

NEW NORMAL CURRICULUM

Instructional Guide

General Science

Class VII



Royal Education Council

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Curriculum Development Centre
Royal Education Council
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Advisors:

Mr Kinga Dakpa, Director General, Royal Education Council (REC)

Mr Wangpo Tenzin, Dean, Curriculum Development Centre, REC

Research and Writing:

Mr Bhoj Raj Rai, Curriculum Specialist, STEM Unit, REC

Mr Wangchuk, Curriculum Developer (CD), STEM Unit, REC

Mr Phuntsho Norbu, CD, STEM Unit, REC

Mr Karma Dorji, CD, STEM Unit, REC

Mr Jigme Tenzin, Teacher, Doteng Lower Secondary School (LSS), Paro

Mr Dendup Wangdi, Teacher, Tshaphel LSS, Haa

Mrs Pema Yangki, Teacher, Woochu LSS, Paro

Mrs Dorji Wangmo, Teacher, Woochu LSS, Paro

Mr Ugyen Tshering, Teacher, Bajothang Higher Secondary School
(HSS), Wangduephodrang

Mr Phuntsho Wangchuk, Teacher, Lobesa LSS, Punakha

Mr Khenrab Jamphele, Teacher, Bjibjokha LSS, Punakha

Mr Wangchuk, Teacher, Kabesa Central School, Punakha

Copy Editor:

Mr Ugyen Lhendup, CD, Vocational and Commercial Studies Unit, REC

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FOREWORD

COVID-19 has suddenly caused unforgiving disruptions in the public education all over the world, and brought about threats of fragmentation due to disparities in accessibility and connectivity in many systems. In Bhutan too, continuity of education and learning has been severely affected as a result of nationwide school closures and due to restrictions and health protocols. The disruptions have led to challenges in many existing patterns and trends in education resulting in a massive shift away from learning and teaching in traditional settings with physical interactions to the maximum in terms of relevancy and efficiency. This has caused a major problem for children living in poverty worldwide, who often rely on the physical settings of their schools for educational materials, guidance, and, sometimes, the only decent meal of the day.

In the new normal education, human interaction and well-being is a priority. Technology, particularly digital technology that enables communication, collaboration and learning across distance, is a formidable tool – not a panacea but a source of innovation and expanded potentials. As we embrace this exceptional opportunity to transform the world, and as we reimagine the organization of our educational institutions and learning environments, we will need to think about where we want to go.

In the post COVID 19 era, we must prioritize the development of the whole person not just academic knowledge. Inspiration for the change can be drawn from the 1996 Delors report, *Learning the treasure within*, in its specification of four pillars of learning as “learning to know”, “to do”, “to be”, and “to live together”. Therefore, curricula must be increasingly perceived as an integrated and based on themes and problems that allows learners to learn to live in peace with our common humanity and our common planet. This has the potential in the development of a strong base of knowledge about one’s self and about the world and find purpose and be better able to participate in social and political milieu.

The New Normal Curriculum is, not just a mere response to the pandemic, but also a culmination of the curriculum reform work for the last four years by the Royal Education Council. It is an attempt to transform education from the teaching of “what” to learning of “how” and “why” towards empowering learners with the transversal competencies and the 21st century skills, and preparing them to be lifelong learners. We are optimistic that this move orients our education process towards nurturing nationally rooted and globally competent citizens.

Wish all our learners and teachers a life enriching experiential teaching and learning.

(Kinga Dakpa)
DIRECTOR GENERAL

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The REC also genuinely acknowledges the retrieval and use of contents and resources, either in part or whole, from relevant websites and other forms of sources. Moreover, the REC reassures that these resources will exclusively be used for the educational or learning purposes.

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INTRODUCTION

The science education in Bhutan was started with the introduction of modern education. Starting 1986, the Royal Government of Bhutan (RGoB) replaced this curriculum by implementing a localised science curriculum founded on the principles of New Approach to Primary Education (NAPE). Since then, Bhutanese science curriculum witnessed several episodes of changes, including the refinement of, and changes to, theories, ideas, and beliefs over time. Therefore, the current context of Bhutanese science curriculum is shaped by several rounds of initiatives undertaken over the past several decades.

Conversely with the dawn of the 21st century, nations around the world were confronted with wide arrays of unique real-world problems, such as social, economical, and environmental challenges. In light of such changing dynamics, the global education system, including Bhutan embraced 21st century educational framework as the new conceptual windows of education. The national aspirations of Bhutanese curricula, including science curriculum are thus anchored on the principles of 21st century educational paradigm. As such, the Royal Education Council (REC) initiated science curriculum reform towards the fall of 2020. Thus, the New Normal Curriculum in Science (NNCS) is largely couched upon the premise of providing competency-based learning experiences, performance-based assessment, and unique arrays of learning platforms.

Categorically, the NNCS aspires to augment the spirit of STEM education. As it is the case, the NNCS now entails transitioning teaching learning from a silo-based approach to 21st century science, technology, engineering, and mathematics (STEM) interdisciplinary approach. Indeed, it now raises the stake of connecting scientific content and scientific process in forming science standards and making the standards of engineering design at par with science standards. Therefore, the instructional practices are largely expected to be delivered in conjunction with other STEM disciplines tied with real-life

authentic contexts to address contemporary social, economic, environmental and inequity issues. To realise this aspiration, the NNCS highlights paradigm shift from:

1. teaching many isolated facts towards teaching fundamental or disciplinary core ideas in science (life science, physical process, and everyday materials).
2. teaching disciplinary core ideas and scientific processes together towards the construction and generation of scientific knowledge and ideas to inform their action.
3. raising the standards of engineering design process/design challenge at par with the science standards.
4. infusing technological design wherever appropriate to augment science standards and engineering design.

As NNCS set a new vision in science, the need of having a guide-like document was deemed necessary. This instructional guide (IG) was thus contrived with the underlying aspiration of assisting both teachers and learners in situating robust and heralding classroom practices. The IG contains suggestive learning experiences drawn from the elements of New Normal Curriculum Framework in Science (NNCFS). Therefore, IG contains suggestive lesson-like learning experiences contrived for each learning objective closely tied to a topic, competency, theme, and strand.

Specifically, each lesson-like learning experience contains suggestive approaches in carrying out both contact and non-contact teaching with definitive roles of both teachers and learners. Colloquially, the contact teaching parts are expected to be carried out during normal teaching days, while non-contact teaching parts are expected to be carried out in times of prolonged closure of schools (due to emergency situations), holidays, and when subject teachers are on leave or away for official duties. However, non-contact teaching parts can also be used in place of the contact teaching wherever possible. Besides, each contact and non-contact teaching part is closely followed by suggestive assessment techniques and tools purported in assessing learners' learning competency or performance tasks. Each learning

experience thus contains learning objectives closely linked with contact and non-contact teaching parts; and assessment techniques and tools in continuous thread-like manner.

Depending on the nature of the learning objective, each learning experience is driven either by the spirit of scientific inquiry or engineering design process. Additionally, one might also come across specific inquiry-derived pedagogical approaches as well. Besides, both contact and non-contact teaching contain learning experiences that are closely woven within the framework of blended learning approaches, such as flip class, virtual enriched model, etc. Therefore, learning experiences contain prolific or sporadic use of digital contents and digital platforms wherever appropriate. Concurrently, NNCS strives to de-emphasise prevailing science textbooks. Therefore, while carrying out classroom instructional practices teachers are expected to curate or develop their own content or core ideas. However, one may use a textbook as one of the references.

STRAND: LIFE SCIENCE

1. Cells

Competencies:

Explain that organisms are made up of cells with evidence and explore the structural difference of plant and animal cells through investigation to recognise their significance in survival.

1.1 Types, structures and functions

(Scope: concepts [cell as building blocks of life, shape and size of cells, structures and organelles of plant and animal cell] activities [observe plant and animal cell, prepare temporary slide]).

Objective (s):

- i. Explain the significance of cells and the cell organelles in survival and functioning of living organisms.
- ii. Examine the structural differences between plant and animal cells by observing the permanent slides using a compound microscope.
- iii. Demonstrate the structural differences between plant and animal cells by designing a model of animal and plant cell.
- iv. Prepare a temporary slide of a plant cell to observe the structure of the plant cells.

Learning Experiences:

- **Contact:** The teacher may use the 5E (Engage, explore, explain, elaborate and evaluate) model to deliver this lesson. The teacher asks questions 'What materials are required to build a wall? What is our body made up of?'
 - ✓ The learner explores the structure of animals and plants cells by observing the permanent slides provided by the teacher under the microscope. The learner also uses the apps such as 'Cell World', 'Cell organelles and '3DCell organelles' to explore the structure of plant and

animal cells to correlate with the structure of cells observed in slides provided by the teacher.

- ✓ The learner designs a model (illustrations/physical/3D) of animal and plant cells to explain the structure of plant and animal cells.
 - ✓ The learner prepares a temporary slide of a plant cell and observes the structure under the microscope to verify the observation made in the slide provided by the teacher.
 - ✓ The learner compares and contrasts the structure of an animal and plant cell based on the observations from the activities carried out.
- **Non-contact:** The teacher may use guided inquiry to deliver the lesson. The teacher asks the learner “How is animal cell structurally different from plant cell?”
 - ✓ The learner explores the structure of the plant and animal cells using apps such as *Cell World*, *Cell organelle*, and *3D organelles* to describe the structure of plants and animal cells.
 - ✓ The learner designs a model (illustration/3D) of animal and plant cells to explain the structural differences of plant and animal cells.
 - ✓ The learner submits the work through Google Classroom and incorporates the feedback provided by the teachers.

Assessment:

- **Contact:**
 - ✓ The teacher may use question answer technique to assess the learner on the ability to state significance of cell in living organism, and ability to compare and contrast (through models) between animal and plant cell. The teacher may assess the observation skill, handling of equipment, management of information and creativity by observing the task performed by the learner. The teacher may design the marking scheme, rubrics or checklist to assess the learner and provide necessary intervention.

- **Non-contact:**
 - ✓ The teacher may use a quiz to assess the learner on the ability to state significance of cell in living organism, and ability to compare and contrast (through models) between animal and plant cell. The teacher may assess the information management skill and creativity skill.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- Apps: Cell world, Cell organelles, 3D cell organelles

2. Humans as Organisms

Competencies:

Investigate the significance of nutrition, health, organ systems and their role in humans, to recognise the proper growth and development.

2.1 Nutrition

(Scope: concept [nutrients and nutrition, carbohydrates, fats, proteins, minerals, vitamins, water, roughage] activities [identifying foods containing carbohydrates, fats and proteins])

Objective(s):

- i. Explain the significance of nutrition for the proper growth and development of a human body.
- ii. Explain the use of various food groups for a healthy lifestyle.
- iii. Explain the role of a balanced diet in maintaining a healthy body through an activity.
- iv. Test the presence of carbohydrates, fats and proteins in food samples.

Learning Experiences:

- **Contact:** The teacher may use guided inquiry to deliver this lesson.
 - ✓ The teacher may pose, “What is the significance of nutrition for the proper growth and development of a human body?”
 - ✓ The learner explores the different types of food group, and significance of a balanced diet for a healthy lifestyle from the appropriate sources.
 - ✓ The learner investigates the presence of carbohydrates, fats and proteins from the food samples provided by the teacher to identify them into different groups of food.
 - ✓ The learner explains the importance of a balanced diet in maintaining a healthy body and healthy lifestyle based on information gathered from investigations and exploration.

- **Non-contact:** The teacher may use guided inquiry to deliver this lesson. The teacher may pose, “What is the significance of nutrition for the proper growth and development of a human body?”
 - ✓ The learner explores the different types of food group, and significance of a balanced diet for a healthy lifestyle from the appropriate sources.
 - ✓ The learner explores and classifies the list of food provided by the teacher into different groups (Fat, Carbohydrate and protein) based on information gathered from the exploration.
 - ✓ The learner prepares an advertisement poster on the importance of a balanced diet in maintaining a healthy body and healthy lifestyle based on information gathered and post it through the Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the understanding of the significance of nutrition, the use of various food groups for a healthy lifestyle, the role of a balanced diet and ability to classify the food sample into carbohydrates, fats and proteins by using question answer technique and checklist. Assess the scientific skills such as information gathering skills, planning, data analysis and data interpretation skills by observing the task performed by the learner. The teacher may develop rubrics.
- **Non-contact:**
 - ✓ Assess the understanding of the significance of nutrition, the use of various food groups for a healthy lifestyle, the role of a balanced diet in maintaining a healthy body and information management skill, creativity from the poster by using rubrics. Provide necessary intervention based on the task.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

2.2 Movement:

(Scope: Concept on human skeleton and functions, activity on labelling skeleton).

Objective(s):

- Explain the importance of skeleton in carrying out day-to-day activities through observation and information from reliable resources.
- Identify to label different parts of the human skeleton through the use of a human skeleton model.

Learning Experiences:

- **Contact:** The teacher may use an inquiry method to deliver this lesson. The learner observes the model of the human skeleton provided by the teacher and names the parts of the human skeleton.
 - ✓ The learner explores the importance of the skeletal system in carrying out the day-to-day activities from the internet.
 - ✓ The learner labels the parts (bones of axial and appendicular skeleton) in a worksheet of the human skeleton provided by the teacher.
- **Non-contact:** The teacher may use an inquiry method to deliver this lesson through the Google Classroom. The teacher asks the learner to explore the importance of the skeleton system in carrying out the daily activities from the internet.
 - ✓ The learner explores the importance of the skeletal system in carrying out the day-to-day activities from the video link <https://www.youtube.com/watch?v=QJwORUokEXc>.

- ✓ The learner labels parts of the skeleton (bones of axial and appendicular skeleton) in the worksheet provided by the teacher based on the information gathered from the video link.

Assessment:

- **Contact:**

- ✓ Assess the learner's ability to state the importance of the skeleton, identify and label the parts of skeleton, observation skill and information management skill through the worksheet using rubrics/checklist. Provide necessary intervention.

- **Non-contact:**

- ✓ Assess the learner's ability to state the importance of skeleton, identify and label the parts of skeleton, observation skill and information management skill through the worksheet using rubrics/checklist.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=QJwORUokEXc>

2.3 Breathing and Respiration

(Scope: concept on breathing and respiration, identify parts of the respiratory system and their functions).

Objective(s):

- Identify parts of the human respiratory system and their role in the normal functioning of human beings.
- Explain the mechanism of breathing by developing a model of the human respiratory system.

Learning Experiences:

- **Contact:** The teacher may use the following order of scientific inquiry.
 - ✓ The learner explores relevant sources (book, weblink, videos) and explores information on parts of the human respiratory system and their role in normal functioning of human beings.
 - ✓ The learner develops a model (illustration/3D/physical) of the human respiratory system to explain the mechanism of breathing based on the information gathered.
 - ✓ The learner presents their model to the class and incorporates the feedback received from the peers if any to modify the model.
- **Non-contact:** The teacher may use a KWL (What you know, what you want to know, What you have learned) method to deliver this lesson through Google Classroom.
 - ✓ The learner lists down the information about breathing and respiration from their experiences and prior knowledge.
 - ✓ The learner writes down what they want to know about breathing and respiration and post in Google Classroom.
 - ✓ The learner lists down the parts of the respiratory system and their functions in tabular form based on information gathered from the video link https://www.youtube.com/watch?v=F5O-Ax5keiM&list=TLPQMwMjIwMjGCUSP0Kt_NpQ&index=2.

Assessment:

- **Contact:**
 - ✓ Assess the learner's conceptual understanding of the mechanism of breathing, ability to identify and write their role in the normal functioning of human beings, information assimilation skill, planning skill and ability to accommodate the feedback through observation/presentation of the model and using rubrics/checklist.

- **Non-contact:**
 - ✓ The teacher may conduct online tests/quizzes through Google Classroom to check conceptual understanding of the human respiratory system, their role in the normal functioning of human beings and the mechanism of breathing.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- https://www.youtube.com/watch?v=F5O-Ax5keiM&list=TLPQMwMjIwMjGCUSP0Kt_NpQ&index=2

2.4 Reproduction

(Scope: concept on different parts of male and female reproductive systems, menstrual cycle and activity to promote health and hygiene during menstruation).

Objective(s):

- Explain the role of different parts of male and female reproductive system to relate their significance in daily life.

Learning experiences:

- **Contact:** The teacher may use gallery walk to deliver this lesson:
 - ✓ The learner explores the role of male and female reproductive system from the web link
<https://happylearning.tv/en/the-reproductive-system/>.
 - ✓ The learner (in team) prepares an illustration showing the parts of the male and female reproductive system and places the charts in a designated area.

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://happylearning.tv/en/the-reproductive-system/>.
- https://youtu.be/QkqDoF9KK60?list=TLPQMDMwMjIwMjGCUSP0Kt_NpQ

Objective(s):

ii. Describe the phases of the menstrual cycle to understand the significance of each phase.

Learning Experiences:

- **Contact:** The teacher may use Think, Puzzle, Explore pedagogy to deliver this lesson. The teacher pose “Why does menstruation occur? What is the significance of each phase of the menstrual cycle?”
 - ✓ The learner shares what they already know about menstruation with their peers.
 - ✓ The learner explores the phases of the menstrual cycle to understand the significance of each phase and ways to promote health and hygiene during menstruation from the relevant sources.
 - ✓ The learner prepares a presentation using charts or powerpoint to describe the phases of the menstrual cycle, the significance of each phase and the ways to promote health and hygiene during menstruation.
- **Non-contact:** The teacher may use guided inquiry to deliver this lesson. The teacher pose “Why does menstruation occur? What is the significance of each phase of the menstrual cycle?”
 - ✓ The learner explores the phases of the menstrual cycle to understand the significance of each phase and ways to promote health and hygiene during menstruation from the video links (<https://www.youtube.com/watch?v=P7Mcv5v4RvM> and , <https://www.youtube.com/watch?v=tOluxtc3Cpw&t=338s>).

- ✓ The learner creates a presentation using powerpoint on the significance of each phase in the menstrual cycle and also on ways to promote health and hygiene during menstruation from the information gathered from the video links and share it on Google Classroom.

Assessment:

- **Contact:**

- ✓ Assess the learner on information management skills, creative thinking skill, critical thinking skills and the conceptual understanding of significance of each phase in the menstrual cycle and ways to promote health and hygiene during menstruation based on the presentation prepared. The teacher may design their own rubrics to assess the task and provide necessary intervention.

- **Non-contact:**

- ✓ Assess the learner on information management skills, creative thinking skill, critical thinking skills and the conceptual understanding of significance of each phase in the menstrual cycle and ways to promote health and hygiene during menstruation based on the presentation prepared. The teacher may design their own rubrics to assess the task and provide necessary intervention.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=tOluxtc3Cpw&t=338s>
- <https://www.youtube.com/watch?v=P7Mcv5v4RvM>

2.5 Nervous System

(Scope: concept of brain, spinal cord, nerve, and activity to recognise and remember)

Objective(s):

- i. Identify the parts of the human nervous system and their functions through reliable resources and use of human brain model.
- ii. Explore different types of nerves and their function to understand their role in the nervous system.

Learning Experiences:

- **Contact:** The teacher may use the following order of scientific inquiry.
 - ✓ The learner explores the information on parts (brain, spinal cord and nerves) of the human nervous system and their functions from a reliable source.
 - ✓ The learner explores the different types of nerves (sensory, motor and mixed nerves) and their function to comprehend their role in the nervous system from the link <https://byjus.com/biology/nerves/>
 - ✓ The learner identifies and writes the parts and the function of the brain and the different types of nerves based on the information gathered and activity carried out from the given link in the tabular form or model (illustration).

- **Non-contact:** The teacher asks the learner to explore the information on the brain, spinal cord and nerves and on different types of nerves viz sensory, motor and mixed nerves of the human nervous system.
 - ✓ The learner explores the information on parts of the human nervous system and their functions from a reliable source.
 - ✓ The learner explores the different types of nerves and their function to comprehend their role in the nervous system from the link <https://byjus.com/biology/nerves/>
 - ✓ The learner identifies and writes the parts and the function of the brain and the different types of nerves based on the information gathered

and activity carried out from the given link in the tabular form or model (illustration) and submitted on Google Classroom.

Assessment:

- **Contact:**

- ✓ The teacher may use rubrics to assess the learner's scientific knowledge on the parts and the functions of the brain and nerves and interpret scientific information gathered from reliable sources.

- **Non-contact:**

- ✓ The teacher may use rubrics to assess the learner's scientific knowledge on the parts and the functions of the brain and nerves and interpret scientific information gathered from reliable sources.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://byjus.com/biology/nerves/>

2.6 Health

(Scope: concept [communicable diseases, and non-communicable diseases], different diseases [cause, symptom, and prevention]).

Objective(s):

- Explain different communicable and non-communicable diseases to examine their occurrence in the locality.
- Explain different ways of preventing the spread of communicable diseases by designing a poster using programming language.

Learning Experiences:

- **Contact:** The teacher may use scientific inquiry to deliver this lesson
 - ✓ The learner explores the information on communicable and non-communicable diseases from a reliable source.
 - ✓ The learner plans and conducts a survey in their locality for the prevalence of communicable and noncommunicable diseases.
 - ✓ The learner analyzes the data gathered from surveys and triangulates the data with information explored from the relevant sources on causes, symptoms and preventions.
 - ✓ Learner designs a poster using *Scratch* programming to create awareness on the communicable and non-communicable diseases and presents to the class.

- **Non-contact:** The teacher may provide video on causes, symptoms and preventive measures of communicable and noncommunicable diseases recorded in any video recording software (camtasia/premier pro) through the Google Classroom.
 - ✓ The learner designs a poster using *scratch* programming to create awareness on communicable and non-communicable diseases using the information from the video provided by the teacher and submit it through Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the learner's ability to mention different types of communicable and non-communicable diseases, the causes, symptoms and preventions of those diseases using appropriate rubrics/checklist. Assess information management skill, scientific investigation skill, collaboration skill, scientific values and attitudes by using observation and rubrics. Provide necessary intervention to the learner based on responses from the learner.

- For recording and reporting, refer to New Normal Science Curriculum Framework.

- **Non-contact:**
 - ✓ The teacher may use rubrics to assess the conceptual understanding of communicable and noncommunicable diseases, information management skill and creativity from the poster designed by the learner.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021).

3. Green Plants

Competencies:

Investigate the ways through which the plants obtain nutrition, carry out respiration and reproduction to provide right conditions for proper growth of a plant.

3.1 Photosynthesis and Nutrition

(Scope: concept [photosynthesis with equations, primary and secondary nutrients] and activities [opening in leaves, requirement of light and carbon dioxide, production of gas during photosynthesis, micronutrients and deficiency symptoms, deficiency of primary nutrients]).

Objective (s):

- i. Explain the importance of photosynthesis to understand its role in plant survival.
- ii. Investigate the conditions necessary for photosynthesis to take place.

Learning Experiences:

- **Contact:** The teacher may use the following order of scientific inquiry to deliver this lesson:
 - ✓ The learner explores information on the importance of photosynthesis, its role in plant survival and the conditions necessary for photosynthesis to take place from reliable sources.
 - ✓ The learner plans and carries out an experiment to investigate the conditions necessary for photosynthesis to take place.
 - ✓ The learner analyzes the data gathered from the experiment to explain the factors necessary for photosynthesis.
 - ✓ The learner prepares a presentation to explain the importance of photosynthesis and its role in plant survival based on information and data gathered.

- **Non-contact:** The teacher may provide the video on importance of photosynthesis from the web link <https://youtu.be/UPBMG5EYyd> and the video on the conditions necessary for photosynthesis to take place from the web link <https://www.youtube.com/watch?v=e6DbE41CKfc>
- ✓ The learner notes down the importance of photosynthesis, its role in plant survival and the conditions necessary for photosynthesis to take place based on information from the video links and submit the work through any reliable media.

Assessment:

- **Contact:**
 - ✓ Assess the learner's observation skill, collaboration skill and scientific knowledge on the process of photosynthesis, and the scientific values and attitudes from the task performed by the learner using appropriate tools (rubrics). Provide intervention based on the response from the learner.
- **Non-contact:**
 - ✓ Assess the learner's information assimilation skill, interpretation skills and scientific knowledge based on the work submitted by the learner through Google Classroom using appropriate tools (Scoring). Provide intervention based on the response from the learner.
- For recording and reporting, refer New Normal Curriculum Framework of Science (2021).

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021).
- <https://youtu.be/UPBMG5EYyd>
- <https://www.youtube.com/watch?v=e6DbE41CKfc>

Objective (s):

- iii. Explore the role of nutrients in proper growth and development of a plant by relating it to their observation from the locality.

Learning Experiences:

- **Contact:** The teacher may deliver the lesson through a field trip:
 - ✓ The learner plans a field trip to study the role of nutrients in proper growth and development of plant in the locality.
 - ✓ The learner observes a number of plants of the same species and compares their physical appearance.
 - ✓ The learner takes notes on the variations among plants of the same species of two different places.
 - ✓ The learner carries out soil test for both the places and compare and contrast the nutrients.
 - ✓ The learner explores the additional information on nutrients necessary for proper growth of plants from relevant sources.
 - ✓ The learner reports the findings in tabular or pictorial form based on data triangulation on field trip reports and information explored from different sources.
 - ✓ The learner infers the importance of primary and secondary nutrients for proper growth of plants based on field trip reports and information gathered.

- **Non-contact:** The teacher may deliver this lesson using available online materials (Youtube videos, images, illustrations etc.) or may provide handouts about nutrients and their deficiency symptoms in plants via any online media.
 - ✓ The learner writes the importance of primary and secondary nutrients for proper growth of plant based on the information gathered from the materials provided by the teacher and submits it through Google Classroom.

Assessment:**• Contact:**

- ✓ Assess the learner on scientific knowledge on importance of primary and secondary nutrients, Scientific skills such as observation skill, data analysis, data interpretation skill and communication skills using appropriate tools (rubrics) through field trip reports. Provide necessary feedback and intervention as per the need.

• Non-contact:

- ✓ Assess the information management skill and scientific knowledge based on the work submitted by the learner through Google Classroom using appropriate tools (Scoring). Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021).

3.2 Respiration

(Scope: concept [respiration and its types] and activities [gas used and produced during respiration]).

Objective(s):

- i. Investigate to explain the significance of respiration in growth and development of plants.

Learning Experiences:

- **Contact:** The teacher may use scientific investigation to deliver this lesson.
 - ✓ The learner explores the concepts and the types of respiration from any relevant sources (Internet, books handouts)

- ✓ The learner formulates questions, conducts background research, generates hypotheses and plans an investigation on respiration in plants.
 - ✓ The learner carries out an experiment, gathers data, records observations, analyzes and organizes data gathered from the experiment on gas used and produced during respiration.
 - ✓ The learner draws a conclusion, makes inferences, applies findings to explain the gas used and produced during respiration and significance of respiration for growth and development of plants.
 - ✓ The learner differentiate between two types of respiration based on the information gathered and analyzed data from the experiment.
- **Non-contact:** The teacher may provide the link <https://www.youtube.com/watch?v=rvro5V89nE> on respiration of plants.
 - ✓ The learner prepares an animated video using any programming language or presentation software on anaerobic respiration based on information in video.
 - ✓ The learner shares their work in Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the learner on comprehension of types of respiration, gas used and produced during respiration, significance of respiration by observing while they perform the experiment. Assess the information assimilation skill, scientific inquiry process (hypothesizing, data gathering and analysis, data interpretation and communicating inferences) and scientific attitudes and values such as curiosity and honesty. The teachers may use observation form to assess and record the progress and provide necessary intervention.

- **Non-contact:**
 - ✓ Assess information management skill, critical thinking skill, creativity skill and conceptual understanding of the types and significance of respiration based on the animated video prepared using any programming language or presentation software on anaerobic respiration. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=rvaro5V89nE>

3.3 Reproduction

(Scope: concept, types, and activities to investigate germination and the conditions required).

Objective(s):

- Explore the conditions required for germination of seeds through investigation to apply the concept in daily life.

Learning Experiences:

- **Contact:** The teacher may deliver this lesson through guided inquiry:
 - ✓ The learner may be asked: ‘What are the conditions required for germination of seeds? How is epigeal germination different from hypogeal germination?’
 - ✓ The learner explores information on the conditions required for germination of seeds and the types of germination through relevant resources.

- ✓ Based on the information gathered the learner plans and carries out an experiment to investigate the conditions required for germination of seed and to demonstrate epigeal and hypogeal germination.
 - ✓ The learner analyses and interprets the data obtained from the investigation and shares the findings to the class.
- **Non-contact:** The teacher may provide a video link <https://www.youtube.com/watch?v=EDADxVr9Mng> on conditions required for germination of seeds and link on hypogeal and epigeal germination <https://www.youtube.com/watch?v=U-Djrry8gXc>.
 - ✓ The learner explores the information on conditions required for germination and types of germination from the video links provided and notes it down and submit the work on Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the information management skill, scientific investigation skill, collaboration skills and scientific values and attitudes through observation of the experiment being carried out. Assess the scientific knowledge and communication skill through the presentation done by the learner by using relevant tools (rubrics). Provide necessary intervention.
- **Non-contact:**
 - ✓ Assess the learner on information management skills and scientific knowledge based on the work submitted by the learner through the Google Classroom using rubrics. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=EDADxVr9Mng>
- <https://www.youtube.com/watch?v=U-Djrry8gXc>.

4. Living things and their Environment

Competencies:

Explain how organisms adapt and obtain food from an environment to maintain an ecosystem to develop an understanding of the interdependence of living things and their environment.

4.1 Adaptation and Variation

(Scope: concept on adaptation and variation, and activities [identifying adaptive features, and understanding variations]).

Objective(s):

- i. Explore how different habitats support a diverse range of plants and animals through field visits.
- ii. Explain the role of environmental factors in the creations of a variety of species.
- iii. Identify the animals based on their adaptive features.
- iv. Compare the features of the same animal species to understand their variation.

Learning Experiences:

- **Contact:** The teacher may use the jigsaw method to deliver this lesson.
 - ✓ The teacher divides the class into teams (home team) and provides the following topics to explore on:
 - i. habitats of plants and their adaptive features.
 - ii. habitats of animals and their adaptive features.
 - iii. role of environmental factors in creation of a variety of species.
 - iv. variations in animals and plants.
 - ✓ The learner forms an expert team and plans and carries out a field trip to explore habitats of plants and their adaptive features, habitats of animals and their adaptive features, the role of environmental factors in creation of a variety of species and variations in animals of the same species. The learner records their findings in their science journal.

- ✓ The learner from the expert team will go back to their home team and share their findings with the peers and prepare a presentation.
- **Non-contact:** The teacher asks the learner to explore the information on habitat, adaptive features, variations and speciation from any sources.
 - ✓ The learner explores the relevant resources on habitats of plants and animals, their adaptive features, the role of the environment in creating new species and variations in animals of the same species.
 - ✓ Using the information gathered from the relevant resources the learner observes their surroundings and identifies the plants and animals based on their adaptive features, compares the features of the animal of same species to understand their variation and notes down the role of environmental factors in creation of a variety of species in their science journal and submit it through Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the learner on information management skills, collaboration skills and scientific values and attitudes by observing the task being carried out. Assess the communication skill and the conceptual understanding of habitats of plants and animals and their adaptive features, the role of environmental factors in creation of a variety of species and variations in animals and plants through the team presentation. The teacher may design their own rubrics to assess the task. Provide necessary intervention.
- **Non-contact:**
 - ✓ Assess the learner on information management skills, observation skill, and scientific knowledge through the science journal and the teacher may design their rubrics to assess the task. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

4.2 Ecosystems

(Scope: concept on biotic components of an ecosystem, activity on identifying different ecosystems).

Objective (s):

- Describe the role of biotic components in maintaining a healthy ecosystem.
- Investigate different types of ecosystems in the locality to learn their significance.

Learning Experiences:

- **Contact:** The teacher may use 5E (Engage, explore, explain, elaborate and evaluate) model to deliver the lesson. The teacher asks "How are living things in the surrounding related to one another?"
 - ✓ The learner lists the living things in their surroundings and draws the relationship among them.
 - ✓ The learner explores the information on the role of biotic components in maintaining a healthy ecosystem and different types of ecosystems in the locality to learn their significance through reliable sources.
 - ✓ The learner describes the role of biotic components in maintaining a healthy ecosystem.
 - ✓ The learner visits different ecosystems in their locality to investigate the role of biotic components to find their significance in maintaining a healthy ecosystem.
 - ✓ The learner designs a healthy ecosystem through illustration based on findings from the investigation carried out.

- **Non-contact:** The teacher asks the learner to find the characteristics of a healthy ecosystem from reliable sources.
 - ✓ The learner lists the living things in their surroundings and draws the relationship among them.
 - ✓ The learner explores the information on the role of biotic components in maintaining a healthy ecosystem and different types of ecosystems in the locality to learn their significance through reliable sources.
 - ✓ The learner describes the role of biotic components in maintaining a healthy ecosystem through presentation (illustration) and submit it through Google Classroom.
 - ✓ The learner explores different ecosystems to investigate the role of biotic components to find their significance in maintaining a healthy ecosystem from the relevant sources.
 - ✓ The learner designs a healthy ecosystem through illustration based on the information gathered and uploads it via Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the learner on information management skill, critical thinking skill, and scientific knowledge through observation of the investigation being carried out. Assess the conceptual understanding of a healthy ecosystem through the design of a healthy ecosystem with suitable rubrics. Provide necessary intervention.
- **Non-contact:**
 - ✓ Assess the learner on information management skill, critical thinking skill, information gathering skill and scientific knowledge by developing suitable tools (Rubrics) to assess the design of healthy ecosystems submitted through Google Classroom. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

4.3 Feeding and Relationships

(Scope: concept [food chain, food web, and balance in nature] activities [construct food chain, identify feeding relationship, identifying threats to ecological balance due to human activities.]

Objective(s):

- Identify food chains from the food web to realize its significance in the ecosystem.
- Construct a food chain based on the observation from the locality to explain how the food chain balances a good ecosystem.
- Investigate the ways to mitigate the threat caused to ecological balance due to human activities.

Learning Experiences:

- **Contact:** The teacher may use the following order of scientific inquiry to deliver this lesson.
 - ✓ The learner explores the significance of the food chain in the ecosystem, how the food chain balances a good ecosystem and the ways to mitigate the threat caused to ecological balance due to human activities from relevant sources.
 - ✓ The learner constructs a food chain based on the observation from the locality and explains how the food chain balances a good ecosystem.
 - ✓ The learner identifies the food chain from the food web worksheets provided by the teacher. (use the worksheets from [https://www.pinterest.com/search/pins/?q=food%20web&rs=typed&term meta\[\]=food%7Ctyped&term meta\[\]=web%7Ctyped](https://www.pinterest.com/search/pins/?q=food%20web&rs=typed&term%7Ctyped&term%7Ctyped))
 - ✓ The learner uses the link <https://www.youtube.com/watch?v=wXJiHr8jWBs> to explore the

ways to mitigate the threat caused to ecological balance due to human activities and notes it down in their notebook/prepares pamphlets for advocacy.

- **Non-contact:** The teacher asks the learner to explore the information on the attributes of balanced ecosystem and mitigation strategies to combat threats caused by human activities.
 - ✓ The learner explores the significance of the food chain in the ecosystem, how the food chain balances a good ecosystem and the ways to mitigate the threat caused to ecological balance due to human activities from relevant sources.
 - ✓ The learner constructs a food chain using *Scratch* Programming based on the observation from the locality and explains how the food chain balances a good ecosystem.
 - ✓ The learner identifies the food chain from the food web worksheets provided by the teacher.(use the worksheets from [https://www.pinterest.com/search/pins/?q=food%20web&rs=typed&term_meta\[\]=food%7Ctyped&term_meta\[\]=web%7Ctyped](https://www.pinterest.com/search/pins/?q=food%20web&rs=typed&term_meta[]=food%7Ctyped&term_meta[]=web%7Ctyped))
 - ✓ The learner uses the link <https://www.youtube.com/watch?v=wXJiHr8jWBs> to explore the ways to mitigate the threat caused to ecological balance due to human activities and note it down in their notebook and upload via Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the learner on information management skills, creativity skill, critical thinking skills and conceptual understanding of the food chain, food web and their role in maintaining balance in the ecosystem by observing the task being carried out and assess the scientific knowledge on ways to mitigate the threat caused to ecological balance due to human activities through their notebook using rubrics. Provide necessary intervention.

- **Non-contact:**
 - ✓ Assess the learner on information management skills, critical thinking skills and the scientific knowledge on ways to mitigate the threat caused to ecological balance due to human activities through their notebook using rubrics. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- [https://www.pinterest.com/search/pins/?q=food%20web&rs=typed&term_meta\[\]=food%7Ctyped&term_meta\[\]=web%7Ctyped](https://www.pinterest.com/search/pins/?q=food%20web&rs=typed&term_meta[]=food%7Ctyped&term_meta[]=web%7Ctyped)
- <https://www.youtube.com/watch?v=wXJiHr8jWBs>

STRAND: MATERIALS AND THEIR PROPERTIES

1. Grouping and Classifying Materials

Competencies:

- Justify the properties of the states of matters and their interconversion, gas pressure and the diffusion in liquid based on the particle theory to relate them to everyday life.
- Investigate the properties of elements to classify them and draw relationships between their properties and uses in day-to-day life.

1.1 Particle Theory of Matter

(Scope: states of matter, interconversion of matter [melting, freezing, sublimation, solidification, condensation, explanation of gas pressure and diffusion in liquids based on particle theory]).

Objective(s):

- i. Investigate the states of matter based on particle theory.
- ii. Investigate the changes in states of matter, gas pressure and diffusion based on particle theory.

Learning Experiences:

- **Contact:** The teacher may use guided scientific inquiry to deliver this lesson. The teacher asks, 'How are particles arranged in the three states of matter' and 'How does matter change from one form to another based on particle theory'.
 - ✓ The learner explores information on the changes of matter, gas pressure and diffusion based on the particle theory from relevant sources.
 - ✓ The learner uses a PhET simulation to see the interconversion of matter using the (https://phet.colorado.edu/sims/html/states-of-matter-basics/latest/states-of-matter-basics_en.html) and observes, explores

and investigates the properties of matter, gas pressure and diffusion based on particle theory.

- ✓ The learner determines the dependent, independent and controlled variables and analyzes and interprets the data collected from the experiment and provides scientific explanation using the data collected and notes it down in their notebook.
- **Non-contact:** The teacher may use guided scientific inquiry to deliver this lesson. The teacher asks, 'How are particles arranged in three states of matter' and 'How does matter change from one form to another based on particle theory'.
 - ✓ The learner explores information on the changes of matter, gas pressure and diffusion based on the particle theory from relevant sources.
 - ✓ The learner uses a PhET simulation to see the interconversion of matter using https://phet.colorado.edu/sims/html/states-of-matter-basics/latest/states-of-matter-basics_en.html) and observes, explores and investigates the properties of matter, gas pressure and diffusion based on particle theory.
 - ✓ The learner determines the dependent, independent and controlled variables and analyzes and interprets the data collected from the experiment and provides scientific explanation using the data collected and notes it down in their notebook and submits it through Google Classroom.

Assessment:

- **Contact:**
 - ✓ The teacher may use question and answer, quiz, crossword puzzle, DARTs to assess conceptual understanding of states of matter, gas pressure and diffusion based on particle theory. The teacher also assesses information management skills, data interpretation skills, analysing skills by observing the task. A teacher may design rubrics or

rating scale to assess learners and accordingly provide necessary intervention.

- **Non-contact:**

- ✓ Assess the learner's interpretation skill, analyzing skill and conceptual understanding of states of matter, gas pressure and diffusion based on particle theory from the explanation notes submitted through Google Classroom using rubrics. Provide necessary intervention.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- (https://phet.colorado.edu/sims/html/states-of-matter-basics/latest/states-of-matter-basics_en.html)

1.2 Elements and Atomic Structure

(Scope: elements and their symbols; general representation of elements; atomic number, mass number; atomic structure and location of subatomic particles in an atom; concept, properties, and examples of metal and non-metal).

Objective (s):

- i. draw an atomic structure using the concept of elements, atomic number and mass number.
- ii. develop models to describe the atomic composition of atoms of common elements

Learning Experiences:

- **Contact:** The teacher may use scientific inquiry process to deliver the lesson:

- ✓ The learner recalls the concept of an element that the learner had previously learnt to connect to the atomic structure.
 - ✓ The learner explores the information on elements and their symbols; general representation of elements; atomic number and mass number using video link <https://youtu.be/EMDrb2LqL7E>, sketches general representation of elements and explains to the class.
 - ✓ The learner develops a model of an atomic structure of common elements showing the composition of atom based on information gathered from the video and exhibits to the class.
- **Non-contact:** The teacher provides the video link <https://youtu.be/EMDrb2LqL7E> on Google Classroom
 - ✓ The learner recalls the concept of an element that the learner had previously learnt to connect to the atomic structure.
 - ✓ The learner uses the video link provided to study general representation of elements; atomic number and mass number and draws a general representation of elements showing atomic number and mass number and submits the work on Google Classroom.
 - ✓ The learner describes the atomic structure showing composition of atoms of common elements by drawing a diagram.

Assessment:

- **Contact:**
 - ✓ Assess the learner's information gathering skill, analysing skill and scientific knowledge through the model designed by the learner using rubrics. Provide necessary intervention.
- **Non-contact:**
 - ✓ Assess the learner's information gathering skill, analysing skill and scientific knowledge through the work submitted on Google Classroom by using rubrics. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Objective(s):

- i. classify elements as metals and non-metals based on their physical and chemical properties.

Learning Experiences:

- **Contact:** The teacher may use POE (predict, observe and explain) method to deliver the lesson. The teacher provides a list of elements to be segregated into metals and nonmetals based on their physical and chemical properties. The teacher also provides a worksheet to record their predictions and findings.
 - ✓ The learner predicts the list of elements provided by the teacher into metals and nonmetals and writes it down in the worksheet.
 - ✓ The learner explores information on physical and chemical properties of metal and nonmetal through relevant sources.
 - ✓ Based on the information gathered the learner observes and compares the prediction with the findings and makes inferences.
 - ✓ The learner segregates the metals and non-metals based on the findings in the worksheet and shares their findings with their peers using think-pair-share.

- **Non-contact:** The teacher may use POE (predict, observe and explain) method to deliver the lesson. The teacher provides a list of elements to be segregated into metals and nonmetals based on their physical and chemical properties. The teacher also provides a worksheet to record their predictions and findings on the Google Classroom.
 - ✓ The learner predicts the list of elements provided by the teacher into metals and nonmetals and writes it down in the worksheet.
 - ✓ The learner explores information on physical and chemical properties of metal and nonmetal through relevant sources.
 - ✓ Based on the information gathered the learner observes and compares the prediction with the findings and makes inferences.
 - ✓ The learner segregates metals and non-metals based on the findings in the worksheet and shares it on Google Classroom.

Assessment:**• Contact:**

- ✓ Assess the learner's information gathering skill, analysing skill, observation skill and conceptual understanding of the physical and chemical properties of metals and nonmetals based on the worksheets. The teacher may use rubrics to assess the task. Provide necessary intervention.

• Non-contact:

- ✓ Assess the learner's information gathering skill, analysing skill, observation skill and conceptual understanding of the physical and chemical properties of metals and nonmetals based on the worksheets. The teacher may use rubrics to assess the task. Provide necessary intervention.
- For recording and reporting, refer to New Normal Science Curriculum Framework (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

2. Materials and Change

Competency:

Investigate various physical and chemical changes in the locality, through activities to study the properties of the changes.

2.1 Physical and Chemical Change

(Scope: concept, properties, and examples, activity to investigate physical and chemical change).

Objective(s):

- i. Investigate various physical and chemical changes in the locality, through activities to study the properties of the changes.

Learning Experiences:

- **Contact:** The teacher may use predict, observe and explain (POE) to support the concept and properties of physical and chemical change. The teacher provides a list of items that shows the chemical changes and physical changes. The teacher also provides the worksheets to note down their predictions and findings.
 - ✓ The learner explores information on the properties of chemical and physical changes from relevant resources.
 - ✓ The learner predicts whether the changes are physical or chemical and writes their prediction in the worksheet provided by the teacher using the information gathered.
 - ✓ The learner carries out the experiment to sort the list of items into chemical and physical change and notes the observation in the worksheet provided by the teacher.
 - ✓ The learner compares their prediction and the post experiment result and writes the explanation on the worksheets based on observations made during the experiment.
 - ✓ The learner triangulates the information obtained from the experiment and relevant sources to differentiate between physical and chemical changes.

- **Non-contact:** The teacher may use predict, observe and explain (POE) to support the concept and properties of physical and chemical change. The teacher provides a list of items that shows the chemical changes and physical changes on Google Classroom. The teacher also provides the worksheets to note down their predictions and findings on Google Classroom.
 - ✓ The learner explores information on the properties of chemical and physical changes from relevant resources.
 - ✓ The learner predicts whether the changes are physical or chemical and writes their prediction in the worksheet provided by the teacher.
 - ✓ The learner carries out the experiment at home to sort the list of items into chemical and physical change and notes the observation in the worksheet provided by the teacher.
 - ✓ The learner compares their prediction and post experiment result and writes the explanation in the worksheet based on observations made during the experiment and uploads it on Google Classroom.
 - ✓ The learner triangulates the information obtained from the experiment and relevant sources to differentiate between physical and chemical changes.

Assessment:

- **Contact:**
 - ✓ Assess the learner's information management skill, observation skill, honesty and integrity in carrying out the experiment through the observation of the experiment being carried out. Assess the learner's scientific knowledge on physical and chemical change based on the worksheets using rubrics. Provide necessary intervention.
- **Non-contact:**
 - ✓ Assess the learner's information management skill, observation skill, honesty and integrity in carrying out the experiment and scientific knowledge on physical and chemical change based on the worksheets using rubrics. Provide necessary intervention.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

3. Separating Mixtures

Competency:

- Determine and explain the factors affecting the solubility to relate it to everyday life.
- Classify various mixtures in daily life into homogeneous and heterogeneous mixtures.

3.1 Solutions and Solubility

(scope: concept [dilute, concentrated, aqueous, solubility], activity [making saturated solution, investigating the effect of temperature, stirring and particle size on solubility]).

Objective(s):

- i. Investigate the solubility of substances using the concept of saturated, dilute, concentrated and aqueous solutions.
- ii. Explore how temperature, stirring and particle size affect the solubility of a substance.

Learning Experiences:

- **Contact:** The teacher may deliver the lesson in following order of activity:
 - ✓ The learner explores information on the concept of saturated, dilute, concentrated and aqueous solutions through relevant resources.
 - ✓ The learner plans and carries out an experiment to investigate the solubility of substances and to explore how temperature, stirring and particle size affects the solubility of a substance.
 - ✓ The learner investigates, observes, and explains the effect of various factors on the solubility of a substance and records the findings in their notebook.

- **Non-contact:** The teacher may provide a video link on the factors affecting solubility (<https://www.youtube.com/watch?v=Zu8gzqxoZBc>)
 - ✓ The learner explores information on the concept of saturated, dilute, concentrated and aqueous solutions through relevant resources.
 - ✓ The learner observes and explains the effect of various factors on the solubility of a substance through the video link provided and records the findings in their notebook and uploads it on Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the learner's observation skill, analyzing skill, honesty and integrity in carrying out the experiment through observation. Assess the learner's conceptual understanding of saturated, dilute, concentrated and aqueous solutions and the factors affecting solubility through their notebook. The teacher may use rubrics to assess the task. Provide necessary intervention.
- **Non-contact:**
 - ✓ Assess the learner's information gathering skill, analyzing skill, and the conceptual understanding of saturated, dilute, concentrated and aqueous solutions and the factors affecting solubility through their task submitted on Google Classroom. The teacher may use rubrics to assess the task. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=Zu8gzqxoZBc>

3.2 Mixtures

(Scope: concepts and examples, activity [investigating the characteristics of homogeneous and heterogeneous mixtures]).

Objective(s):

- i. Classify various mixtures found in the physical world into the homogeneous and heterogeneous mixture.

Learning Experiences:

- **Contact:** The teacher may use evidence based arguments to deliver this lesson.
 - ✓ The learner gathers information on homogeneous and heterogeneous mixture from relevant sources.
 - ✓ The learner constructs an argument with scientific evidence to determine the mixture found around them into heterogeneous or homogeneous mixture.
 - ✓ The learner shares the argument in social media within the class and provides feedback and comments to the argument shared by other classmates.
 - ✓ The learner incorporates the feedback received from classmates and consolidates the concept of homogeneous and heterogeneous mixture and submits the written work on Google Classroom.
- **Non-contact:** The teacher may use evidence based argument to deliver this lesson
 - ✓ The learner gathers information on homogeneous and heterogeneous mixture from relevant sources.
 - ✓ The learner constructs an argument with scientific evidence to determine the mixture found around them into heterogeneous or homogeneous mixture.
 - ✓ The learner shares the argument in social media within the class and provides feedback and comments to the argument shared by other classmates.

- ✓ The learner incorporates the feedback received from classmates and consolidates the concept of homogeneous and heterogeneous mixture and submits the written work on Google Classroom.

Assessment:

- **Contact:**

- ✓ Assess the learner's information management skills, critical thinking skill and debating skill through the arguments made in any social media. Assess the conceptual understanding of homogeneous and heterogeneous from the task submitted on Google Classroom. Provide necessary intervention.

- **Non-contact:**

- ✓ Assess the learner's information management skills, critical thinking skill and debating skill through the arguments made in any social media. Assess the conceptual understanding of homogeneous and heterogeneous from the task submitted on Google Classroom. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

4. Patterns in Chemistry

Competency:

Explore the patterns of periodic table and properties of acids and bases to relate it to the composition of everyday materials and use them accordingly.

4.1 Patterns in the Periodic Table

(Scope: early attempt in classification, features of the modern periodic table).

Objective(s):

- i. Explore the early attempts in the classification of elements.
- ii. Explain the features of a modern periodic table to learn the properties of elements.

Learning Experiences:

- **Contact:** The teacher may use guided inquiry to deliver this lesson. The teacher asks ‘What were the early attempts in the classification of elements and explain the features of a modern periodic table.
 - ✓ The learner explores the information on early attempts in the classification of elements and modern features of periodic tables to show the properties of elements through relevant sources.
 - ✓ The learner uses any multimedia to prepare animated or interactive audio recorded presentations based on information gathered on early attempts in classification of elements and features of the modern periodic table.
 - ✓ The learner shares the work on Google Classroom to be critiqued by their peers and teachers.

- **Non-contact:** The teacher may use guided inquiry to deliver this lesson. The teacher post the question ‘What were the early attempts in the classification of elements and explain the features of a modern periodic table on the Google Classroom

- ✓ The learner explores the information on early attempts in the classification of elements and modern features of periodic tables to show the properties of elements through relevant sources.
- ✓ The learner uses any multimedia to prepare animated or interactive audio recorded presentations based on information gathered on early attempts in classification of elements and features of the modern periodic table.
- ✓ The learner shares the work on Google Classroom to be critiqued by their peers and teachers.

Assessment:

• **Contact:**

- ✓ Assess the learner's information assimilation skill, analytical skill, creativity skill, significance of periodic table and the scientific knowledge on historical narration of the early periodic table and features of the modern periodic table through their presentation submitted on Google Classroom using rubrics. Provide necessary intervention.

• **Non-contact:**

- ✓ Assess the learner's information assimilation skill, analytical skill, creativity skill, significance of periodic table and the scientific knowledge on historical narration of the early periodic table and features of the modern periodic table through their presentation submitted on Google Classroom using rubrics. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

4.2 Acids and Bases

(Scope: concepts, classification of acids (organic and inorganic acid); physical properties (based on colour change of indicators); Indicator; strength of acid and base; application of pH; uses of acid and base]).

Objective(s):

- i. Investigate the properties of acids and bases through observation, testing and experimentation
- ii. Explore the application of reactions between acids and bases in daily life.

Learning Experiences:

- **Contact:** The teacher may use the following order of scientific inquiry to deliver this lesson:
 - ✓ The learner explores information on classification of acids (organic and inorganic), physical properties of acid and base, indicators of acid and base and applications of acids and bases in daily life through relevant sources.
 - ✓ The learner plans and carries out an experiment to investigate the properties and strength of acid and base using indicators.
 - ✓ The learner also uses PhET to explore and determine the acidity and alkalinity of a solution. (https://phet.colorado.edu/sims/html/ph-scale-basics/latest/ph-scale-basics_en.html)
 - ✓ The learner interprets the information from the experimental investigation and the information gathered to develop conceptual understanding of the properties and strength of acid and base.
 - ✓ The learner applies the knowledge of the reactions between acids and bases in daily life.

- **Non-contact:** The teacher provides a PhET simulation link https://phet.colorado.edu/sims/html/ph-scale-basics/latest/ph-scale-basics_en.html to explore and determine the acidity and alkalinity of a solution
 - ✓ The learner explores information on classification of acids (organic and inorganic), physical properties of acid and base, indicators of acid and base and applications of acids and bases in daily life through relevant sources.
 - ✓ The learner uses PhET to explore and determine the acidity and alkalinity of a solution.
(https://phet.colorado.edu/sims/html/ph-scale-basics/latest/ph-scale-basics_en.html)
 - ✓ The learner interprets the information from the experimental investigation and the information gathered to develop conceptual understanding of the properties and strength of acid and base.
 - ✓ The learner applies the knowledge of the reactions between acids and bases in daily life.

Assessment:

- **Contact:**
 - ✓ Assess the learner's information management skill, analyzing skill, significance of the reactions between acids and base and the scientific knowledge through question answer technique using rubrics. Provide necessary intervention.
- **Non-contact:**
 - ✓ The teacher may use a quiz to assess the conceptual understanding of classification of acids, physical properties of acid and base, indicators of acid and base and applications of acids and bases in daily life on Google Classroom. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021).

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- https://phet.colorado.edu/sims/html/ph-scale-basics/latest/ph-scale-basics_en.html

STRAND: PHYSICAL PROCESS

1. Forces and Motion

Competencies:

Investigate the concept of force, simple machine and density and their effect in daily activities to do work efficiently.

1.1 Force and Linear Motion

(Scope: concept, speed and average speed calculation related to speed, balanced and unbalanced force, linear and non-linear motion, rotational motion, and conduct activity on speed).

Objective(s):

- i. Calculate the average speed of an object to compare with the total distance travelled to the total time elapsed.
- ii. Investigate the variation of speed of an object along the path travelled through an activity.

Learning Experiences:

- **Contact:** The teacher may deliver the lesson on calculation of the average speed and the variation of speed of an object. The teacher provides a worksheet containing (Distance covered, time taken and position) to the learners.
 - ✓ The learner carries out the activity to demonstrate the speed by making the friends to run and record the data in the worksheet provided by the teacher.
 - ✓ The learner explores the concepts of speed from relevant sources and uses the data to calculate the speed.
 - ✓ The learner inputs the data from the worksheet into a MS Excel sheet and generates a curve to calculate the slope which represents the speed of an object.
 - ✓ The learner explains and calculates the speed based on the information gathered.

- ✓ The learner explains the average speed of an object as variation of speed along the path travelled by an object
- **Non-contact:** The teacher may record the conceptual knowledge of speed and the method to calculate speed using any video recording software and post the video in Google Classroom.
 - ✓ The learner watches the video and explains the concepts of speed, balanced and unbalanced force and calculates the questions based on average speed.

Assessment:

- **Contact:**
 - ✓ Assess learner's ability to explain the concept of average speed and the ability to calculate the average speed using questioning and score. The teacher may also assess the learner on data analysis and interpretation skill, ability to infer and communicate the result. Provide necessary intervention.
- **Non-contact:**
 - ✓ The teacher may design questions on Google Forms to assess the concept of average and the ability to calculate the average speed using the score. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

Objective (s):

- iii. Conduct an investigation to provide evidence of the effects of balanced and unbalanced forces with relevant examples.
- iv. Identify the instances of motion observed that can be classified as a rotational motion.

Learning Experiences:

- **Contact:** The teacher may use Predict, Reason, Observe and Explain (**PROE**) to deliver this lesson. The teacher provides the worksheet that contains the information for the learner to predict, give reason for their prediction, observe and explain the effect of balanced and unbalanced forces.
 - ✓ The learner writes the prediction of effects of balanced and unbalanced forces with reasons in the worksheet provided.
 - ✓ The learner opens the link https://phet.colorado.edu/sims/html/forces-and-motion-basics/latest/forces-and-motion-basics_en.html to demonstrate the effect of balanced and unbalanced forces by setting the body into motion and rest and write their observations in the worksheet.
 - ✓ The learner explains the effects of balanced and unbalanced force on the state (rest or motion) of an object based on the observations from the given link and states a few examples based on this effect.
 - ✓ The learner relates the effects of balanced and unbalanced forces to the rotational motion through a few examples.
- **Non-contact:** The teacher may use Predict, Reason, Observe and Explain (**PROE**) to deliver this lesson. The teacher provides the worksheet that contains the information for the learner to predict, give reason for their prediction, observe and explain the effect of balanced and unbalanced forces.
 - ✓ The learner writes the prediction of effects of balanced and unbalanced forces with reasons in the worksheet provided.
 - ✓ The learner opens the link https://phet.colorado.edu/sims/html/forces-and-motion-basics/latest/forces-and-motion-basics_en.html

[basics/latest/forces-and-motion-basics_en.html](https://phet.colorado.edu/sims/html/forces-and-motion-basics-en.html) to demonstrate the effect of balanced and unbalanced forces by setting the body into motion and rest and write their observations in the worksheet.

- ✓ The learner explains the effects of balanced and unbalanced force on the state (rest or motion) of an object based on the observations from the given link and states a few examples based on this effect
- ✓ The learner relates the effects of balanced and unbalanced forces to the rotational motion through a few examples.
- ✓ The learner shares the conceptual understanding of the effect of balanced and unbalanced force on Google Classroom.

Assessment:

- **Contact:**

- ✓ Assess the learner's understanding of effects of balanced and unbalanced force while the learner demonstrates and explains the effects. Teacher may design their own rubrics to assess learners and accordingly provide necessary intervention based on the rating the learners receive.

- **Non-contact:**

- ✓ Assess the learner's understanding of effects of balanced and unbalanced force through the completed DARTs submitted by learners in the Google Classroom and provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- https://phet.colorado.edu/sims/html/forces-and-motion-basics/latest/forces-and-motion-basics_en.html

1.2 Simple Machine

(Scope: concept, mechanical advantage, velocity ratio, efficiency, examples, lever, pulley [single and fixed], gears, calculations, activity on efficiency of simple machine).

Objective(s):

- i. Investigate the mechanical advantage, velocity ratio and efficiency of simple machines to assess their application in daily life.

Learning Experiences:

- **Contact:** The teacher may carry out the instructional practices on concept, mechanical advantage, velocity ratio, efficiency and examples of classes of lever. Teacher provides a list of simple machines to classify them into different classes of lever based on the concept constructed.
 - ✓ The learners explore the information on mechanical advantage, velocity ratio, efficiency and examples of classes of lever from any relevant sources.
 - ✓ The learner classifies the levers into first, second and third class from the list of pictures of different types of lever provided by the teacher with the help of information gathered.
 - ✓ The learner completes the worksheet by filling up the mechanical advantage, velocity ratio and efficiency of a different class of lever.
 - ✓ Based on the data and information collected, the learner explains the concept of mechanical advantage, velocity ratio, efficiency and classes of lever.
- **Non-contact:** The teacher may deliver this lesson through Google Classroom as:
 - ✓ The learner opens the link <https://www.youtube.com/watch?v=RC-aHwnq90w> and <https://www.youtube.com/watch?v=Ab9CexEFwSY> which explains the mechanical advantages, velocity ratio and efficiency.

- ✓ Based on information gathered from the video, the learner designs a computer model to demonstrate mechanical advantages, velocity ratio and efficiency and classify them into different classes of lever.

Assessment:

- **Contact:**

- ✓ Assess the learner's conceptual understanding of mechanical advantages, velocity ratio and efficiency and ability to classify the simple level into first, second and third class levers, and ability to gather and interpret information from the worksheet using rubrics. The teacher may provide necessary intervention based on the learner's need.

- **Non-contact:**

- ✓ Assess the learner's conceptual understanding of mechanical advantages, velocity ratio and efficiency and ability to classify the simple level into first, second and third class levers, and ability to gather and interpret information from the computer model using rubrics. The teacher may provide necessary intervention based on the learner's need.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=RC-aHwnq90w>
- <https://www.youtube.com/watch?v=Ab9CexEFwSY>

Objective(s):

- ii. Explore how pulleys and gears multiply force, change speed and increase the efficiency through an activity.

Learning Experiences:

- **Contact:** The teacher may use scientific inquiry to deliver this lesson as:
 - ✓ The learner explores the information on pulleys and gears from the relevant sources.
 - ✓ The learner opens the link <https://www.biologycorner.com/physics/mechanics/elab-pulley.html> and carries out the activity to investigate how pulleys multiply the force, change the speed and increase the efficiency and fill the data in the worksheet given in the link.
 - ✓ The learner explores the link <https://www.youtube.com/watch?v=uz436lxb1-l> to comprehend how gears multiply the force, change the speed and increase the efficiency.
 - ✓ The explains how pulleys and gears multiply forces and are used for differences through the presentation prepared in any presentation software.

- **Non-contact:** The teacher may use scientific inquiry to deliver this lesson as:
 - ✓ The learner explores the information on pulleys and gears from the relevant sources.
 - ✓ The learner opens the link <https://www.biologycorner.com/physics/mechanics/elab-pulley.html> and carries out the activity to investigate how pulleys multiply the force, change the speed and increase the efficiency and fill the data in the worksheet given in the link.
 - ✓ The learner opens the link <https://www.youtube.com/watch?v=uz436lxb1-l> to comprehend how

gears multiply the force, change the speed and increase the efficiency.

- ✓ The learner explains how pulleys and gears multiply forces and are used for differences through the presentation prepared in any presentation software and submitted on Google Classroom.

Assessment:

- **Contact:**

- ✓ Assess the learner's conceptual understanding how pulleys and gears multiply force, change speed and increase the efficiency, ability to carry out the investigation, analyse the data by observing the learner and through the presentation while carrying out the task using a rubrics or rating scale. Provide necessary intervention.

- **Non-contact:**

- ✓ The teacher may use a quiz to assess the learner through google classroom and provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.biologycorner.com/physics/mechanics/elab-pulley.html>
- <https://www.youtube.com/watch?v=uz436lxb-l>

1.3 Density

(Scope: concept [density and relative density], activity [investigating density and relative density]).

Objective(s):

- i. Compare density with relative density through experiments and calculations.

Learning Experiences:

- **Contact:** The teacher may use scientific inquiry to deliver this lesson.
 - ✓ The learner explores the information on the concept of density with assistance from the teacher.
 - ✓ The learner calculates the mass and volume of the objects (glass block, wooden blocks, stone, etc) provided by the teacher and records the reading in tabular form.
 - ✓ The learner calculates the density of the objects from the data tabulated to compare its density with pure water.
 - ✓ The learner calculates the density of pure water by employing appropriate methods.
 - ✓ The learner compares the density of objects and pure water to construct the meaning of relative density.
 - ✓ The learner designs and explains a model of boats that floats on a surface of water based on the concept of density which is determined by the volume and mass.

- **Non-contact:** The teacher may deliver this lesson through google classroom. The teacher provides the information on density and relative density using any audio recorded presentation posts in Google Classroom.
 - ✓ The learners watches the recorded presentation and designs a model (conceptual or computer 3D) of boat that floats on a surface of water based on the concept of density which is determined by the volume and mass

Assessment:

- **Contact:**
 - ✓ Assess the learner's conceptual understanding of density and relative density, the observation skills, data collection and interpretation skill, communication skills, collaboration and scientific curiosity and honesty by using viable techniques and tools. Provide necessary intervention.

- **Non-contact:**
 - ✓ Assess the learner's conceptual understanding of density and relative density from the model through Google Classroom using any relevant tools. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

2. Energy

Competency:

Explore various forms of energy and categorise them into renewable and non-renewable energy sources to understand energy transformation and make sustainable use of energy.

2.1 Sources of Energy

(Scope: concept and activity on sources of energy, and classifying sources of energy).

Objective (s):

- i. explore various sources of energy and classify them through activities.

Learning Experiences:

- **Contact:** The teacher may carry out the instructional practices on various sources of energy and classification based on sources of energy as:
 - ✓ The learner explores the sources of energy from any relevant source (book, internet, presentation) and lists them in the notebook.
 - ✓ The learner lists the various sources of energy found in the locality.
 - ✓ The learners classify the list of sources of energy into renewable and non-renewable sources.
 - ✓ The learner debates on impacts of renewable and non renewable sources of energy.
 - ✓ The learner creates a presentation to advocate the advantages of renewable and energy sources as a sustainable source of energy based on the information gathered.

- **Non-contact:** The teacher may carry out the instructional practices on various sources of energy and classification based on sources of energy using a google form as:
 - ✓ The learner explores the sources of energy and lists them in the questionnaire provided by the teacher.

- ✓ The learner classifies them into renewable and non renewable sources of energy from the list and supports their claim with evidence.
- ✓ The learner explains the reasons for classifying the sources of energy under different groups and shares the impacts of both renewable and non renewable sources of energy with the class through google classroom.
- ✓ The learner explains the significance of renewable energy based on the information gathered.

Assessment:

- **Contact:**

- ✓ Assess the learner's understanding on sources and classification of energy sources, the impact of renewable and non renewable energy, and the communication skills with reasoning skill while debating using rubrics. The teacher provides necessary feedback based on the need.

- **Non-contact:**

- ✓ Assess the learner's understanding on sources and classification of energy sources, and the impact of renewable and non renewable energy from information shared in the Google Classroom using rubrics. The teacher provides necessary feedback based on the need.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

3. Work, Power and Energy

Competency:

Explore the concept of work and its application in daily activities by drawing the relationship between work, force and displacement through calculation.

3.1 Work, Power and Energy:

(Scope: distance and displacement, concept on work done, calculation, activity [investigating work done])

Objective(s):

- i. Differentiate between distance and displacement citing an example with pertinent calculations.
- ii. Calculate the work done with respect to force and displacement in different situations.

Learning Experiences:

- **Contact:** The teacher may carry out the instructional practices on the difference between distance and displacement based on the following order of scientific inquiry:
 - ✓ The learner explores the information about distance and displacement and work done from the relevant sources (books, internets, handouts, etc.)
 - ✓ The learner develops a model (illustration/physical) that explains differences between distance and displacement and work done.
 - ✓ Based on the concept of displacement and information gathered, the learner explains the mathematical formula of work and calculates the work from the displacement and force.
 - ✓ Based on information gathered and illustrated, the teacher may ask the learner to cite real life examples of distance, displacement and work done.

- **Non-contact:** The teacher provides the video links https://www.youtube.com/watch?v=k1t_TwApE8w and <https://www.youtube.com/watch?v=zaceSCDATjg> on Google Classroom.
 - ✓ The learner explores the video on the concept of work from the link.
 - ✓ The learner answers the questions on distance, displacement and upload on Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the learner's information management skill, ability to differentiate between distance and displacement with examples, and ability to explain the concept of work with example, ability to deduce the mathematical representation (Formula) of work, apply the formula to compute work from the given data and relate the concept of work to everyday activities. The teacher may design their own rubrics for recording to provide necessary intervention.
- **Non-contact:**
 - ✓ Assess the learner's conceptual understanding of distance, displacement and work from the questions uploaded in the Google Classroom by using scorings. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- https://www.youtube.com/watch?v=k1t_TwApE8w
- <https://www.youtube.com/watch?v=zaceSCDATjg>

4. Electricity and Magnetism

4.1 Electric Circuits

(Scope: concept [electric current and voltage, roles of resistance, transformation of electrical energy], static electricity, its effect and application in natural phenomena, activity [measuring current and voltage in series and parallel circuit, investigating the resistance of different materials, role of resistance, making your own electrostatic precipitator]).

Objective(s):

- i. Investigate the concept of electric current, voltage and the role of resistance by constructing a series and parallel circuits.

Learning Experiences:

- **Contact:** The teacher may deliver this lesson through the following order of scientific inquiry:
 - ✓ The learner explores the concept of electric current, voltage and the role of resistance in a series and parallel circuits from any relevant sources.
 - ✓ The learner uses the PhET simulation from the link https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html to measure the current and voltage and record them with different values of dc source in the worksheet provided by the teacher.
 - ✓ The learner constructs the series and parallel circuits using the same link to investigate the effect on current and voltage in series and parallel circuit. The records the values of current and voltage in a worksheet provided by the teacher.
 - ✓ The learner explains the concepts of current, charge and resistance and consequences of parallel series circuits based on the information and data gathered from relevant sources and a PhET simulation.
 - ✓ The learner applies and relates the effect of parallel and series circuits to household circuits.

- **Non-contact:** The teacher provides the following video links on Google Classroom.
 - ✓ The learner explores the link <https://www.youtube.com/watch?v=J4Vq-xHqUo8> to construct the concept of current, voltage and resistance.
 - ✓ The learner explores the link https://www.youtube.com/watch?v=x2EuYqj_0Uk to construct the parallel and series circuit and to see their effects on voltage and current.
 - ✓ The learner presents their conceptual understanding on current, voltage and resistance through powerpoint presentation and upload on Google Classroom.

Assessment:

- **Contact:**
 - ✓ Assess the learner's conceptual understanding of current, voltage, resistance and the effect of parallel and series circuits through question answer technique by using appropriate marking scheme. The teacher may assess the learner on scientific skills (Data tabulation, data analysis and interpretation) and scientific attitudes and values (Curiosity, honesty etc) by observing the learner while carrying out the task. Provide necessary intervention.
- **Non-contact:**
 - ✓ Assess the learner's conceptual understanding of current, voltage, resistance and effect of parallel and series circuit using any relevant technique through the google classroom. Provide necessary intervention
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=J4Vq-xHqUo8>
- https://www.youtube.com/watch?v=x2EuYqj_0Uk
- https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html

Objective (s):

- ii. Design an experiment to test electrical energy transformation with relevance to practical applications.

Learning Experiences:

- **Contact:** The teacher may use Predict, Observe, and Explain (POE) to deliver this lesson as The provides the worksheet that contains the list of activities related to electricity.
 - ✓ The learner predicts the transformation of energy happening in the activity provided by the teacher.
 - ✓ The learner carries out the activities practically for doable activities and explores the information from relevant sources for unavailable and undobale activities
 - ✓ The learner records the observations in the worksheet in terms of transformation of energy.
 - ✓ The learner explains the transformation of electrical energy to other forms of energy based on the observation and information.
 - ✓ The learner explains the importance of electrical energy based on evidence of many forms of energy being converted from electrical energy.
- **Non-contact:** The teacher may use Predict, Observe, and Explain (POE) to deliver this lesson through Google Classroom. The teacher provides the worksheet that contains the list of activities related to electricity.

- ✓ The learner predicts the transformation of energy happening in the activity provided by the teacher.
- ✓ The learner carries out the activities practically for doable activities and explores the information from relevant sources for unavailable and un-doable activities
- ✓ The learner records the observations in the worksheet in terms of transformation of energy.
- ✓ The learner explains the transformation of electrical energy to other forms of energy based on the observation and information.
- ✓ The learner explains the importance of electrical energy based on evidence of many forms of energy being converted from electrical energy.

Assessment:

- **Contact:**

- ✓ Assess the learner's conceptual understanding of conversion of electrical energy into different forms of energy by observing and recording in observation form. The teacher may also assess the analysing skill, observation and interpretation skill using observation technique and rubrics. Provide necessary intervention.

- **Non-contact:**

- ✓ Assess the learner's conceptual understanding of conversion of electrical energy into different forms of energy by observing and recording in observation form. The teacher may also assess the analysing skill, observation and interpretation skill using observation technique and rubrics. Provide necessary intervention.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

Objective(s):

- iii. Explore the effect and application of static electricity in day to day life.
- iv. Demonstrate the presence of charges in different materials by the generation of static electricity.

Learning Experiences:

- **Contact:** The teacher may use structured inquiry to deliver this lesson. The teacher asks the learner to explore information on static electricity and effects and application of static electricity from relevant sources. The teacher provides the link https://phet.colorado.edu/sims/html/balloons-and-static-electricity/latest/balloons-and-static-electricity_en.html to demonstrate the static charge.
 - ✓ Based on the information gathered from relevant sources and concepts built from simulation, the learners explain the concept of generation of static electricity and effects and application of static electricity.
 - ✓ Based on the concept of static electricity, the learner demonstrates the understanding of natural phenomena of static electricity and safety measures from static electricity through presentation.
- **Non-contact:** The teacher provides the list of activities that are doable at home to show the development of static electricity and asks them to explore the effect and application of static electricity from relevant sources. The teacher may ask the learner to present the conceptual understanding in the form of animated presentation.

Assessment:

- **Contact:**
 - ✓ Assess the learner's concept of development of static electricity and application and effects of static electricity, information management, and ability to apply the concept of static electricity in natural phenomena, through presentation using rubrics. Provide necessary intervention.

- **Non- contact:**
 - ✓ Assess the learner’s conceptual understanding of static electricity through the presentation using rubrics. Provide necessary intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- https://phet.colorado.edu/sims/html/balloons-and-static-electricity/latest/balloons-and-static-electricity_en.html

4.2 Magnetism

(Scope: concept on magnetisation, activity to investigate particle arrangement in a magnet).

Objective(s):

- Investigate the particle arrangement in a magnet to explain the concept of magnetisation.

Learning Experiences:

- **Contact:** The teacher may use structured inquiry to deliver this lesson as:
 - ✓ The learner predicts particle arrangement of magnets to explain the concept of electromagnetism.
 - ✓ The learner carries out an experiment following the procedure provided by the teacher to investigate the particle arrangement of magnets.
 - ✓ The learner explains the particle arrangement of magnets to explain the electromagnetism based on finding from the experiment.

- ✓ The learner explains the concept of electromagnetism based on the concept of arrangement of particles in magnets.
- **Non-contact:** The teacher may deliver this lesson through Google Classroom as:
 - ✓ The learner may explore from any other relevant materials (books, online pieces, articles, etc.) that explains electromagnetism
 - ✓ Based on the information gathered from relevant materials, the learner prepares notes on arrangement of particles in magnetism.
 - ✓ The learner explains the concept of electromagnetism based on the concept of arrangement of particles in magnets.

Assessment:

- **Contact:**
 - ✓ Assess the learner's conceptual understanding of arrangement of particles in magnets, the ability to carry out the experiment based on the procedure provided and infer the result with scientific honesty. Teacher may design their own rubrics to assess learners and accordingly provide necessary intervention based on the rating the learners receive.
- **Non-contact:**
 - ✓ Assess the learner's conceptual understanding of arrangement of particles in magnets and the ability to manage the information provided through Google Classroom. Teacher may design their own rubrics to assess learners and accordingly provide necessary intervention based on the rating the learners receive.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)

5. Light and Sound

5.1 Light and its Properties

(Scope: concept [propagation, reflection and its types, terms used in reflection, laws of reflection, reflection through plane mirror, spherical mirrors, terms used in spherical mirrors, types of spherical mirror, formation of image by spherical mirrors -concave and convex, formation of image by concave and convex, uses of concave and convex mirrors], activity [investigating speed of light, investigate laws of reflection, identifying types of spherical mirror]).

Objective (s):

- i. Investigate the speed of light in different media and numerate the laws of reflection of light.

Learning Experiences:

- **Contact:** The teacher may use blended learning method by using scientific inquiry to deliver the lesson as:
 - ✓ The learner explores the properties of light and laws of reflection from any relevant sources.
 - ✓ The learner opens the link https://phet.colorado.edu/sims/html/bending-light/latest/bending-light_en.html to investigate the speed of light (properties) in different media (water, glass, air etc)
 - ✓ The learner carries out an investigation to verify the laws of reflection of light with the procedure and material provided by the teacher.
 - ✓ The learner explains the speed of light and laws of reflection based on the information gathered and finding from the experiments.
 - ✓ The learner relates the angle of incidence and refraction to deduce the refractive index which determines the speed of light in different media.

- **Non-contact:** The teacher may use Google Classroom to deliver this lesson as:
 - ✓ The learner explores the properties of light and laws of reflection from any relevant sources.
 - ✓ The learner opens the link https://phet.colorado.edu/sims/html/bending-light/latest/bending-light_en.html to investigate the speed of light (properties) in different media (water, glass, air etc)
 - ✓ The learner carries out an investigation to verify the laws of reflection of light from the link <http://www.ophysics.com/l7.html> by changing the angle of incidence and angle of reflection.
 - ✓ The learner explains the speed of light and laws of reflection based on the information gathered and findings from the experiments.
 - ✓ The learner relates the angle of incidence and refraction to deduce the refractive index which determines the speed of light in different media.

Assessment:

- **Contact:**
 - ✓ Assess the learner's understanding on properties of light, speed of light in different media and the laws of reflection of light from the report using appropriate rubrics. Assess the observation skill, data recording and analysing skill, and ability to apply the concept to relate refractive index to speed of light. The teacher may provide necessary intervention based on need.
- **Non-contact:**
 - ✓ Assess the learner's understanding on properties of light, speed of light in different media and the laws of reflection of light from the report using appropriate rubrics. The teacher may also assess data recording and analysing skill and ability to apply the concept to relate refractive index to speed of light. The teacher may provide necessary intervention based on need.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- https://phet.colorado.edu/sims/html/bending-light/latest/bending-light_en.html
- <http://www.ophysics.com/l7.html>

Objective(s):

- ii. Construct a ray diagram to illustrate the formation of an image by a spherical mirror.
- iii. Explore the uses of concave and convex mirrors in a variety of situations to relate the concept to real life situations

Learning Experiences:

- **Contact:** The teacher may carry out the instructional practice on formation of an image by a spherical mirror as:
 - ✓ The learner explores the technical terms related to mirrors and images formed by spherical mirrors.
 - ✓ The learner opens the link <http://www.ophysics.com/l9.html> to investigate the formation of images by plane mirror by varying the position of the object.
 - ✓ The learner draws a diagram to show the formation of an image and writes down the nature of images formed by the mirror based on the position of the objects in the tabular form.
 - ✓ The learner explores the application of spherical mirrors based on the nature of image formed.
- **Non-contact:** The teacher may deliver this lesson through Google Classroom as:
 - ✓ The learner explores the technical terms related to mirrors and images formed by spherical mirrors.

- ✓ The learner opens the link <http://www.ophysics.com/l9.html> to investigate the formation of images by plane mirror by varying the position of the object.
- ✓ The learner draws a diagram to show the formation of an image and writes down the nature of images formed by the mirror based on the position of the objects in the tabular form.
- ✓ The learner explores the application of spherical mirrors based on the nature of image formed.
- ✓ The learner uploads their work through Google Classroom.

Assessment:

- **Contact:**

- ✓ The teacher may assess the learner's understanding of nature and formation of images by plane and spherical mirror from the illustration using the appropriate tools. The teacher may provide necessary intervention based on the need.

- **Non-contact:**

- ✓ The teacher may assess the learner's understanding of nature and formation of images by plane and spherical mirror from the illustration using the appropriate tools. The teacher may provide necessary intervention based on the need.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <http://www.ophysics.com/l9.html> .

5.2 Sound and Hearing

(Scope: concept [production and propagation, wave patterns of different sound, range of audibility, uses of ultrasonic and infrasonic sound, effect of loud sound], activity [investigate sound wave, identifying sound in the surrounding]).

Objective(s):

- i. Investigate the properties of sound in terms of its production and propagation.
- ii. Explore different mediums through which sound travels through an activity.
- iii. Investigate how loud sounds and noise pollution cause damages to the ear to propose ways to reduce sound pollution in the locality.

Learning Experiences:

- **Contact:** The teacher may deliver the lesson as:
 - ✓ The learner explores information on production and propagation, wave patterns of different sounds, range of audibility, uses of ultrasonic and infrasonic sound, effect of loud sound from any relevant sources.
 - ✓ The learner analyses and interprets the data collected on how the sound propagates through different mediums.
 - ✓ The learner plans and designs an experiment to see how sound travels through different mediums.
 - ✓ The learner uses Scratch programming to create an animation to design solutions to reduce sound pollution in the locality.

- **Non-contact:** The teacher provides a video link to see how sound travels through different medium. (<https://www.youtube.com/watch?v=AxNdr0Bcx20>) on Google Classroom.
 - ✓ The learner explores and investigates properties of sound and the propagation of sound through different mediums.

- ✓ The learner uses Scratch programming to create an animation to design solutions to reduce sound pollution in the locality.

Assessment:

- **Contact:**

- ✓ Assess the learner's analysing and interpreting skills through observation. The teacher may design their own rubrics. Provide necessary intervention.

- **Non-contact:**

- ✓ Assess the learner's analysing and interpreting skills through observation. The teacher may design their own rubrics. Use Q/A technique to check the conceptual understanding. Provide necessary intervention.

- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=AxNdr0Bcx20>

6.The Earth and Beyond

Competency:

Describe the formation of solar systems with the features and distance of planets from the sun to identify features of each planet.

(Scope: formation of the solar system, concept on sun, satellites, asteroids, meteoroids, and planets)

Objective(s):

- i. Describe the formation of solar system using information from the internet
- ii. Investigate features of planets in the solar system through activity and information from the internet.

Learning Experiences:

- **Contact:** The teacher may deliver this lesson through the following order of scientific inquiry:
 - ✓ The learner searches the information on formation of the solar system from the link <https://www.youtube.com/watch?v=x1QTc5YeO6w> or <https://www.youtube.com/watch?v=IRZYMimUET8>.
 - ✓ The learner may be asked to decode the information on the solar system, comets and meteoroids from the link <https://www.youtube.com/watch?v=eCUng5Vl4P4> and designs activity to show planets in the solar system.
 - ✓ Based on the gathered information, the learner prepares a presentation using PowerPoint, smart draw, scratch programming etc. that explains the formation of the solar system and features of planets and presents their work to the class.
- **Non-contact:** The teacher may use Google Classroom to deliver this lesson.
 - ✓ The learner may be asked to search information on formation of the solar system from the link <https://www.youtube.com/watch?v=x1QTc5YeO6w> or

<https://www.youtube.com/watch?v=IRZYMimUET8> and prepare note on the same.

- ✓ The learner may be asked to decode the information on the solar system, comets and meteoroids from the link <https://www.youtube.com/watch?v=eCUnq5Vl4P4> and sketch the diagram of the solar system.
- ✓ Based on the gathered information, ask the learners to prepare a presentation using PowerPoint, smart draw, scratch programming etc. that explains the formation of the solar system and features of planets and submit their work through Google Classroom.

Assessment:

- **Contact:**

- ✓ Assess the learner's conceptual understanding of formation of the solar system, the concept of sun, comets and meteoroids, information management and analysing skills, and creativity from a presentation based on the rubrics and checklist and provide necessary feedback and intervention.

- **Non-contact:**

- ✓ Assess the learner's conceptual understanding of formation of the solar system, the concept of sun, comets and meteoroids from a presentation based on the rubrics and checklist in the Google Classroom. Provide necessary feedback and intervention.
- For recording and reporting, refer to New Normal Curriculum Framework of Science (2021)

Resources:

- REC repository
- Science Textbook for Class VII (2020), REC
- New Normal Curriculum Framework of Science (2021)
- <https://www.youtube.com/watch?v=x1QTc5YeO6w>
- <https://www.youtube.com/watch?v=IRZYMimUET8>
- <https://www.youtube.com/watch?v=eCUnq5Vl4P4>