

The Asian International School
Unit Backward Design
Physics, Intermediate, 2018-2019
UNIT 4: ENERGY, WORK AND FUELS

Stage 1 - Desired Results	
<p>Established Goal(s):</p> <p>In this unit students will be able to identify types of energy and develop an understanding of the characteristics of energy and the interactions between matter and energy by describing the usefulness of some forms of energy. Students will receive an opportunity to perform experiments and note down their results.</p>	
<p>Understanding(s):</p> <p><i>Students will understand ...</i></p> <ul style="list-style-type: none"> • Formation of coal, oil and natural gas • The disadvantages of using Fossil Fuels • Global Warming and its impact to the environment • The Effect of Acid Rain • Energy conversions • Law of conservation of energy • The importance of conserving energy and finding new energy sources 	<p>Essential Question(s):</p> <ul style="list-style-type: none"> • What are 'fuels'? • How do fuels release energy? • Why does burning fossil fuels cause problems? • What alternative energy sources can we use? • How can energy be transferred from one material to another? • What happens to a material when energy is transferred to it? • Explain why wind and wave power could not be relied on to provide a country's entire electricity supply • What energy conversion is happening when charcoal is used as the fuel for a barbecue? • Explain why some energy resources are described as 'renewable'. Why should we make more use of renewable, and what are their problems?
<p>Knowledge:</p> <p><i>Students will know ...</i></p> <ul style="list-style-type: none"> • The energy is release from fuels by a chemical reaction called combustion. • Making bonds in the new molecules releases lots of energy. • Most of our energy comes, directly or indirectly, from the Sun. • A renewable energy resource is replaced after it has been used. When a non-renewable resource is used, it is gone forever • Fossil fuels are major source of energy on earth, it comes in different form as well and they are about to be gone • There are other resources of energy which are 	<p>Skills:</p> <p><i>Student will be able to:</i></p> <ul style="list-style-type: none"> • Apply the principle of conservation of energy • Identify and describe energy resources • Make a plan for a world that does not rely on fossil fuels for most of its energy • Do a presentation on the advantages and disadvantages of using renewable energy resources • Do a research presentation on the different renewable energy sources in Vietnam • Create a project proposal to AIS about how the school can be nature friendly and energy saver

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renewable and nature friendly.

Stage 2 - Assessment Evidence

Performance Task(s):

To assess student progress made in this course, student work in the following activities will be clearly recorded and evaluated according to criteria, rubrics, and the teacher's discretion. Homework will be given 10% and all the others will be given 30% of student grades.

- Laboratory Activities
 - a. Potential and Kinetic Energy
 - b. Formation of Coal
- Group Task
 - a. Making a Poster (Advantages and Disadvantages of Using Fossil Fuels)
 - b. Making an ethanol fuel
 - c. Investigating energy from biological waste
 - d. Making Charts- Fossil Fuel to Electricity / Renewable and Non-renewable Energy
- Individual Task
 - a. Calculating work done and energy used to heat water
 - b. Concept Mapping- Common Fuels / Conserving Energy
 - c. Making Diagrams- Formation of Coal
 - d. Making a Table- Causes and Effect of Global Warming and Acid Rain

Other Evidence:

The following will also be observed, recorded, and considered for the final grade of students in each lesson activity

- Motivation
- Engagement
- Collaboration
- Communication pattern among peers and with the teacher
- Reactions
- Respect to others and different opinions
- Research: Impacts of Global Warming in Vietnam and other SEA countries
- Group Presentation
 - a. Role Play/Simulation/Demonstration: Formation of Coal/Gas/Oil
 - b. Research Work: Impact of Global Warming
- Project:
 - a. Conservation of energy model
- Reflective Thinking: Writing a Reflection (Global Warming Effects)
- Unit Questions
- Quiz
- Interactive Simulation
 - a. <https://phet.colorado.edu/en/simulation/legacy/energy-forms-and-changes>
 - b. <https://phet.colorado.edu/en/simulation/legacy/greenhouse>

Stage 3 - Learning Plan

Learning Activities:

In this course, students are involved in a variety of class activities to understand concepts of Physics in a deeper level. In doing so they will be able to relate and apply whatever they have learned to their day to day life, to use and apply scientific principles and to improve their research skills appropriate to their grade level. The following is a summary of lesson activities for the course.

1. Individual/pair/small group activity

Students will do **hands-on project** to have a vivid and lasting understanding of what they DO much more than

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what they only hear or see. They will also do **experiments in the laboratory** pertaining to the topic they have learned to have a better understanding of the concept. They will also be given **assignments** on a specific topic requiring them to search for the materials outside their textbook and present it on paper. These activities will enable them build a scientific attitude in their life.

2. Experimental Observation, Discussion and presentation:

Students in pair or in small groups will do experiments in the laboratory or do simulation related to that experiment. They will be given a worksheet based on their experiment. They will have to discuss the questions within their group. After a certain period of time, they will share their ideas with the class. This activity will boost student imagination, thinking skills, application of knowledge and creativity, as well as cooperation and collaboration with peers.

3. Critical Thinking Activities

Students are involved in more challenging discussions and activities at grade level that are related to higher-order thinking skills according to the revised Bloom's Taxonomy as below:

Applying

Students can apply their knowledge on any of the topics learned by doing **project work** based on it. They will have to present it before the whole class before the end of the school year.

Analyzing

Students will be given a problem based on real life situation and are asked to find out the scientific reason behind it.

Evaluating

Students will be given a worksheet. The teacher will show a video or the students will perform experimental simulations related to the topic. The students can answer the worksheet after watching the video or performing experimental simulations. After that they are asked to generalize their understanding.

Creating

Students can demonstrate their creativity by doing some kind of project work and presenting it before the whole class.

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UNIT 5: ELECTRICITY AND ELECTRICAL CIRCUITS

Stage 1 - Desired Results	
<p>Established Goal(s):</p> <p>In this unit students will demonstrate and explain the movement of electricity in closed and open circuits; construct and explain a simple electric circuit; demonstrate that electricity flowing in circuits can produce light, heat, sound, and magnetic effects. Students will receive an opportunity to perform experiments and note down their results.</p>	
<p>Understanding(s):</p> <p><i>Students will understand ...</i></p> <ul style="list-style-type: none"> • The causes static electricity • Electrostatic forces • Practical applications of static electricity • Definition of electric current, voltage and resistance • The need to use symbols to represent the parts of an electrical circuit • The proper way to connect ammeter and voltmeter in a circuit • The definition of series and parallel circuit • Some of the fundamental logic gates and its applications in real life situations 	<p>Essential Question(s):</p> <ul style="list-style-type: none"> • Here are some things you may have noticed: <ul style="list-style-type: none"> i. If you rub a comb through your hair, your hair is attracted to the comb. ii. After combing, your hair is light and fluffy – the individual hairs repel each other. <p>What do these observations tell you about the electric charges on your hair and on the comb?</p> <ul style="list-style-type: none"> • What causes static electricity? • What are the practical applications of electrostatics? • What happens in electrical circuits? • What is a truth table? • What is a relay? Name some devices where relay is used? • Describe the effect when the output of a NOT gate is connected to the input of another NOT gate? • Suggest a use for the combination of gates.
<p>Knowledge:</p> <p><i>Students will know ...</i></p> <ul style="list-style-type: none"> • When one object is rubbed against another, they may gain opposite electrostatic charges • Like charges repel whereas unlike charges attract • Objects gain an electrostatic charge when they gain or lose electrons • Electricity is a form of energy that results from 	<p>Skills:</p> <p><i>Student will be able to:</i></p> <ul style="list-style-type: none"> • Perform some basic experiments to find out about static electricity. • Investigate the forces between positive and negative electric charges • Use the process of induction to charge an object to test its charge. • Investigate some materials to discover which

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<p>the flow of charged particles</p> <ul style="list-style-type: none"> • Current is a flow of charge from positive to negative • Conventional current is the flow of positive charge • Logic gates are combined to give digital control circuits • Power is the rate at which energy is transferred (from place to place) or transformed (from one form to another) 	<p>are good conductors</p> <ul style="list-style-type: none"> • Connect voltmeter and ammeter correctly in a circuit. • Measure the current flowing in a simple circuit • Set up a circuit to measure and calculate resistance • Investigate factors affecting resistance of a circuit • Solve some problems involving logic gates • Design a decoration powered by batteries • Construct a series as well as parallel circuit so as to study the variations in current and voltage • Construct a quiz board • Determine the power of some electrical components • Investigate on resistive components like LDR, thermistor etc.
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Stage 2 - Assessment Evidence

<p>Performance Task(s):</p> <p>To assess student progress made in this course, student work in the following activities will be clearly recorded and evaluated according to criteria, rubrics, and the teacher’s discretion. Homework will be given 10% and all the others will be given 30% of student grades.</p> <ul style="list-style-type: none"> • Laboratory Activities <ul style="list-style-type: none"> a. Conductor or Insulator b. Measuring Current and Potential Difference • Group Tasks <ul style="list-style-type: none"> a. Simple Circuit Model b. Electrical Components Symbol- Chart c. How a Switch Works – Chart • Individual Tasks: 	<p>Other Evidence:</p> <p>The following will also be observed, recorded, and considered for the final grade of students in each lesson activity</p> <ul style="list-style-type: none"> • Motivation • Engagement • Collaboration • Communication pattern among peers and with the teacher • Reactions • Respect to others and different opinions • Research Presentations <ul style="list-style-type: none"> a. Safety Measures (Electrical Circuits/Shocks) • Demonstration: Wiring a Plug • Individual Tasks: <ul style="list-style-type: none"> a. Writing Reflections (Reflective Thinking) b. Home Survey- Appliances (Using mains or battery) c. Unit Questions • Quiz • Interactive Simulation a. https://phet.colorado.edu/en/simulation/circuit-
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<ul style="list-style-type: none"> a. Writing Truth Tables b. Calculating , current, resistance, electric current and electrical charge c. Illustrating circuit diagrams d. Interpreting tables and circuit diagrams • Project: <ul style="list-style-type: none"> a. Graphite circuit b. Simple and Parallel circuits 	<p>construction-kit-dc-virtual-lab</p> <p>b. https://phet.colorado.edu/en/simulation/legacy/electric-hockey</p>
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Stage 3 – Learning Plan

Learning Activities:

In this course, students are involved in a variety of class activities to understand concepts of Physics in a deeper level. In doing so they will be able to relate and apply whatever they have learned to their day to day life, to use and apply scientific principles and to improve their research skills appropriate to their grade level. The following is a summary of lesson activities for the course.

1. Individual/pair/small group activity

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2. Experimental Observation, Discussion and presentation:

Students in pair or in small groups will do experiments in the laboratory or do simulation related to that experiment. They will be given a worksheet based on their experiment. They will have to discuss the questions within their group. After a certain period of time, they will share their ideas with the class. This activity will boost student imagination, thinking skills, application of knowledge and creativity, as well as cooperation and collaboration with peers.

3. Critical Thinking Activities

Students are involved in more challenging discussions and activities at grade level that are related to higher-order thinking skills according to the revised Bloom’s Taxonomy as below:

Applying

Students can apply their knowledge on any of the topics learned by doing **project work** based on it. They will

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have to present it before the whole class before the end of the school year.

Analyzing

Students will be given a problem based on real life situation and are asked to find out the scientific reason behind it.

Evaluating

Students are given worksheet based on their Phet activity (experimental simulations) and are asked to find the missing values.

Creating

Students can demonstrate their creativity by doing some kind of project work and presenting it before the whole class.

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UNIT 6: OSCILLATION AND WAVES

Stage 1 - Desired Results	
<p>Established Goal(s):</p> <p>In this unit students will observe oscillations in real world; describe properties of electromagnetic waves and sound waves; explain the effects on wavelength and frequency as electromagnetic waves interact with matter. Students will receive an opportunity to perform experiments and note down their results.</p>	
<p>Understanding(s):</p> <p><i>Students will understand ...</i></p> <ul style="list-style-type: none"> • The importance of vibrations and the waves they cause in our everyday lives • Oscillations and its relevance in our everyday lives • How sound is produced • Propagation of sound waves • Properties of sound waves • Uses of ultrasound • The dispersion of light by a prism • The main features of the electromagnetic spectrum • The nature of light • Reflection of light • Refraction and its effects in our day to day life • The revolution created by the application of total internal reflection 	<p>Essential Question(s):</p> <ul style="list-style-type: none"> • What are oscillations and waves? How can we use them? • What is meant by frequency and wavelength? • A pendulum clock is losing time. Is the period too long or too short? Should the pendulum be made shorter or longer? • Why do we see lightning first before hearing the thunder? • Why is it impossible for sounds to travel through a vacuum? • What is an echo? Some fishermen use echoes to locate shoals of fish beneath their boats. Suggest how this works. • Explain why a fish in water appears to be closer to the surface than it really is. • What is the electromagnetic spectrum? • Explain why white light is dispersed to form a spectrum when it passes through a glass prism but laser light is not. • Why are the words 'emergency ambulance' laterally inverted? • What does it mean to say that a plane mirror produces a virtual image? • Why do we see a distorted view when we look through a window that is covered with raindrops? • Light travels more quickly through water than through glass. If so, what could you say about the refractive index of water and glass? • Why must high-purity glass be used for optical fibers used in telecommunications? • How do sound waves behave when it hits the

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	<p>surface that it cannot pass through?</p> <ul style="list-style-type: none"> • How do sound waves behave when it passes from one medium to another different medium? • How do sound waves behave when it passes through the edge or corner of a barrier?
<p>Knowledge: <i>Students will know ...</i></p> <ul style="list-style-type: none"> • A wave is a regularly varying disturbance that travels from place to place • Sounds are vibrations that travel through a material, produced by a vibrating source • Dispersion is the splitting of white light into its component colors • All electromagnetic waves travel at the same speed in vacuum • Refraction is the bending of light as it passes from one transparent material to another of different density • A ray is totally internally reflected when it strikes a boundary at an angle greater than the critical angle 	<p>Skills: <i>Student will be able to:</i></p> <ul style="list-style-type: none"> • Carry out some experiments to observe transverse and longitudinal waves • Describe a method for measuring the speed of sound in air, in the laboratory • Investigate the motion of a simple pendulum and determine its period • To investigate the factors that may affect the period and frequency of a pendulum. • Investigate how the period of oscillation changes as the mass is changed on a spring oscillator • Design and carry out simple experiments to prove that sound can travel through gases, solids, and liquids • Design and make a sound proof box • Investigate the relationship between the angle of incidence and angle of reflection when sound is reflected from an obstacle • Create a soundproof box • Observe and interpret the image formed in a plane mirror. • Observe and interpret the image formed by <ol style="list-style-type: none"> I. convex reflecting surface II. concave reflecting surface
Stage 2 - Assessment Evidence	
<p>Performance Task(s):</p> <p>To assess student progress made in this course, student work in the following activities will be clearly recorded and evaluated according to criteria, rubrics, and the teacher’s discretion. Homework will be given 10% and all the others will be given 30% of student</p>	<p>Other Evidence:</p> <p>The following will also be observed, recorded, and considered for the final grade of students in each lesson activity</p>

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<p>grades.</p> <ul style="list-style-type: none"> • Laboratory Activities <ul style="list-style-type: none"> a. The Simple Pendulum b. Tuning Fork Lab c. Image Formed by a Concave and Convex Reflecting Surfaces • Group Tasks <ul style="list-style-type: none"> a. Classifying musical instruments b. Making a model of a sound wave c. Research: Ultrasound waves and application of electromagnetic Waves d. Producing musical notes • Individual Tasks <ul style="list-style-type: none"> a. Problem solving: speed of sound and light b. Illustrating vibrations on a string 	<ul style="list-style-type: none"> • Motivation • Engagement • Collaboration • Communication pattern among peers and with the teacher • Reactions • Respect to others and different opinions • Group Presentation <ul style="list-style-type: none"> a. Research: Ultrasound waves and application of Electromagnetic Waves • Project <ul style="list-style-type: none"> a. Soundproof Box • Design and carryout simple experiments to prove that sound can travel through gases, liquids and solids. • Reflective Thinking: Write a reflection about Transverse and Longitudinal waves • Unit Questions • Quiz • Interactive simulations: <ul style="list-style-type: none"> a. https://phet.colorado.edu/en/simulation/wave-on-a-string b. https://phet.colorado.edu/en/simulation/color-vision
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Stage 3 - Learning Plan

Learning Activities:

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1. Individual/pair/small group activity

Students will do **hands-on project** to have a vivid and lasting understanding of what they DO much more than what they only hear or see. They will also do **experiments in the laboratory** pertaining to the topic they have learned to have a better understanding of the concept. They will also be given **assignments** on a specific topic requiring them to search for the materials outside their textbook and present it on paper. These activities will enable them build a scientific attitude in their life.

2. Experimental Observation, Discussion and presentation:

Students in pair or in small groups will do experiments in the laboratory or do simulation related to that experiment. They will be given a worksheet based on their experiment. They will have to discuss the questions

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within their group. After a certain period of time, they will share their ideas with the class. This activity will boost student imagination, thinking skills, application of knowledge and creativity, as well as cooperation and collaboration with peers.

3. Critical Thinking Activities

Students are involved in more challenging discussions and activities at grade level that are related to higher-order thinking skills according to the revised Bloom's Taxonomy as below:

Applying

Students can apply their knowledge on any of the topics learned by doing **project work** based on it. They will have to present it before the whole class before the end of the school year.

Analyzing

Students will be given a problem based on real life situation and are asked to find out the scientific reason behind it.

Evaluating

Students will be given a worksheet. The teacher will show a video or the students will perform experimental simulations related to the topic. The students can answer the worksheet after watching the video or performing experimental simulations. After that they are asked to generalize their understanding.

Creating

Students can demonstrate their creativity by doing some kind of project work and presenting it before the whole class.

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 UNIT 7: MAGNETISM AND ELECTRICITY

Stage 1 - Desired Results

Established Goal(s):

In this unit students will be able to explain that electrically charged materials pulls on all other materials and can attract or repel each other charged materials; describe properties of magnetism and demonstrate how magnets can be used to move some things without touching them. Students will receive an opportunity to perform experiments and note down their results.

Understanding(s):

Students will understand ...

- Types of magnets and magnetic materials
- The reason behind magnetism exhibited by certain materials
- Construction and working principle of a loudspeaker
- Construction and working principle of a moving-coil microphone
- The importance of magnetism in storing information

Essential Question(s):

- What is magnetism?
- Some books say that ‘repulsion is the only test for a magnet’. Why is attraction on its own is not enough?
- A student has a magnetic compass. He also has three metal bars painted to look the same. One is copper, one is unmagnetized iron, and the other is a permanent magnet. Describe how he can find out which bar is the magnet.
- Describe two ways of turning an unmagnetized steel rod into a permanent magnet.
- Describe two ways of demagnetizing a steel rod which has become magnetized.
- Explain why a permanent magnet should be made of steel rather than iron.
- Define electromagnetic induction.
- An electromagnet can be switched on and off. Suggest one situation where this would be an advantage over the constant field of a permanent magnet.
- How can we use magnetism in technology?
- How can information be stored digitally?
- Give two ways in which a loudspeaker is like a motor. Give two differences between a loudspeaker and a motor.
- Good loudspeakers have their paper cones attached to a heavy metal frame. Suggest why this is.
- A student fixes a pair of loudspeakers into special wooden cabinets. After she has finished she finds that her screwdriver is magnetized. Suggest why.

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<p>Knowledge:</p> <p><i>Students will know ...</i></p> <ul style="list-style-type: none"> • Like poles repel, unlike poles attract • Soft magnetic materials are easily magnetized and demagnetized. Hard magnetic materials retain their magnetism • Magnetic fields are represented by field lines • Electromagnets have the advantage over permanent magnets that they can be switched on and off • A current-carrying coil in a magnetic field experiences a turning effect. Use is made of this effect in electric motors • A force is exerted on any current-carrying conductor that crosses a magnetic field. The direction of the force depends on the direction of the field and the current • The relative directions of force, field and current are given by Fleming’s left-hand rule • When a conductor is moved so that it cuts across a magnetic field, an e.m.f. is induced between its ends. If the conductor is part of a complete circuit, an induced current will flow. 	<p>Skills:</p> <p><i>Student will be able to:</i></p> <ul style="list-style-type: none"> • Design an experiment to test the statement ‘magnetic forces only act over small distances’. • Plot magnetic field pattern for a bar magnet • Investigate the strength of the magnetic force between two magnets • Calculate the strength of the magnetic force by performing an experiment • Design an alarm system and explain how it works • Construct an electromagnet • Investigate and construct a stronger electromagnet • Explain magnetization and demagnetization using the idea of molecular magnets. • Make and test a magnet. • Demagnetize a magnet. • Use the idea of induced magnetism to explain how a piece of iron or steel can be magnetized. • Investigate magnetic effect of electricity
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Stage 2 - Assessment Evidence

<p>Performance Task(s):</p> <p>To assess student progress made in this course, student work in the following activities will be clearly recorded and evaluated according to criteria, rubrics, and the teacher’s discretion. Homework will be given 10% and all the others will be given 30% of student grades.</p> <ul style="list-style-type: none"> • Laboratory Activities <ul style="list-style-type: none"> a. Mapping a Magnetic Field b. Magnetic Effect of Electricity • Group Tasks <ul style="list-style-type: none"> a. Plotting magnetic field patterns 	<p>Other Evidence:</p> <p>The following will also be observed, recorded, and considered for the final grade of students in each lesson activity</p> <ul style="list-style-type: none"> • Motivation • Engagement • Collaboration • Communication pattern among peers and with the teacher • Reactions • Respect to others and different opinions • Research Assignment <ul style="list-style-type: none"> a. Application of Electromagnets • Demonstration <ul style="list-style-type: none"> a. Dynamo effect
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<ul style="list-style-type: none"> b. Magnetizing and Demagnetizing an iron nail • Project <ul style="list-style-type: none"> a. Solenoid motor b. DC Motor • Individual Task <ul style="list-style-type: none"> a. Labeling diagrams (Simple d.c. motor) 	<ul style="list-style-type: none"> • Interactive Simulation <ul style="list-style-type: none"> a. Design a roller coaster a. http://www.learner.org/interactives/parkphysics/coaster/ b. https://phet.colorado.edu/en/simulation/charges-and-fields c. https://phet.colorado.edu/en/simulation/balloons-and-static-electricity • Unit Questions • Reflective Thinking <ul style="list-style-type: none"> a. Writing a reflection
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Stage 3 - Learning Plan

Learning Activities:

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2. Experimental Observation, Discussion and presentation:

Students in pair or in small groups will do experiments in the laboratory or do simulation related to that experiment. They will be given a worksheet based on their experiment. They will have to discuss the questions within their group. After a certain period of time, they will share their ideas with the class. This activity will boost student imagination, thinking skills, application of knowledge and creativity, as well as cooperation and collaboration with peers.

3. Critical Thinking Activities

Students are involved in more challenging discussions and activities at grade level that are related to higher-order thinking skills according to the revised Bloom's Taxonomy as below:

Applying

Students can apply their knowledge on any of the topics learned by doing **project work** based on it. They will have to present it before the whole class before the end of the school year.

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Analyzing

Students will be given a problem based on real life situation and are asked to find out the scientific reason behind it.

Evaluating

Students will be given a worksheet. The teacher will show a video or the students will perform experimental simulations related to the topic. The students can answer the worksheet after watching the video or performing experimental simulations. After that they are asked to generalize their understanding.

Creating

Students can demonstrate their creativity by doing some kind of project work and presenting it before the whole class.

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UNIT 9: INSIDE PLANET EARTH

Stage 1 - Desired Results	
<p>Established Goal(s):</p> <p>In this unit students will demonstrate an understanding about the materials that make up the earth, including rocks, minerals, soils, and fossils, and how they are formed. Students will receive an opportunity to perform experiments and note down their results.</p>	
<p>Understanding(s):</p> <p><i>Students will understand ...</i></p> <ul style="list-style-type: none"> • Crust, mantle and core • Radiometric dating • Rock cycle • Different types of weathering • Tectonic processes • Theory of plate tectonics • Reason behind the occurrence of natural calamities like earthquake, tsunami, volcanic eruption etc. • The difference between a constructive plate margin and a destructive plate margin 	<p>Essential Question(s):</p> <ul style="list-style-type: none"> • What is inside the Earth? How do we know? • How are rocks formed and destroyed? • What cause earthquakes? • How is our planet changing? • What is the difference between a rock and a mineral? • Why are most igneous rocks crystalline? • Why don't we find dinosaur fossils in coal? • How do changes in one part of the Earth system affect other parts of the system?
<p>Knowledge:</p> <p><i>Students will know ...</i></p> <ul style="list-style-type: none"> • Earth's systems continually interact at different rates of time, affecting the Earth locally and globally • Erosion is the movement of materials and weathering is the breakage of bedrock and larger rocks into smaller rocks and soil materials • The theory of plate tectonics explains the features of Earth's surface, earthquakes and volcanoes • The internal energy of the Earth drives the movement of the plates 	<p>Skills:</p> <p><i>Student will be able to:</i></p> <ul style="list-style-type: none"> • Make a model of the Earth. • Identify different rocks. • Identify ways on finding out age of the Earth. • Investigate on continental drift • Investigate on the reasons behind the occurrence of natural calamities like earthquake, volcanic eruption, tsunami etc. • Evaluate slow processes (e.g. weathering, erosion, mountain building, sea floor spreading) to determine how the Earth has changed and will continue to change over time • Evaluate fast processes (e.g. volcanoes, earthquakes) to determine how the Earth has changed and will continue to change over time • Investigate the effect of flowing water on landforms

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	<ul style="list-style-type: none"> • Investigate on how to make use of the hot rocks deep inside the Earth’s crust • Investigate on why the builders chose slate for the roof, clay bricks for the corners of the house and flint for the walls of the house • Investigate on what might happen when two continents eventually collide
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Stage 2 - Assessment Evidence

<p>Performance Task(s):</p> <p>To assess student progress made in this course, student work in the following activities will be clearly recorded and evaluated according to criteria, rubrics, and the teacher’s discretion. Homework assignments will be given 10% and all the others will be given 30% of student grades.</p> <ul style="list-style-type: none"> • Laboratory Activity <ul style="list-style-type: none"> a. Rocks • Group Tasks <ul style="list-style-type: none"> a. Tectonic Processes demonstration b. Writing Video Documentary Report c. Making Models of Earth’s structure d. Demonstration: How each type of Rock is formed • Individual Tasks <ul style="list-style-type: none"> a. Illustrating joints and faults b. Drawing and labeling the Rock cycle • Research: <ul style="list-style-type: none"> a. Devastating Earthquakes in the World b. Earthquakes Record in Vietnam c. Safety Measures During Earthquakes 	<p>Other Evidence:</p> <p>The following will also be observed, recorded, and considered for the final grade of students in each lesson activity</p> <ul style="list-style-type: none"> • Motivation • Engagement • Collaboration • Communication pattern among peers and with the teacher • Reactions • Respect to others and different opinions • Research Presentations <ul style="list-style-type: none"> a. Devastating earthquakes in the world b. Earthquakes record in Vietnam c. Safety Measures during Earthquakes • Project: <ul style="list-style-type: none"> a. Rock Cycle Diorama b. Structure of the Earth Diorama • Reflective Thinking: Writing a Reflection about Earthquakes • Unit Questions • Quiz • Interactive Simulations <ul style="list-style-type: none"> a. https://phet.colorado.edu/en/simulation/legacy/plate-tectonics b. https://phet.colorado.edu/en/simulation/legacy/radioactive-dating-game
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Stage 3 - Learning Plan

Learning Activities:
In this course, students are involved in a variety of class activities to understand concepts of Physics in a deeper

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level. In doing so they will be able to relate and apply whatever they have learned to their day to day life, to use and apply scientific principles and to improve their research skills appropriate to their grade level. The following is a summary of lesson activities for the course.

1. Individual/pair/small group activity

Students will do **hands-on project** to have a vivid and lasting understanding of what they DO much more than what they only hear or see. They will also do **experiments in the laboratory** pertaining to the topic they have learned to have a better understanding of the concept. They will also be given **assignments** on a specific topic requiring them to search for the materials outside their textbook and present it on paper. These activities will enable them build a scientific attitude in their life.

2. Experimental Observation, Discussion and presentation:

Students in pair or in small groups will do experiments in the laboratory or do simulation related to that experiment. They will be given a worksheet based on their experiment. They will have to discuss the questions within their group. After a certain period of time, they will share their ideas with the class. This activity will boost student imagination, thinking skills, application of knowledge and creativity, as well as cooperation and collaboration with peers.

3. Critical Thinking Activities

Students are involved in more challenging discussions and activities at grade level that are related to higher-order thinking skills according to the revised Bloom's Taxonomy as below:

Applying

Students can apply their knowledge on any of the topics learned by doing **project work** based on it. They will have to present it before the whole class before the end of the school year.

Analyzing

Students will be given a problem based on real life situation and are asked to find out the scientific reason behind it.

Evaluating

Students will be given a worksheet. The teacher will show a video or the students will perform experimental simulations related to the topic. The students can answer the worksheet after watching the video or performing experimental simulations. After that they are asked to generalize their understanding.

Creating

Students can demonstrate their creativity by doing some kind of project work and presenting it before the whole class.

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