) is calculated by using the formula mass (m) x acceleration due to gravity(g) x height (h) of the object.</i></p> <p><i>Kinetic energy: Kinetic energy is the energy that a body has by virtue of its motion. It is calculated by using the formula, (K.E) = 1/2 x mv<sup>2</sup>.</i></p> <p>1. A body of mass 14.0 kg is placed on an orange tree 17.0m above the ground. Calculate its potential energy with respect to the ground. [g = 10m/s<sup>2</sup>].</p> <p>Answers: Given that; mass of the of object, (m) = 14kg, height (h) of the tree = 17m acceleration due to gravity, g = 10m/s<sup>2</sup>          Potential energy ((P.E) = m x g x h          = 14kg x 10m/s<sup>2</sup> x 17m          = 2380J</p> <p>2.The potential energy of a body 5 m above the ground is 200 J. Calculate the mass of the body if g = 10 m/s<sup>2</sup>.</p> <p>ANSWER: Potential energy (P.E) = 200J height (h) = 5m          g= 10m/s<sup>2</sup> mass(m) =?          Mass(m) = P.E / g x h          = 200/ 10 x 5          = 200/ 50          = 4kg          The mass of the body = 4kg.</p> <p>3.The body of mass 5 kg has a potential energy of 400 J. Calculate the height of the body above the ground if g = 10 m/s<sup>2</sup></p> <p>Answers: Mass(m)= 5Kg, Potential energy ((P.E) = 400J,          g=10m/s<sup>2</sup> height (h) =? height (h) = P. E / m x g          h = 400J / 5 x 10          h = 400/ 50          h = 8m</p> <p>The height of the body above the ground is 8m.</p> <p><u>Assessment</u></p> <p>1.Three objects X, Y and Z with masses 30 kg, 55 kg and 27 kg respectively are placed on top of a building of height 35 m from the ground. State with reasons, which of the objects:</p> <ul style="list-style-type: none"> <li>• Has the least potential energy?</li> <li>• Has the greatest potential energy?</li> <li>• Will have the greatest kinetic energy when rolled to fall?</li> </ul>	
<p><b>PHASE 3: REFLECTION</b></p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	