APPENDIX - 2
ACTIVITY BASED LEARNING (ABL) PACKAGE

1. PRIMARY PROCESS SKILLS

SKILL -1 OBSERVATION

OBJECTIVE:
Students able to observe correctly from the given materials or set of instruments.

ACTIVITY -1

You are provided with a Football. When you kicked in a different direction, it continues its motion in a new direction, observe carefully and answer the question below.

Question:
1. The force can change the __________ of motion of a body
   a) density   b) volume   c) direction

Answer: you are correct if your answer is
   c) direction

ACTIVITY -2

You are provided with a Spinning top observe the motion carefully and answer the question below.

Question:
An object rotates about an axis is called ________________
   a) Oscillatory motion
   b) Vibrational motion
   c) Rotational motion

Answer:
You are correct if your answer is c) Rotational motion
ACTIVITY -3

You are provided to see the image on a screen formed by the concave mirror by an object placed in front of the mirror observe carefully and answer the following questions.

Questions:
1. The image is formed by the concave mirror is ________
   a) correct    b) real
2. The image is formed by the mirror is ________________
   a) inverted    b) vertical

Answer:
You are correct if your answer is
1. b) real  2. a) inverted

POST TEST ACTIVITIES

ACTIVITY -1

You are provided with a plane mirror. You can see your face in the mirror. How image is formed? Observe carefully following questions.

Questions:
1. The image is ________________
   a) Virtual    b) real
2. The size of the image is ________________
   a) Big    b) Same

ACTIVITY -2

You are provided with three test tubes first test tube is contain a stone. Second test tube is containing water and the third test tube is containing gas. (atmospheric gas). Observe carefully and answer the following questions.

Questions:
1. The solid (stone) has a ________ shape.
   a) definite    b) No definite
2. Liquids generally ________________
   a) does not flow    b) flows easily
ACTIVITY -3

You are provided with sharpener and a pencil. Observe carefully the turning a pencil in a sharpener and answer the following questions.

Question:
1. Two equal and unlike parallel forces ____________ at a point constitute a couple.
   a) acting  b) not acting

SKILL -2 IDENTIFICATION / SELECTION

OBJECTIVE:
Students able to select or identify the appropriate instruments or materials from a given set of instruments or materials.

ACTIVITY -1

You are provided Tomato, Banana, Date and Guava. Fleshy fruits like Berry are normally indehiscent and their seeds are released only after the decay of the pericarp.

Identify which of the following is a one seeded berry.

Tomato  Banana  Guava  Date

Question:
1. ____________ is a one seeded Berry
   a) Tomato  b) Banana  c) Date  d) Guava

Answer:
You are correct if your answer is c) Date
ACTIVITY -2

You are provided with Football, Spinning top and simple pendulum. Identify which one is used for oscillatory motion.

Question:
The instrument is used for oscillatory motion is ________________
   a) Football       b) Spinning Top       c) Simple pendulum

Answer:
You are correct if your answer is c) Simple pendulum

ACTIVITY -3

You are provided toys of some animals Deer, Monkey, Tiger, Elephant. Primary consumer directly depends on the producers for food. Secondary consumers feed on primary consumers.

Identify which one of the following animal is secondary consumer.

Question:
1. __________ is a secondary consumer
   a) Deer       b) Monkey       c) Tiger       d) Elephant

Answer:
You are correct if your answer is c) Tiger
POST TEST ACTIVITIES

ACTIVITY -1
You are provided with three test tube containing ink, mixture of oil and water and mixture of sugar and sand.

Colloids are suspension that contain extremely small particles. They do not settle down. Identify which one is colloids.

Question:
1. The colloid is ________________________
   a) ink     b) mixture of oil and water
   c) mixture of sugar and sand

ACTIVITY -2
You are provided a fish (toy). The fish body is streamlined and boat like. The body shows three main regions.

Question:
1. Identify the fish have absence of ____________ region.
   a) Head     b) neck    c) trunk    d) tail

ACTIVITY -3
You are provided with carrot, beans, banana and cigarette.
Identify which one of the following item is cause for cancer.

Question:
1. Usage of ____________ is cause for cancer.
   a) Carrot   b) beans   c) banana   d) Cigarette

SKILL -3 CLASSIFICATION

OBJECTIVE:
Students able to classify the given materials or things accordingly.

ACTIVITY -1
You are provided with 6 test tube containing mixture of Alcohol and water, Mixture of Oil and water, mixture of milk and water, mixture of sand and salt, mixture of sugar and sand, Air.

Mixtures are classified as homogeneous and heterogeneous mixtures. Homogeneous mixture contains only one phase. Heterogeneous mixture contains more than one phase Classify them as homogeneous and heterogeneous mixtures.

Answer: You are correct if your answer is

<table>
<thead>
<tr>
<th>Homogeneous mixtures</th>
<th>Heterogeneous mixtures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mixture of alcohol and water</td>
<td>1. Mixture of oil and water</td>
</tr>
<tr>
<td>2. Air</td>
<td>2. Mixture of sand and salt</td>
</tr>
<tr>
<td>3. Mixture of milk and water</td>
<td>3. Mixture of sugar and sand</td>
</tr>
</tbody>
</table>
ACTIVITY -2
You are provided some test tube containing Sodium, Ammonia, Magnesium, Calcium Carbonate, Potassium and Sodium Chloride classify them according to elements and compounds.

**Answer:** You are correct if your answer is

<table>
<thead>
<tr>
<th>Elements</th>
<th>Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>Ammonia</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Calcium Carbonate</td>
</tr>
<tr>
<td>Potassium</td>
<td>Sodium Chloride</td>
</tr>
</tbody>
</table>

POST TEST ACTIVITIES

ACTIVITY -1
You are provided some toys of different motion. Classify them according to translational motion and rotational motion

- Moving foot ball
- Electric fan
- Spinning Top
- Aeroplane

ACTIVITY -2
You are provided Grass water, ant, salt, butterfly, steel, grasshopper and sand. Classify them as abiotic and biotic components.

ACTIVITY -3
You are provided with rice, wheat, cotton, soybean, sugarcane, Groundnut, Jute and tobacco. Classify them as food crops and cash crops.

Crops are plants grown in a community on a large scale. Commercially, depending on the plant products.

SKILL -4 MEASURING

**OBJECTIVE:**

Students able to measure or estimate with reasonable accuracy.

ACTIVITY -1
You are provided with an experimental set up to determined the radius of curvature of a concave mirror.

Adjust the mirror such that a well defined image is formed. The distance between the object and the concave mirror give the radius of curvature of mirror.

**Question:**
The radius of the concave mirror = __________
ACTIVITY -2

You are provided with an experimental set up to measure the image distance.

The object is placed beyond C the image is formed between C and F. The image is small, real and inverted.

Question:
The distance between convex mirror and screen that is image distance = ______________ cm.

ACTIVITY -3

You are provided a experimental set up to determination of weight of a body using principle of moment. Adjust the positions of \( W_1 \) and \( W_2 \).

Measure the distance between the point \( G \) and \( A = (d_1) \) and measure the distance \( BG = (d_2) \)

Answer:
1. The distance between the point \( G \) and \( A = \) __________
2. The distance between the point \( G \) and \( B = \) __________

POST TEST ACTIVITIES

ACTIVITY -1

You are provided with scale, and thread.
Measure the distance and displacement of the following diagram.

Question:
Distance = ___________ cm
Displacement = ___________ cm

ACTIVITY -2

You are provided with a simple pendulum. The simple pendulum is suspended from a rigid support. The length of the string from the point of suspension to the centre of the bob is 70 cm (0.7m)

Measure the time taken by the pendulum to undergo 20 complete oscillation.

Question:
Time for 20 oscillations = ___________ sec.
ACTIVITY -3
You are provided with beaker, thermometer, spirit lamb, and water. Take 100 ml of water in a beaker and introduce a thermometer into it. Heat it with a spirit lamp.

**Question:**
Boiling point of water = __________°C

SKILL -5 INFERRING

**OBJECTIVE:**
Student able to infer from the observed phenomena.

ACTIVITY -1
You are provided with a ball. Catch the fast moving ball by stretching your hands straight and catch the ball by moving your hands in the direction of the motion of the ball. What you feel? Record your inference.

**Answer:**
If we catch the ball with rigid hands, in a shorter time of contact the ball will strike our hands with a violent force. But when we move our hands backward while catching the ball, the time of contact is increased and the force is reduced. So we feel lesser force and pain and also catch the ball without jumping out of our hand.

ACTIVITY -2
You are provided with a book and a table. The book is placed on the table. According to the Newton’s 3rd law of motion, the book is not fall on the ground why? Inference your observation.

**Answer:**
The book applies a force downward on the table is action. An equal and opposite force is exerted by the table upwards on the book and this is reaction.

\[ F_{B\text{ on } T} = - F_{T\text{ on } B} \]

ACTIVITY -3
A long spring is placed horizontal and one end is tied to a wall. The free end of the spring is suddenly pushed and pulled. What happened? Inference your observation.

**Answer:**
When you pushed and pulled the spring, it create a pulse of compression and rarefaction which move along what spring. The particles of the spring vibrate parallel to the direction of the wave is longitudinal in nature. The regions where the coils become closer are called compression (C). The region where the coils are farther apart are called rarefractions(R).
POST TEST ACTIVITIES

ACTIVITY -1
You are provided with water, sand, oil and two beakers.

Add salt to a beaker of water and stir the salt seems to disappear. If you add cooking oil to water, what happens? Infer your observation.

ACTIVITY -2
You are provided with tuning fork. Place the stem of a vibrating tuning fork on the top of a table, what happens? Infer your observation.

ACTIVITY -3
You are provided with loose hammer head.

How will you tighten a loose hammer head? When the hammer is brought down, the hammer head tightens on the handle. Record your inference from the observation.

B. INTEGRATED PROCESS SKILLS

SKILL – 6 FORMULATION OF HYPOTHESIS
OBJECTIVE:
Students able to formulate an appropriate hypothesis

ACTIVITY -1
Verification of 1st law of stretched strings the experimenter tabulated the following values. There are two variables in the experiment one is independent and there is dependent. The change in one variable affects the other variable. The relation between the two variables are called hypothesis. Study the above values and answer the following questions:

1. Independent variable is __________________
2. Dependent variable is __________________
The hypothesis is __________________

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Frequency (n) Hz</th>
<th>Resonating length (l) m</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>265</td>
<td>0.56</td>
</tr>
<tr>
<td>2</td>
<td>384</td>
<td>0.63</td>
</tr>
<tr>
<td>3</td>
<td>420</td>
<td>0.71</td>
</tr>
<tr>
<td>4</td>
<td>512</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Answer:
Independent variable = Frequency
Dependent variable = Resonating length
Hypothesis:
The frequency is inversely proportional to resonating length in sonometer.
ACTIVITY -2
Verification of Charles' law, the experimenter tabulated the following values. There are two variables in the experiment one is independent and there is dependent. The change in one variable affects the other variable. The relation between the two variables are called hypothesis. Study the above values and answer the following Questions:
1. Independent variable is_________________
2. Dependent variable is_________________
The hypothesis is _____________________
Answer:
Independent variable = Temperature
Dependent variable = Volume
Hypothesis:
Volume is directly proportional to temperature of a gas at a constant pressure.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Temperature (T°C)</th>
<th>Volume (V ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
<td>105</td>
</tr>
</tbody>
</table>

ACTIVITY -3
Determination of the focal length of a concave mirror using UV - method, the experimenter tabulated the following values. There are two variables in the experiment. One is independent and there is dependent.
The change in one variable affects the other variable. The relation between the two variables are called hypothesis. Study the above values and answer the following Questions:
1. Independent variable is_________________
2. Dependent variable is_________________
The hypothesis is _____________________
Answer:
Independent variable = Object distance (u)
Dependent variable = Image distance (v)
Hypothesis:
Object distance increases image distance decreases.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Object distance (u)m</th>
<th>Image distance (V) m</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.35</td>
<td>1.08</td>
</tr>
<tr>
<td>2</td>
<td>1.45</td>
<td>0.97</td>
</tr>
<tr>
<td>3</td>
<td>1.55</td>
<td>0.89</td>
</tr>
<tr>
<td>4</td>
<td>1.65</td>
<td>0.78</td>
</tr>
<tr>
<td>5</td>
<td>1.75</td>
<td>0.67</td>
</tr>
</tbody>
</table>
POST TEST ACTIVITIES

ACTIVITY -1
In the verification of laws of simple pendulum the experimenter tabulated the following. There are two variable in the above experiment. The relation between the two variables are called hypothesis. Study the above values and answer the following.

Questions:
1. Independent variable is ________________
2. Dependent variable is ________________
   The hypothesis is ________________

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Length l (m)</th>
<th>Period T (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.7</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>0.8</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>0.9</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>1.0</td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>1.1</td>
<td>34</td>
</tr>
</tbody>
</table>

ACTIVITY -2
The displacement of a train moving at a constant speed or straight tracks are given in the table.

<table>
<thead>
<tr>
<th>Time (Sec)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement (m)</td>
<td>0</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>

There are two variable in the above experiment. The relation between the two variables are called hypothesis. Study the above values and answer the following.

Questions:
1. Independent variable is ________________
2. Dependent variable is ________________
   The hypothesis is ________________

ACTIVITY -3
The amount of water and time taken for boiling are given in the table. There are two variable in the above experiment. The relation between the two variables are called hypothesis. Study the above values and answer the following.

Questions:
1. Independent variable is ________________
2. Dependent variable is ________________
   The hypothesis is ________________

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Amount of water (ml)</th>
<th>Time taken for boiling (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>150</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>200</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>250</td>
<td>30</td>
</tr>
</tbody>
</table>
SKILL – 7 DESIGNING EXPERIMENTAL SET UP

OBJECTIVE:
Students able to design an experimental set up for the activities.

ACTIVITY - 1
The materials needed for the preparation of methane are given below. Design the experimental set up.

Materials:
Hard glass tube, sodium acetate, soda lime, inverted gas jar, one hold cark and candle.

ACTIVITY - 2
The materials needed to prove the inertia of rest are given below. Design the experimental set up.

Materials:
Two glass tumblers, wooden scale, long road

ACTIVITY - 3
The materials needed to prove the experiment of Inertia of mass. Design the experimental set up.

Materials:
Small cardboard, glass of water, match box and egg.

POST TEST ACTIVITIES

ACTIVITY - 1
The materials needed for the determination of the focal length of a concave mirror are given below. Design the experimental set up.

Materials:
Concave mirror, stand, object screen, scale.

ACTIVITY - 2
The materials needed to show that medium is required for the propagation of sound. Design the experimental set up.

Materials:
Conical flask, water, jingle bells, string and stopper.

ACTIVITY - 3
The materials needed for the preparation of Ethyne are given below. Design the experimental set up.

Materials:
Conical flask, two hole cark, dropping funnel, inverted gas jar, water beaker
SKILL - 8 TESTING HYPOTHESIS

OBJECTIVE:

Students able to record the stages of testing a hypothesis.

ACTIVITY -1

Given below is a hypothesis “Temperature of a substance does not depend on the size of particles of the object”. Record the stages to test the above hypothesis. Using given experimental setup.

Answer:

\textit{Stages to test the hypothesis.}

1. The variables in the above hypothesis are
   
   a) Temperature 
   b) size of particles

2. You are provided four different size of cups (A,B,C,D) containing different amount of water, and a mercury thermometer.

3. Measure the temperature of water in cups A,B,C,D and tabulated the readings.

\begin{tabular}{|c|c|}
\hline
S.No. & Different Amount of water \\
\hline
1 & 50ml (A) \\
2 & 100 ml (B) \\
3 & 150ml (C) \\
4 & 200 ml (D) \\
\hline
\end{tabular}

ACTIVITY -2

Given below is a hypothesis “The amount of water is directly proportional to time taken for boiling”. Record the stages to test the above hypothesis using given experimental set up.

Answer:

\textit{Stages to test the hypothesis.}

1. The variables in the above hypothesis are
   
   a) Amount of water 
   b) Time

2. You are provided a beaker containing water, thermometer and stop clock.

3. Measure the time taken for boiling of 100 ml and 200ml and tabulated the readings.

\begin{tabular}{|c|c|c|}
\hline
S.No. & Amount of water & Time taken for boiling \\
\hline
1 & 100ml (A) \\
2 & 200 ml (B) \\
\hline
\end{tabular}

ACTIVITY -3

Given below is a hypothesis “In sonometer the frequency increases the resonating length decreases.”

Record the stages to test the above hypothesis using the given set up.

Answer:

\textit{Stages to test the hypothesis.}

The variables are;

a) Frequency   b) Resonating length

1. Place a one Kg weight on the weight hanger.

2. Gently strike a tuning fork of known frequency and place its stem on the sonometer box.

3. Measure the resonating length (l)

4. Repeat the experiment with tuning forks of different frequencies.

\begin{tabular}{|c|c|c|}
\hline
S.No. & Frequency (n) Hz & Resonating length (l)m \\
\hline
1 & 256 \\
2 & 384 \\
3 & 420 \\
4 & 512 \\
\hline
\end{tabular}
POST TEST ACTIVITIES

ACTIVITY -1
Given below is a hypothesis “The length of the pendulum is increases, the period of oscillation also increases”.

You are provided with simple pendulum, stop clock and scale. Record the stages to test the above hypothesis.

ACTIVITY -2
Given below is a hypothesis “The object distance of a concave mirror is inversely proportional to the image distance.”

You are provided with illuminated wiremesh concave mirror, screen, and scale.

Record the stages to test the above hypothesis.

ACTIVITY -3
Given below is a hypothesis “In sonometer increase the weight in the weight hanger. Inversely proportional to (decreases) the resonating length”.

You are provided sonometer, tuning fork and different weights 1kg, 2 kg, 3 k, 4 kg and 5 Kg. Record the stages to test the above hypothesis.

SKILL -9 REVISION OF HYPOTHESIS

OBJECTIVE:
Students able to revise the hypothesis by selecting the statements, which support or does not support the given hypothesis.

ACTIVITY -1
Given below is a hypothesis and few statements relating to the same. Mark ‘S’ the statement that support the hypothesis and ‘NS’ the statement that does not support the hypothesis. Revise the hypothesis on the basis of the data supplied.

Hypothesis:
All the motions are translational motions.

Statements:
6. The motion of an arrow
7. A bullet fired from a rifle
8. A swing
9. A fast moving football
10. A speeding Train

Answer
Statements 1,2,4,5 support the hypothesis and 3 does not support the hypothesis.

Revised hypothesis:
All the motions except the motion of the swing are translational motion.
ACTIVITY -2

Given below is a hypothesis and few statements relating to the same. Mark ‘S’ the statement that support the hypothesis and ‘NS’ the statement that does not support the hypothesis. Revise the hypothesis on the basis of the data supplied.

Hypothesis:

“All the mixtures are heterogeneous mixtures”.

Statements:
1. Mixture of oil and water contain two phases.
2. Mixture of sand and salt contains 2 phases.
3. Mixture of sugar and sand contains 2 phases.
4. Mixture of alcohol and water contain only one phase.

Answer

Statements 1,2,3 support the hypothesis. Statement 4 does not support the hypothesis.

Revised hypothesis:

“All the mixtures except mixture of alcohol and water are heterogeneous mixtures”.

ACTIVITY -3

Given below is a hypothesis and few statements relating to the same. Mark ‘S’ the statement that support the hypothesis and ‘NS’ the statement that does not support the hypothesis. Revise the hypothesis on the basis of the data supplied.

Hypothesis:

“All type of images formed in a convex mirror.”

Statements:
1. The image is virtual.
2. The image is erect.
3. The image is small.
4. The image is real.

Answer

Statements 1,2,3 support the hypothesis and 4 does not support the hypothesis.

Revised hypothesis:

“All type of images except real image formed in a convex mirror.”
POST TEST ACTIVITIES

ACTIVITY -1
Given below is a hypothesis and few statements relating to the same. Mark ‘S’ the statement that support the hypothesis and ‘NS’ the statement that does not support the hypothesis. Revise the hypothesis on the basis of the data supplied.

Hypothesis:
“All quantities that require only magnitudes are scalar quantities.”

Statements:
1. Mass has only magnitude.
2. Length has only magnitude.
3. Time has only magnitude.
4. Force has both magnitude and direction.
5. Temperature has only magnitude

Revised hypothesis:

ACTIVITY -2
Given below is a hypothesis and few statements relating to the same. Mark ‘S’ the statement that support the hypothesis and ‘NS’ the statement that does not support the hypothesis. Revise the hypothesis on the basis of the data supplied.

Hypothesis:
“All actions the two equal and unlike parallel forces not acting at a point constitute a couple.”

Statements:
1. Opening a pen
2. Turning a screw driver
3. Moving foot ball
4. Turning a pencil in a sharpener
5. Unscrewing an ear – ring

Revised hypothesis:

ACTIVITY -3
Given below is a hypothesis and few statements relating to the same. Mark ‘S’ the statement that support the hypothesis and ‘NS’ the statement that does not support the hypothesis. Revise the hypothesis on the basis of the data supplied.

Hypothesis:
“All the fruit are seedless fruits.”

Statements:
1. Tomato is a seedless fruit.
2. Guva is a seedless fruit.
3. Orange is a seedless fruit.
4. Pomegranate is a seedless fruit.
5. Dates is a seeded fruit.

Revised hypothesis:
SKILL - 10 FORMULATION OF GENERALISATION

OBJECTIVE:
Students able to identify the generalization in a given set of statements and to formulate a generalization based on a set of observations.

ACTIVITY -1
Read the following statements and formulate generalization.
1. When a man jumps from a boat floating on water, it is the action. The boat moving away from him is due to reaction.
2. The air filled in a balloon is released, the air rushing out vertically downwards is the action. The balloon moved upward in a direction opposite to that of air and this is the reaction.
3. A swimmer pushes the water in the backward direction is the action. The water pushes the swimmer forward with an equal and opposite force and this is reaction.
4. A book placed on the table applies a force downward is action. An equal and opposite force is exerted by the table upwards on the book and this is reaction

Generalisation : _______________
Answer:
To every action, there is always an equal and opposite reaction.
Action = − Reaction

ACTIVITY -2
Read the following statements and formulate generalization.
1. Mass require only magnitude
2. Length require only magnitude.
3. Time require only magnitude.
4. Temperature require only magnitude.

Generalisation : ______________
Answer:
Quantities that require only magnitudes to specify them are called scalar quantities.

ACTIVITY -3
Read below some statements relating to ecosystem study the statements and draw generalisation.
1. Natural ecosystem includes terrestrial and aquatic.
2. Artificial ecosystem are those produced and controlled by man.
3. The trophic levels in an ecosystem, include producers, consumers and decomposers.
4. Pond ecosystem is a classical example of an ecosystem.
5. Forest ecosystem is an example for terrestrial ecosystem.

Generalisation : ______________
Answer :
Ecosystem is the basic unit which arises due to interactions between organisms and environmental factors.
POST TEST ACTIVITIES

ACTIVITY -1
Given below some statements relating to the image of an object, study the statements and draw generalisation.
1. The image of the object is diminished.
2. The image of the object is inverted.
3. The image of the object is real.
Generalisation: ____________________

ACTIVITY -2
Read the following statements carefully and formulate generalisation.
1. The equation is written in words.
   Hydrogen + oxygen → Water
2. The words are replaced by formulate and symbols.
   \[ H_2 + O_2 \rightarrow H_2O \]
3. The number of atoms of each element on either side of the equation must be equal.
   \[ 2H_2 + O_2 \rightarrow 2H_2O \]
4. The physical state may be mentioned.
   \[ 2H_2(g) + O_2(g) \rightarrow 2H_2O (l) \]
Generalisation: ____________________

ACTIVITY -3
Given below some statements relating to covalent bond study the statements and draw generalisation.
1. Most of the covalent compounds are either gases or liquids.
2. Covalent compounds have low melting and boiling points.
3. The electrical conductivity of covalent compounds is poor.
4. They are soluble in organic solvents. Eg. Benzene.
Generalisation: ____________________
III. SCIENTIFIC COMMUNICATION SKILLS

SKILL – 11 INQUIRY

OBJECTIVE:
Students able to ask different type of question about the observed phenomena.

ACTIVITY -1

Observe carefully the experimental set up of laboratory preparation of Ethyne. Write four relevant questions about the set up.

Questions:
1. Write the molecular formula of Ethyne
2. How is ethyne prepared?
3. What is the molecular weight of Ethyne?

ACTIVITY -2

Observe carefully the four strokes in a petrol engine and write relevant four questions.

Answer:
1. What are the four different type of strokes in steam engine?
2. What happens to when the piston moves down in take stroke?
3. As the compression increases what happens to the efficient?
4. What is the reason for the rotational motion of the usual?

ACTIVITY -3

Observe the fractional distillation of crude oil in a refinery and write four questions about the set up.

Questions:
1. What is meant by refining?
2. What do you mean by Petroleum?
3. At which temperature do we get kerosene?
4. What are the uses of residue from fractional distillation?
POST TEST ACTIVITIES

ACTIVITY -1
Observe the experimental set up carefully production of canal rays write four relevant questions about the set up.

ACTIVITY -2
Observe the Alpha Scattering experimental set up carefully and write four questions about the set up.

ACTIVITY -3
Observe carefully the system of reproduction of sound from films and write four relevant questions.

SKILL – 12 ARRANGING DATA IN A TABULATED FORM
OBJECTIVE:
Students able to arrange the given data in the tabulated form.

ACTIVITY -1
The speeds of different motions of rat, man, cheetah, speed of sound, mean velocity at earth round the sun and speed of light are given by 1.8 km/h⁻¹, 3.6 km/h⁻¹, 90 km/h⁻¹, 1224 km/h⁻¹, 1,07,208 km/h⁻¹ and 10.8 x 10⁸ km/h⁻¹ respectively arrange the above data in tabulated form by giving suitable heading.
Answer:
Your are correct if your table is.

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>Motion</th>
<th>Speed km/h⁻¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rat</td>
<td>1.8</td>
</tr>
<tr>
<td>2</td>
<td>Man</td>
<td>3.6</td>
</tr>
<tr>
<td>3</td>
<td>Cheetah</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>Speed of sound</td>
<td>1,224</td>
</tr>
<tr>
<td>5</td>
<td>Earth velocity</td>
<td>1,07,208</td>
</tr>
<tr>
<td>6</td>
<td>Speed of light</td>
<td>10.8 x 10⁸</td>
</tr>
</tbody>
</table>
ACTIVITY -2

The normal body temperatures of man, dog, stallion, Rabbit, Sheep and cow was found to be 36.9°C, 38.9°C, 37.6°C, 39.5°C, 39.4°C and 38.6°C respectively. Arrange the above data in tabular form by giving suitable heading.

Answer:
Your are correct if your table is.

<table>
<thead>
<tr>
<th>S. NO</th>
<th>Animal</th>
<th>Normal Temperature °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Man</td>
<td>36.9</td>
</tr>
<tr>
<td>2</td>
<td>Dog</td>
<td>38.9</td>
</tr>
<tr>
<td>3</td>
<td>Stallion</td>
<td>37.6</td>
</tr>
<tr>
<td>4</td>
<td>Rabbit</td>
<td>39.5</td>
</tr>
<tr>
<td>5</td>
<td>Sheep</td>
<td>39.4</td>
</tr>
<tr>
<td>6</td>
<td>Cow</td>
<td>38.6</td>
</tr>
</tbody>
</table>

ACTIVITY -3

The audible range of sound for elephant, human being, Rodents Bat and sea lions are 16 – 12,000 Hz, 20 -20,000Hz, 1000 -1,00,000 Hz , 1000 – 1,50,000 Hz and 200 – 2,00,000 Hz Arrange the above data in tabular form by giving suitable heading.

Answer:
Your are correct if your table is.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Animal</th>
<th>Audible range of sound (Hetrz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elephant</td>
<td>16 – 12,000</td>
</tr>
<tr>
<td>2</td>
<td>Human being</td>
<td>20 – 20,000</td>
</tr>
<tr>
<td>3</td>
<td>Rodents (Rat, squirrel, Rabbit)</td>
<td>1000 – 1,00,000</td>
</tr>
<tr>
<td>4</td>
<td>Bat</td>
<td>1000 – 1,50,000</td>
</tr>
<tr>
<td>5</td>
<td>Sea lions</td>
<td>200 – 2,00,000</td>
</tr>
</tbody>
</table>

POST TEST ACTIVITIES

ACTIVITY -1

The molecular formula of some compounds sulphur dioxide, sulphur trioxide, Hydrogen sulphide, carbondi sulphide and carbon dioxide are SO₂, SO₃, H₂S, CS₂ and CO₂ respectively. Arrange the above data in tabular form by giving suitable heading.

ACTIVITY -2

The percentage of carbon in peat, Lignite, Bituminous and Anthracite are 60%, 70%, 78% and 90% arrange the above data in tabular form by giving suitable heading.
ACTIVITY -3

The mass number of Hydrogen (H), Carbon (C), Oxygen (O), Sodium (Na), Chlorine (Cl) and Calcium (Ca) are 1, 12, 16, 23, 35 and 40 respectively. Arrange the above data in tabular form by giving suitable heading.

SKILL – 13 DRAWING

OBJECTIVE:
Students able to draw the diagram of the observed given specimens, materials, apparatus and instruments correctly.

ACTIVITY -1

You are provided with the experimental set up for Inertia of rest draw the diagram.

You are correct if your diagram is like this.

ACTIVITY -2

You are provided with a mercury thermometer. Draw the structure and write various temperature ranges on the thermometer.

You are correct if your diagram is like this.

ACTIVITY -3

You are provided with an experimental setup of sound requires a medium for propagation draw the same.

You are correct if your diagram is like this.

POST TEST ACTIVITIES

ACTIVITY -1

You are provided a simple pendulum. Observe carefully how a simple Pendulum is swing and draw the diagram.
ACTIVITY -2

You are provided with a tuning fork. Draw the diagram.

ACTIVITY -3

You are provided with a brinjal draw the diagram.

SKILL -14 GRAPHICAL REPRESENTATION

OBJECTIVE:

Students able to make graphical representation of the given experimental data.

ACTIVITY -1

Sonometer is a hollow wooden sound box. Plot a graph by keeping the weights in the weight Hanger in x-axis and string Tension in y-axis, given in the table.

Answer:

You are correct if your graphical representation is follow.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Weight Kg</th>
<th>Tension T(N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>9.8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>19.6</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>29.4</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>39.2</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>49.0</td>
</tr>
</tbody>
</table>
ACTIVITY -2 Bar diagram

The efficiency of an automobile is 15%. So, 85% of the energy is wasted due to friction and insufficient cooling. Draw a bar diagram for the efficiency of different engines are given in the table. Take type of engines in X-axis and efficiency in Y-axis.

**Answer:**

You are correct if your graphical representation is follow.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Type of Engine</th>
<th>Efficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Steam engine</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Steam turbine</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>Petrol engine</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>Diesel engine</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>Jet engine</td>
<td>15</td>
</tr>
</tbody>
</table>

ACTIVITY -3 Line graph

According to charles law. At constant pressure.

\[ V \alpha T \]

Draw a line graph with temperature gas along X-axis and volume of gas along axis for given table.

**Answer:**

You are correct if your graphical representation is follow.
POST TEST ACTIVITIES

ACTIVITY -1

Velocity of sound is more in solids. Draw a bar diagram with different solids along X-axis and corresponding velocity along y-axis given in the table.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Solid</th>
<th>Velocity (ms⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aluminium</td>
<td>5100</td>
</tr>
<tr>
<td>2</td>
<td>Steel</td>
<td>5000</td>
</tr>
<tr>
<td>3</td>
<td>Granite</td>
<td>6000</td>
</tr>
<tr>
<td>4</td>
<td>Glass</td>
<td>5000</td>
</tr>
<tr>
<td>5</td>
<td>Wood</td>
<td>3850</td>
</tr>
</tbody>
</table>

ACTIVITY -2

The element names and mass numbers (A) are given in the table. Plot a graph by keeping element names in X-axis and mass number (A) in Y axis.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Element Name</th>
<th>Mass Number (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nitrogen (N)</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Oxygen (O)</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Aluminium (A)</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>Sodium (Na)</td>
<td>23</td>
</tr>
<tr>
<td>5</td>
<td>Sulphur (S)</td>
<td>32</td>
</tr>
</tbody>
</table>

ACTIVITY -3

The Simple Pendulum is set up for a different length and time taken for 20 oscillations are given in the table. Plot a graph by keeping length in X-axis and time in Y-axis.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Length (l) m</th>
<th>Period T (S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70</td>
<td>21</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>90</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>110</td>
<td>28</td>
</tr>
</tbody>
</table>
SKILL – 15 INTERPRETATION

OBJECTIVE:
Students able to interpret the data or a creative work.

ACTIVITY – 1

Let A and B represent two cities at a distance of 800 km through a straight line road and 1200 km through a circuitous road. Observe carefully and give your interpretation for the following questions.

Questions:
1. What is Distance?
2. What is Displacement?

Answer:
1. Length of the straight line actual path travelled by a body is called distance. It is scalar. It has no direction.
2. The distance between initial and final position of a body in a specific direction is called displacement. It is a vector. It has both magnitude and direction.

ACTIVITY – 2

Observe carefully the isomerism of different structure of two compounds ethonal and Dimethyl ether. Give your interpretation for the following questions.

Questions:
1. Define isomerism.
2. What is the main difference between these two compounds.

Answer:
1. Isomerism is the existence of two or more compounds with the same molecular formula but different structural formula.
2. Hydroxil group (OH) is present in ethanol, not in dimethyle ether.
ACTIVITY – 3

Observe the graphical representation carefully and give your interpretation for the following questions.

Questions:
1. Explain instantaneous velocity using a graph?
2. Derive the equation of instantaneous velocity.

Answer:
1. The velocity of an object in motion at an instant or at a point (C) is called instantaneous velocity.
2. Instantaneous velocity (V) = \frac{\text{Displacement}}{\text{Time}} = \frac{BD}{AD}
   \therefore V = \frac{\Delta Y}{\Delta t}

POST TEST ACTIVITIES

ACTIVITY – 1 NEWTON’S THIRD LAW OF MOTION

Observe carefully a man jumps from a boat floating on water. According to Newton’s 3rd Law. Give your interpretation for the following questions.

Questions:
1. Explain action and reaction.
2. Give the relation between action and reaction.

ACTIVITY – 2 INERTIA OF REST AND MOTION

Observe carefully what happens the passengers when sudden start and sudden stop of Bus. Give your interpretation.

Questions:
1. What happens when a moving bus suddenly stops?
2. What happens when the bus suddenly starts from rest?

ACTIVITY – 3 SOUND REQUIRES A MEDIUM FOR PROPAGATION

An electric bell is operated inside a bell jar. To reduce the air pressure in the jar, a vacuum pump is connected to it. Give your interpretation for the following questions.

Question:
1. Sound requires a medium for propagation explain?