

# NEW NORMAL CURRICULUM

## Instructional Guide

### General Science

#### Class V



**Royal Education Council**

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### **General Science**

#### **Class V**



**Curriculum Development Centre  
Royal Education Council  
Royal Government of Bhutan**

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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 21<sup>st</sup> 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. Classification and Variation

#### Competencies:

Explore variations among organisms based on their characteristics to value diversity.

#### 1.1. Variations

*(Scope: characteristics of plants and animals, individual differences and variation among humans, plants and animals).*

#### Objective(s):

- i. Investigate variations among organisms based on their characteristics.

#### Learning Experiences:

- **Contact:** The teacher may organise a field trip for the learner to find out variation among organisms.
  - ✓ The learner explores the meaning and examples of variation from the internet link  
<https://www.bbc.co.uk/bitesize/topics/zpffr82/articles/z6s26yc>.
  - ✓ The learner plans a field trip to observe plants and animals in the surrounding based on their noticeable features.
  - ✓ The Learner collects leaves from different types of plants to compare them in terms of colour, size and shape. The similarities and differences may be recorded in a tabular form.
  - ✓ In a similar way, the learner compares animals based on their size, colour, body features and accordingly records their similarities and differences in a tabular form.
  - ✓ The learner uses the information gathered to construct an explanation on the existence of variation of organisms.
- **Non-contact :** Teacher may provide materials (such as pictures, video link, downloaded video, books) of different plants and animals on Google Classroom.

- ✓ Based on the materials received on Google Classroom the learner compares the shapes and colours of leaves of the different types of plants, and takes note of similarities and differences.
- ✓ The learner explores and records the similarities and differences in colour and body features of different animals based on the materials received on google classroom.
- ✓ The learner uses the information gathered to construct an explanation on the existence of variation of organisms.

**Assessment:**

- **Contact:**

- ✓ Assess the learner's scientific observation skills, comparing skills and comprehension of the existence of variation in plants and animals by observing the learner while performing tasks. A simple observation form may be used to record for future necessary intervention.

- **Non-contact:**

- ✓ Assess the learner's comparing skills and comprehension on the existence of variation in plants and animals by using Question & Answer and accordingly provide necessary guidance and support. The teacher may use their own rubrics to assess.

- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.bbc.co.uk/bitesize/topics/zpffr82/articles/z6s26yc>

## 2. Human and Animal

### Competencies:

Explain the mode and importance of nutrition, circulation, movement and reproduction in humans and animals to recognise the role of each phenomena.

### 2.1 Nutrition

*(Scope: category and functions of energy giving, body building and protective food, impact of junk food on our health and lifestyle).*

### Objective(s):

- i. Explore the importance of eating different food groups using the internet.
- ii. Design a poster to advocate on the harmful impacts of eating junk food.

### Learning Experiences:

- **Contact:** The teacher may use scientific inquiry to deliver the lesson on food groups and their functions, and the impacts of eating junk food.
  - ✓ The learner explores the internet link <https://www.healthline.com/health/food-nutrition/six-essential-nutrients#fats> or any other relevant sources to find about food groups and their functions, and impacts of eating junk food.
  - ✓ The learner lists down different foods and categorizes them into different food groups and explains the importance of each food group in daily diet.
  - ✓ The learner uses desktop publishing software such as MS word, MS paint, Photoshop, Smartdraw, etc. to design a poster to advocate on the impacts of eating junk food.
  
- **Non-contact:** The teacher may provide materials (such as pictures, video link, downloaded video, books) of different food groups and their function, and impact of eating junk food on Google classroom.



- ✓ The learner uses the internet link <https://www.healthline.com/health/food-nutrition/six-essential-nutrients#fats> or any relevant sources to explore food groups and their functions, and impacts of eating junk food.
- ✓ The learner categorizes food available at home into different food groups and prepares a shopping list to purchase the missing food group.
- ✓ The learner designs a poster to advocate on impacts of eating junk food using a suitable ICT tool.

### **Assessment:**

- **Contact:**

- ✓ Assess the learner's exploring skills, information gathering skills, differentiating skill and their understanding on the different food groups and their functions. Assess the poster designed to advocate on the impacts of eating junk food. Rubric or rating scale may be used to assess learners and accordingly provide necessary intervention.

- **Non-contact:**

- ✓ Assess the learner's exploring skills, information gathering skills, differentiating skill and their understanding on the different food groups and their functions. Assess the poster designed to advocate on the impacts of eating junk food. The teacher may design a rubric or rating scale to assess learners and accordingly provide necessary intervention.

- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

### **Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.healthline.com/health/food-nutrition/six-essential-nutrients#fats>

## 2.2 Circulation

*(Scope: Functions of heart, arteries and veins).*

### Objective(s):

- i. Develop a model of the human circulatory system to describe its parts and functions.

### Learning Experiences:

- **Contact:** The teacher may use scientific inquiry for instructional practices on the parts of circulatory system, and their function:
  - ✓ The learner explores information from the link <https://www.youtube.com/watch?v=W3PwEiqxl7g> on the parts of the circulatory system, and their functions.
  - ✓ The learner develops a model of the circulatory system (using available local materials like cardboards, straws, pipe, or anything available that can be used) labelled with the function of different parts in teams.
- All the teams present their model to the whole class.
  
- **Non-contact:** The teacher may share the web link <https://www.youtube.com/watch?v=W3PwEiqxl7g> that explains the parts of the circulatory system and their function on Google Classroom. The teacher designs a set of questions to check the learner's understanding on the parts of the circulatory system, and their functions.
  - ✓ The learner uses the link provided to explore on the circulatory system and answers the questions given on Google Classroom.

### Assessment:

- **Contact:**
  - ✓ Assess the appropriateness of the model developed by the learner and understanding of the learner on parts of the circulatory system and their function during the presentation. The teacher may develop rubrics to assess the model and presentation and plan appropriate intervention.

- **Non-contact:**
  - ✓ Assess the learner's answers to the questions posted on the Google Classroom. The teacher may design rubrics to assess the learner's answers and provide necessary feedback and appropriate intervention.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=W3PwEiqxl7g>

**2.3 Movement**

*(Scope: structure of biceps, triceps, functions [shape, support and movement]).*

**Objective(s):**

- Develop an arm model to explain the location, structure and function of biceps and tricep muscle.

**Learning experiences:**

- **Contact:** The teacher may use the scientific inquiry process to let learners develop an arm model to understand and explain the location, structure and function of biceps and triceps. The teacher provides the information about the location, structure and functions of bicep and tricep muscles.
  - ✓ The learner draws a rough diagram of the bicep and tricep muscle showing structure and function based on the information given by the teacher.
  - ✓ The learner develops an arm model using available materials based on the information gathered.
  - ✓ The learner then tests the function of bicep and tricep muscle using the model developed.

- ✓ The learner explains the structure, location and function of biceps and triceps based on the model developed.
- **Non-contact:** The teacher may ask learners to read and note the location, structure and function of the bicep and tricep muscles from the internet link <https://northtampachiropractor.com/2013/03/biceps-triceps-work/> to develop the model of the bicep and tricep muscle.
  - ✓ The learner develops an arm model using available materials based on the information gathered from the given link.
  - ✓ The learner tests the function of bicep and tricep muscle using the model developed.
  - ✓ The learner explains the structure, location and function of biceps and triceps based on the model developed.

#### **Assessment:**

- **Contact:**
  - ✓ Assess the learner's plan and design of the model of bicep and tricep muscle. The learner's comprehension on location, structure and function of bicep and tricep muscle may be assessed while the learner explains. The teacher may design and use rubrics to assess and plan appropriate interventions.
- **Non-contact:**
  - ✓ Assess the learner's model of bicep and tricep muscle. The teacher may design and use rubrics to assess. The teacher may post a quiz on Google Forms to check learner's comprehension on location, structure and function of bicep and tricep muscle. Provide necessary support and guidance to the learner based on responses received.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

#### **Resources:**

- REC repository
- Science Textbook for Class V(2020), REC

- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://northtampachiropractor.com/2013/03/biceps-triceps-work/>

## 2.4 Reproduction

*(Scope: stages of life cycle, e.g. life cycle of a butterfly).*

### Objective(s):

- Describe the life cycle of common animals through observation in nature.

### Learning Experiences:

- **Contact:** The teacher may use a scientific inquiry to deliver the lesson on life cycle of animals.
  - ✓ The learner makes guesses and takes down a note on what sort of stages may be involved in the life cycle of a butterfly.
  - ✓ After the prediction, the learner watches a video on the web link, <https://www.youtube.com/watch?v=O1S8WzwLPIM> and notes down the different stages in the life cycle of a butterfly.
  - ✓ The learner compares the two different notes from prediction and post video watching to see how far the prediction has been correct.
  - ✓ The learner writes a reflection on the significance of different stages in the life cycle of a butterfly.
- **Non-contact:** The teacher may provide a video web link, <https://www.youtube.com/watch?v=O1S8WzwLPIM> that explains the life cycle of a butterfly on Google Classroom.
  - ✓ The learner watches the video and takes note of different stages in the life cycle of a butterfly.
  - ✓ Based on the concept learned from the video, the learner draws and labels the different stages in the life cycle of a butterfly.
  - ✓ The learner writes down a reflection on the significance of different stages in the life cycle of animals.

**Assessment:****• Learning Experiences:**

- ✓ Assess the learner's ability to explain the different stages in the life cycle of a butterfly. Evaluate the learner's reflection written on the significance of different stages in a life cycle of an animal. The teacher may design and use their own rubrics.

**• Non-contact Learning:**

- ✓ Evaluate the work submitted by the learner on Google Classroom. Evaluate the reflection written by the learner on the significance of different stages in the life cycle of an animal. The teacher may develop and use their own rubrics.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=O1S8WzwLPIM>



### 3. Green Plants

#### Competencies:

Explore the mode and significance of nutrition and reproduction in plants to appreciate their role in survival of plants.

#### 3.1 Water and Mineral Transport

*(Scope: function of roots and stem).*

#### Objective(s):

- i. Investigate the functions of roots and stem in transporting water and minerals to the leaves.

#### Learning Experiences:

- **Contact:** The teacher may use Kolb's cycle of experiential learning to deliver the concept of transportation of water and minerals by root and stem in plants.
  - ✓ The learner gathers information on the functions of roots and stem from the internet link <http://aven.amritalearning.com/index.php?> .
  - ✓ The learner designs an experiment to investigate the transportation of water and minerals by roots and stem in the plant.
  - ✓ The learner conducts an experiment and notes down the observation.
  - ✓ The learner explains the transportation of water and minerals in plants.
- **Non-contact:** The teacher posts the following instruction to the learner to deliver the concept on transportation of water and minerals in plants.
  - ✓ The learners explore the absorption and transportation of water and minerals in plants from the internet <http://aven.amritalearning.com/index.php?> .
  - ✓ Based on the information gathered the learners create a short video explaining the transportation of water and minerals in plants with the help of a diagram.



**Assessment:****• Contact:**

- ✓ Assess the conceptual understanding of the learner on the functions of roots and stem in transporting water and minerals by asking questions. Assess the learner's experiment by designing rubrics to assess and plan intervention accordingly.

**• Non-contact:**

- ✓ Assess the learner's video that explains the transportation of water and minerals in plants. The teacher designs rubrics to assess the video of the learner and provide necessary feedback.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <http://aven.amritalearning.com/index.php?>

**3.2 Reproduction**

*(Scope: parts of a flower [pedicel, sepal, petal, carpel, and stamen] and its functions).*

**Objective(s):**

- i. Explore different parts of a flower using a flower from the locality to study the functions of different parts of the flower.

**Learning Experiences:**

- **Contact:**The teacher may use scientific inquiry to deliver the lesson on parts of a flower and their functions. The teacher provides a flower available in the locality to the learner.

- ✓ The learner observes the flower and explores the name of the parts and their functions from the web link  
<https://www.youtube.com/watch?v=5O-q3alPFOo>.
  - ✓ The learner preserves the parts of the flower to be dried and pasted in their scrapbook.
  - ✓ The learner draws a labelled diagram of a flower.
  - ✓ The learner further reflects on the importance of reproduction in plants.
- **Non-contact:** Teacher may share the link  
<https://www.youtube.com/watch?v=5O-q3alPFOo> to teach the lesson on parts of a flower and their functions on Google classroom.
    - ✓ The learner collects any flower from the surrounding and separates all the parts of the flower to study its parts.
    - ✓ The learner preserves the parts of the flower to be dried and pasted in their scrapbook.
    - ✓ The learner draws a labelled diagram of a flower.
    - ✓ The learner writes down the reflection on the significance of flowers.

#### **Assessment:**

- **Contact:**
  - ✓ Assess the learner's ability to dissect the flower and identify each part and their role in reproduction, as the learner performs the task. Assess the learner's diagram and the reflection on importance of reproduction in plants. The teacher may design rubrics or checklists to assess and plan appropriate intervention.
- **Non-contact:**
  - ✓ Assess the learner's ability to identify the parts of a flower from the diagram. Assess the learner's reflection written on the importance of reproduction in plants. The teacher may design rubrics or checklists to assess and plan appropriate intervention.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=5O-q3alPFOo>

## 4. Living Things and their Environment

### Competencies:

Investigate the impact of human activities on the habitat and the mechanism of feeding relationships in order to understand the effects and interdependence of organisms.

### 4.1 Threat to Habitat

*(Scope: saving threatened plants and animals, causes of disappearing forest, protecting habitat).*

### Objective(s):

- i. Explore how human activities alter the habitat and pose threat to plants and animals.
- ii. Promote the conservation of the habitat of plants and animals by creating a poster.

### Learning Experiences:

- **Contact:** The teacher may use design thinking to deliver the lesson on how human activities alter the habitat and pose threat to plants and animals, and understand the ways to promote the conservation of the habitat of plants and animals.
  - ✓ The learner collects information on how human activities affect the habitat and pose threat to the plants and animals, and ways to promote the conservation of the habitat of plants and animals from the internet.
  - ✓ The learner identifies human activities that pose threat to the habitat of plants and animals based on the information collected.
  - ✓ The learner identifies the ways to promote the conservation of the habitats of plants and animals.
  - ✓ The learner designs posters using suitable ICT tools to create awareness on the conservation of the habitat of plants and animals.
  - ✓ The learner creates awareness on conservation of the habitat of plants and animals using the poster developed and encourages the local people to practice.
- **Non-contact:** The teacher may post information on how human activities alter the habitat and pose threat to the plants and animals, and ways to protect habitat of plants and animals on Google Classroom.

- ✓ The learner designs a poster using suitable ICT tools to create awareness on how human activities affect the habitat. The poster must include ways to conserve the habitat of plants and animals.

**Assessment:**

- **Contact:**

- ✓ Assess the poster developed by the learner and check understanding on how human activities alter the habitat and pose threat to plants and animals. The teacher may design rubrics to assess and plan appropriate interventions.

- **Non-contact:**

- ✓ Assess the poster developed by the learner and check understanding on how human activities alter the habitat and pose threat to plants and animals. The teacher may design rubrics to assess and plan appropriate interventions.

- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC

## 4.2 Food Chains and Feeding Relationships

*(Scope: food chain [producer, primary, secondary, tertiary and quaternary consumer] food web).*

**Objective(s):**

- Construct a food chain showing producers and all types of consumers using a suitable ICT tool.
- Draw a food web based on the feeding relationship observed in the locality.

### **Learning Experiences:**

- **Contact:** The teacher may lead a brainstorming session by asking questions on how plants and animals are interdependent, what sort of foods are eaten by human beings, and what do plants need for growth and development to conceptualize the feeding relationship among the organisms in nature.
  - ✓ The learner engages in a role play based on the food chain to understand interdependence of plants and animals.
  - ✓ The learner assumes themselves to be producers and consumers (primary, secondary, tertiary and quaternary) in the role play to realize the interdependence of organisms in nature.
  - ✓ After the game, the learner illustrates a food chain showing interlink among the producers and all types of consumers with the help of a smart draw, Photoshop, MS word, etc.
  - ✓ The learner uses the link <https://www.youtube.com/watch?v=FFloV2J-eKI> to explore about food web.
  - ✓ The learner draws a food web based on the feeding relationship existing in the locality.
  
- **Non-contact:** The teacher may share the web link <https://www.youtube.com/watch?v=FFloV2J-eKI> to deliver the lesson on food chain and food web. The teacher also shares a picture of a food web.
  - ✓ The learner identifies as many food chains from the food web using the information from the link provided.
  - ✓ The learner indicates the producer and consumers (primary, secondary, tertiary and quaternary) in the food chain identified.
  - ✓ The learner writes a reflection on the consequences of removing one of the organisms from the food web, on the ecosystem.
  - ✓ For additional learning, the learner may play educational games on food chain and web which is available online.

### **Assessment:**

- **Contact:**
  - ✓ Assess the learner's ability to draw food chain and identify producers and consumers. Assess the learner's ability to draw a food web and the understanding on the significance of each organism in the food chain. The teacher may design and use the rubrics and provide intervention if necessary.

- **Non-contact:**
  - ✓ Assess the learner's ability to identify food chains from the food web and the ability to identify producers and consumers. Assess the learner's understanding on the significance of each organism in the food chain/web. The teacher may design and use the rubrics and provide necessary intervention and feedback.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=FFloV2J-eKI>

## STRAND: MATERIALS AND THEIR PROPERTIES

### 1. Grouping and Classifying Materials

#### Competencies:

Differentiate the common substances in the locality into elements and compounds.

#### 1.1 Element and compound

*(Scope: Concept of element and compound, their examples and differences).*

#### Objective(s):

- i. Classify the substances found in the locality into elements and compounds based atoms present in it.

#### Learning Experiences:

- **Contact:**Teacher may use Research, Evidence and Inference (REI) to deliver this lesson.
  - ✓ The learner searches for information on elements and compounds based on types of atoms from relevant sources (books, internets, handouts, etc.)
  - ✓ The learner collects the evidence from relevant sources to infer that element and compounds are different based on the type of atoms.
  - ✓ The learner draws the inference that the element is made of only one type of atom whereas compound is made up of two or more than two different types of atoms.
  - ✓ The learner explores common materials in the surrounding and differentiate them into elements and compounds.
- **Non-contact:** Teacher may provide the link <https://www.youtube.com/watch?v=avgFqINML5o>, explaining the difference between elements and compounds.



- ✓ The learner reads the material to differentiate the element and compound based on types of atoms.

**Assessment:**

- **Contact:**

- ✓ Assess learner's access skill, information management skill, inferences skill, and differentiating skills by observing learners as they perform the task on elements and compounds. The teacher may design and use rubrics to assess and provide necessary guidance.

- **Non-contact:**

- ✓ The teacher may design a quiz on Google Forms to assess differences between elements and compounds. Provide necessary intervention to the learner based on responses from the learners.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=avgFqINML5o>

## 2. Materials and Change

### Competencies:

Investigate various kinds of physical changes occurring in materials to appreciate the physical processes and its effect in nature.

### 2.1 Matter

*(Scope: change of state, the process of change [melting, freezing, condensation, sublimation], properties of solid, liquid and gas [shape, volume, particle arrangement]).*

### Objective(s):

- i. Investigate various kinds of processes that result in a change in the state of matter.
- ii. Investigate the properties of solid, liquid and gas based on shape, volume and particle arrangement in them through an activity.

### Learning Experiences:

- **Contact:** The teacher may use experiment and PhET simulation link <https://phet.colorado.edu/sims/html/states-of-matter/> to show learners the change in states of matter and to understand the properties of solid, liquid and gas based on shape, volume and particle arrangement in them.
  - ✓ The learner gathers information on three states of matter and their properties based on shape, volume and particle arrangement in them from the internet source <https://www.google.com/search?q=states+of+matter+and+their+properties> or from any other relevant sources.
  - ✓ The learner, in the teams, carries out experiments on melting, freezing, evaporation, condensation and sublimation and notes down the change taking place in the matter.
  - ✓ After conducting the experiment the learner uses a PhET simulation to get clear understanding of the processes of change of the matter.
  - ✓ The learner explains the change in properties of matter as the matter changes from one state to another state.

- **Non-contact:** The teacher may carry out the experiments to show the change in the states of matter during melting, freezing, evaporation, condensation and sublimation. The teacher makes videoclips of the experiments carried out and posts the video on the Google Classroom.
  - ✓ The learner watches the video posted in the Google Classroom and notes down the changes taking place in the states of matter.
  - ✓ The learner uses PhET simulation from the given link <https://phet.colorado.edu/sims/html/states-of-matter/> to understand the process of the changes taking place in the states of matter.
  - ✓ The learner explains the change in properties of matter as the matter changes from one state to another state and submit through the Google classroom.

#### **Assessment:**

- **Contacts:**
  - ✓ Assess learner's observation skill, handling skill, inference skill and understanding of change in properties of matter when a matter changes from one state to another. The teacher may design and use their own checklist and give necessary support and feedback.
- **Non-contact:**
  - ✓ Assess learner's understanding of change in properties of matter when a matter changes from one state to another. The teacher may design and use their own rubrics and provide intervention accordingly.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

#### **Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://phet.colorado.edu/sims/html/states-of-matter/>

- <https://www.google.com/search?q=states+of+matter+and+their+properties>

## 2.2 Changes

*(Scope: natural and human-made changes [differences and examples], physical changes [reversible and temporary, examples], and melting, freezing, boiling, evaporation as physical change).*

### Objectives:

- Explore examples of natural and human-made changes in the locality.
- Investigate physical changes to verify the properties and examples of a physical change.
- Verify various processes that bring about physical changes in nature.

### Learning Experiences:

- Contact:** The teacher may use structured inquiry to deliver the lesson on natural and human-made changes, and physical change.
  - ✓ The learner explores natural and human made changes from the link <https://www.youtube.com/watch?v=FKfLArLpkIs> to identify the natural and human made changes in the surrounding.
  - ✓ The learner, in the team, investigates whether melting is a physical change.
  - ✓ The learner conducts an experiment using any available materials (butter, candle, ice cubes, etc.) to investigate the properties of physical change.
  - ✓ The learner draws conclusions based on the finding.
  - ✓ The whole class discusses the significance of change and various processes that cause physical change in nature.
- Non-contact:** The teacher may share a video from the web link <https://www.youtube.com/watch?v=FKfLArLpkIs> that explains natural and human made change, on Google Classroom.
  - ✓ The learner identifies the natural and human made changes in the surrounding.

- ✓ The learner investigates whether melting is a physical change.
- ✓ The learner conducts an experiment using any available materials (butter, candle, ice cubes, etc.) to investigate the properties of physical change.
- ✓ The learner draws conclusions based on the finding.
- ✓ The learner explains the significance of change and various processes that cause physical change in nature.

### **Assessment:**

- **Contact:**

- ✓ Assess the learner's ability to identify natural and human-made changes and reflect on their significance, while performing the task. During the experiment, assess the learner's ability to identify the properties of physical change and various processes that cause change in nature. The teacher may design rubrics or checklists to assess the learner and provide necessary help and guidance.

- **Non-contact:**

- ✓ Assess the learner's ability to identify natural and human-made changes and reflect on their significance. Assess the learner's ability to identify the properties of physical change and various processes that cause change in nature. The teacher may design rubrics or checklists to assess the learner and provide necessary help and guidance.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

### **Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=FKfLArLpkIs>

### 3. Separating Mixtures

#### Competencies:

Investigate the separation of mixture using sieve and magnet to understand the need to use appropriate methods in separating mixtures.

#### 3.1 Methods of separation

*(Scope: hand-picking, sieving, winnowing, threshing and magnetic separation).*

#### Objective(s):

- i. Identify physical methods of separating mixtures found in the locality.

#### Learning Experiences:

- **Contact:** The teacher may use an inquiry process to deliver the lesson on the separating of mixtures using appropriate physical methods. The teacher may divide the class into five groups and provide a mixture to each group.
  - ✓ The learner explores physical methods of separating different mixtures from the link <https://byjus.com/chemistry/methods-of-separation/>.
  - ✓ After that the learner identifies the appropriate method and separates the mixture provided to the group.
  - ✓ Each team demonstrates the separation technique to the whole class and explains its significance.
- **Non-contact:** The teacher may share the web link <https://byjus.com/chemistry/methods-of-separation/> that explains the physical methods of separating mixtures on Google Classroom.
  - ✓ The learner gathers information on physical methods of separating mixtures from the link provided.
  - ✓ The learner conducts an experiment on separation of mixture using any physical methods with the help of parents.
  - ✓ The learner video records the experiment and submits through Google Classroom.

**Assessment:****• Contact:**

- ✓ Assess the ability of the learner in identifying the correct physical methods to separate the specific mixtures. Assess the demonstration skills and understanding on the significance of separating methods. The teacher may design rubrics to assess and plan necessary interventions.

**• Non-contact:**

- ✓ Assess the ability of the learner in identifying the correct physical methods to separate the specific mixtures. Assess the processes of the separation in the video record conducted by the learner. The teacher may design rubrics to assess and plan necessary interventions.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://byjus.com/chemistry/methods-of-separation/>

## STRAND: PHYSICAL PROCESS

### 1. Forces and Motion

#### Competencies:

Examine the effects of frictional forces and explore the properties of liquids with different densities to relate its use in the daily activities.

#### 1.1 Frictional Force

*(Scope: concept through activity, identify friction in everyday life, activity on ways to increase and decrease friction [PhET simulation]).*

#### Objective(s):

- i. Investigate the effects of frictional forces on daily life through activity and PhET simulation.

#### Learning Experiences:

- **Contact:** The teacher may use guided inquiry to deliver the concept of friction and its role in daily lives, and how to increase or decrease friction in different situations. The teacher may show a video from the weblink <https://www.youtube.com/watch?v=n2gQs1mcZHA> to introduce the concept of friction. The teacher then provides different situations (or questions) for the learner to explore and design ways of increasing and decreasing friction based on the situation.
  - ✓ The learner in teams discusses and designs a solution to the problem posed by the teacher.
  - ✓ The team lists down the ways of increasing and decreasing the friction for the problem posed by the teacher.
  - ✓ The teams share the findings to the class for discussion.
- **Non-contact:** The teacher may share a video from the web link <https://www.youtube.com/watch?v=n2gQs1mcZHA> to introduce the concept of friction on Google Classroom. The teacher provides different situations whereby the learner is required to design solutions to either increase or decrease friction based on the requirement.



- ✓ The learner designs a solution to the problem posed by the teacher.
- ✓ The learner lists down the ways of increasing and decreasing the friction for the problem posed by the teacher.
- ✓ The learner presents their findings using Google Meet for discussion.

**Assessment:**

- **Contact:**

- ✓ The teacher may observe students during the activity and look at the learner's investigations as well as behavior. The conceptual understanding of the learner on ways of increasing and decreasing friction may be assessed from the findings shared. The teacher may develop a rubric to assess.

- **Non-contact:**

- ✓ Assess the learner's conceptual understanding on ways of increasing and decreasing friction from the findings shared. The teacher may develop a rubric to assess.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=n2gQs1mcZHA>

## 1.2 Floating and Sinking

*(Scope: concept, activities on properties of liquids with different densities).*

**Objective(s):**

- i. Investigate the properties of liquids with different densities through an activity.

### **Learning Experiences:**

- **Contact:** The teacher may use predict, observe and explain (POE) while delivering the content on the properties of liquids with different densities.
  - ✓ The learner predicts which liquid will appear on the top, middle and bottom layer if water, vegetable oil and honey are mixed.
  - ✓ The learner mixes the three liquids in a test tube and records the observation in the form of a diagram with labels.
  - ✓ The learner explains why three liquids appear in three distinct layers.
- **Non-contact:** The teacher instructs the learner on Google Classroom to carry out the following task using predict, observe and explain to learn about the properties of liquids with different densities.
  - ✓ The learner predicts which liquid will appear on the top, middle and bottom layer if water, vegetable oil and honey are mixed.
  - ✓ The learner mixes the three liquids in a test tube and records the observation in the form of a diagram with labels.
  - ✓ The learner explains why three liquids appear in three distinct layers and submit through the Google classroom.

### **Assessment:**

- **Contact:**
  - ✓ Assess the learner's observation during the experiment and diagram. Assess the learner's ability to explain the appearance of liquids in distinct layers in the mixture using the concept of density. The teacher may design and use rubrics and provide necessary help and guidance.
- **Non-contact:**
  - ✓ Assess the learner's diagram and the learner's ability to explain the appearance of liquids in distinct layers in the mixture. The teacher may design and use the rubrics and provide necessary help and guidance.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC

## 2. Energy

### Competencies:

Describe the transformation of energy that takes place in daily life to explain the law of conservation of energy.

### 2.1 Forms of Energy

*(Scope: concept, function, activity on forms [heat, chemical, and potential, kinetic, electrical], and ways to save electricity, things that save energy).*

### Objective(s):

- i. Describe the types and significance of energy in carrying out daily activities.
- ii. Explore various ways to save energy in day to day life by observing and using the internet.

### Learning Experiences:

- **Contact:** To deliver the concept on forms of energy and their significance, the teacher may use Gallery walk. The teacher may display charts with heading like things that move, things that produce heat, things that make sound, and things that produce light, on the wall.
  - ✓ The learner walks around and writes names of some appropriate things that fall under each headings.
  - ✓ The learner discusses different forms of energy listed and their significance in our day to day life in teams.
  - ✓ The learner discusses various ways to save energy and designs a poster.
  - ✓ The teams display the poster on the wall and make a second round of gallery walk to see different ways of saving energy.
- **Non-contact:** The teacher may share the weblink [https://www.youtube.com/watch?v=1JdvH\\_8cz-I](https://www.youtube.com/watch?v=1JdvH_8cz-I) on Google Classroom to deliver the lesson on forms of energy. The teacher may use scientific inquiry to deliver the lesson.

- ✓ The learner watches the video from the web link on the types of energy and their significance posted on Google Classroom.
- ✓ The learner notes down the different forms of energy and their significance in daily life and submits on Google Classroom.
- ✓ The learner identifies ways of saving energy for different forms of energy we use and submit on Google Classroom.

**Assessment:**

• **Contact:**

- ✓ Assess the learner's classifying skill on identifying different forms of energy and their ability to explain the significance of different forms of energy in daily life. Assess the ways of saving energy mentioned in a poster developed by each team. The teacher may design and use their own rubrics and provide intervention accordingly.

• **Non-contact:**

- ✓ Assess the learner's classifying skills on identifying different forms of energy and their ability to explain the significance of different forms of energy in daily life. Assess the ways of saving energy submitted on Google Classroom. The teacher may design and use their own rubrics.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- [https://www.youtube.com/watch?v=1JdvH\\_8cz-I](https://www.youtube.com/watch?v=1JdvH_8cz-I)

## 2.2 Forms of Energy

*(Scope: Law of conservation of energy and the energy transformation)*

### Objective(s):

- i. Describe the transformation of energy to develop the conceptual understanding of the law of conservation of energy.

### Learning Experiences:

- **Contact:** The teacher may post a video weblink, <https://urlshortner.org/SQIdY> that explains the law of conservation of energy. The teacher may use the inquiry process to deliver the lesson.
  - ✓ The learner watches the video from the provided web link and notes down the important information on transformation of energy and law of conservation of energy.
  - ✓ The learner in teams brainstorms and notes down all the different forms of energy in the glowing electric bulb, rotating fan, walking home and bell ringing.
  - ✓ Each team makes a list of energy transformations for all the examples mentioned above.
  - ✓ The team then explains the law of conservation of energy.
  - ✓ The team submits all the assigned tasks on Google Classroom.
  
- **Non-contact:** The teacher may post a video weblink, <https://urlshortner.org/SQIdY> on Google Classroom that explains the law of conservation of energy. The teacher may use the inquiry process to deliver the lesson.
  - ✓ The learner watches the video from the provided web link and notes down the important information on transformation of energy and law of conservation of energy.
  - ✓ The learner brainstorms and notes down all the different forms of energy in glowing electric bulbs, rotating fans, walking home and bell ringing.

- ✓ The learner makes a list of energy transformations for all the examples mentioned above.
- ✓ The learner then explains the law of conservation of energy.
- ✓ The learner submits all the assigned tasks on Google Classroom.

### **Assessment:**

- **Contact:**

- ✓ Assess the learner's ability to identify transformation of energy while performing the task. Assess the learner's conceptual understanding of the law of conservation of energy. The teacher may design and use their own rubrics.

- **Non-contact:**

- ✓ Assess the learner's ability to identify transformation of energy and conceptual understanding of the law of conservation of energy from the work submitted on Google Classroom. The teacher may design and use their own rubrics.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

### **Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://urlshortner.org/SQIdY>

### 3. Electricity and magnetism

#### Competencies:

Investigate the role of conductors and insulators by designing a simple series circuit and explore the properties of magnets based on poles to mend electrical circuits at home and make appropriate use of magnets.

#### 3.1 Generating electricity

*(Scope: hydropower, sources of electricity [water, wind, and solar]).*

#### Objective(s):

- i. Explore different sources of electricity and its significance in leading a healthy life.

#### Learning Experiences:

- **Contact:** The teacher may use a survey/interview to let the learner explore different sources of electricity, its significance and generation of hydroelectricity.
  - ✓ The learner plans and prepares interview questions on sources of electricity with the guidance of the teacher.
  - ✓ The learner carries out interviews in their community and lists down various sources of electricity used in the community.
  - ✓ The learner watches the video from a web link <https://www.youtube.com/watch?v=uAXHMFjpQM> and writes down a brief process of generation of hydroelectricity.
  - ✓ The learner reflects on the significance of electricity in leading a healthy life.
- **Non-contact:** The teacher may use Google Classroom to instruct the learner to design survey/interview questions on sources of electricity, its significance and generation of hydroelectricity.
  - ✓ The learner plans and prepares interview questions on sources of electricity with the guidance of their teacher in Google Classroom.



- ✓ The learner carries out interviews with their parents or guardians and lists down various sources of electricity used in a community.
- ✓ The learner watches the video from a web link <https://www.youtube.com/watch?v=uAXHHMFjpQM> and writes down a brief process of generation of hydroelectricity.
- ✓ The learner reflects on the significance of electricity in leading a healthy life.

### **Assessment:**

- **Contact:**

- ✓ Assess the learner's interview questions before the interview, and communication skills and behaviour during the interview. Assess the learner's explanation of generation of hydroelectricity and the significance of electricity in leading a healthy life. The teacher may design and use their own checklist and plan intervention accordingly.

- **Non-contact:**

- ✓ Assess the learner's interview questions before the interview and information gathering skills after conducting the interview. Assess the learner's explanation of generation of hydroelectricity and the significance of electricity in leading a healthy life. The teacher may design and use their own rubrics.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

### **Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=uAXHHMFjpQM>

### 3.2 Circuits

*(Scope: concept, open and closed circuit, switch, conductor and insulator, activity to construct series circuit)*

#### Objectives:

- i. Construct a series circuit to explain the functions of different parts.

#### Learning Experiences:

- **Contact:** The teacher may use experimental based learning using PhET simulation from the web link <https://urlshortner.org/U4qeB> to deliver the concept of series circuit and to explain the functions of different parts of the circuit.
  - ✓ The learner explores the concept of open and closed circuit, different parts of a circuit, and the role of conductor and insulator from the internet.
  - ✓ The learner uses a PhET simulation from the web link to explore the construction of a series circuit. The learner also explores the closed and open circuit and concept of conductor and insulator using the PhET simulation weblink.
  - ✓ The learner constructs a series circuit using available materials. To identify the insulator and conductor the learner uses different materials as a switch of the circuit.
  - ✓ The learner explains the concept of open and closed circuit, and conductor and insulator using the circuit constructed.
- **Non-contact:** The teacher may post a PhET simulation web link <https://urlshortner.org/U4qeB> on Google Classroom to deliver the concept of series circuit and to explain the functions of different parts of the circuit.
  - ✓ The learner explores the concept of open and closed circuit, different parts of a circuit, and the role of conductor and insulator from the internet.
  - ✓ The learner uses a PhET simulation from the web link to explore the construction of a series circuit. The learner also explores the closed and

open circuit and concept of conductor and insulator using the PhET simulation weblink.

- ✓ The learner explains the concept of open and closed circuit, and conductor and insulator using the PhET simulation and upload on Google Classroom.

**Assessment:**

- **Contact:**

- ✓ Assess the circuit constructed by the learner. During explanation assess the conceptual understanding of open and closed circuit, and conductor and insulator through question answer technique by using appropriate marking schemes. The teacher may develop and use a checklist.

- **Non-contact:**

- ✓ Assess the learners conceptual understanding of open and closed circuit, and conductor and insulator through the work uploaded on the Google Classroom. The teacher may design and use rubrics.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://urlshortner.org/U4qeB>

### 3.3 Static Electricity

*(Scope: activity to explore static electricity).*

**Objective(s):**

- i. Relate effects of static electricity with relevant phenomena observed in the surrounding.

### **Learning Experiences:**

- **Contact:** The teacher may use experiment or demonstration to show certain effects of static electricity in the surrounding.
  - ✓ The learner discusses in a team to understand the effects of static electricity in our surrounding with examples.
  - ✓ The learner observes the demonstration on the effects of static electricity carried out by the teacher using readily available materials like comb, plastic pen and balloon.
  - ✓ The learner repeats the experiments demonstrated by the teacher to explore the effects of static electricity in our surroundings.
  - ✓ The learner notes down some relevant phenomena in surrounding that occurs due to the effect of static electricity.
  
- **Non-contact:** The teacher shares PhET simulations link <https://urlshortner.org/ngBkm> to explore the effects of static electricity.
  - ✓ The learner uses PhET simulation from the link provided above to understand the effects of static electricity.
  - ✓ The learner relates the effects of static electricity with relevant phenomena observed in the surrounding.
  - ✓ The learner notes down some relevant phenomena in surrounding that occurs due to the effect of static electricity.

### **Assessment:**

- **Contact:**
  - ✓ Assess learners' observation skills during the demonstration and understanding of effects of static electricity in our surrounding. The teacher uses their own rubrics or checklist and plans intervention accordingly.
  
- **Non-contact:**
  - ✓ Assess learners' ability to relate the effect of static electricity and understanding of effects of static electricity in our surrounding. The teacher uses their own rubrics or checklist.

- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

#### Resources:

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://urlshortner.org/ngBkm>

### 3.4 Magnet

*(Scope: concept and activities to test the poles of a magnet, like poles and unlike poles).*

#### Objective(s):

- Classify objects based on its magnetic properties.

#### Learning Experiences:

- **Contact:** The teacher may use the following order of activities to deliver the lesson on magnetic properties, and like poles and unlike poles.
  - ✓ The learner uses the link <https://www.youtube.com/watch?v=-aNpmCSZHbk> to explore about magnetic properties and like poles and unlike poles.
  - ✓ The learner lists down examples of magnetic and non magnetic things.
  - ✓ The learner uses magnets to experiment about the repulsion and attraction of the like poles and unlike poles respectively.
  - ✓ The learner extracts and expresses a pattern from their results i.e like poles repel and unlike poles attract.
- **Non-contact:** The teacher may share the videolink, <https://www.youtube.com/watch?v=-aNpmCSZHbk> or any other relevant materials on magnetism, and like poles and unlike poles, on Google Classroom. The teacher may develop a quiz on google form and post on the Google Classroom.

- ✓ The learner explores magnetic properties, like poles and unlike poles from the link given and responds to the quiz questions posted on Google Classroom.

**Assessment:**

- **Contact:**

- ✓ Assess the learner's ability to classify things into magnetic and non-magnetic. Assess the learners ability to explain repulsion and attraction between the like poles and unlike poles respectively. The teacher may design and use a checklist and plan an intervention accordingly.

- **Non-contact:**

- ✓ Assess the learner's conceptual understanding of magnetism, and like poles and unlike poles from the quiz score. The teacher plans appropriate interventions.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=-aNpmCSZHbk>



## 4. Light and Sound

### Competencies:

Investigate the composition and reflection of light and the working of musical instruments responsible for the formation of colour, image and music respectively.

### 4.1 Composition and Properties of Light

*(Scope: activity on composition of white light [Newton's disc], reflection of light [concept and activity]).*

### Objective(s):

- i. Identify the composition and reflection of light in order to relate it to daily activities.

### Learning Experiences:

- **Contact:** The teacher may use the following order of activities to identify the composition of the light and to investigate the reflection of light relating to our daily activities.
  - ✓ The learner explores information on composition of light and reflection of light to form an image from the web link <https://urlshortner.org/qDYIB>
  - ✓ The learner carries out Newton's Disc experiment with the guidance of the teacher (Spinning of Newton's Disc) to show light is composed of seven different colours.
  - ✓ The learner carries out an experiment to show the reflection of light and its significance using a mirror and draw the diagram.
  
- **Non-contact:** The teacher may share the internet link <https://urlshortner.org/qDYIB> on Google Classroom to let the learner identify the composition of the light and to investigate the reflection of light.
  - ✓ The learner explores information on the composition of the light and reflection of light to form images through using the internet link <https://urlshortner.org/qDYIB>.
  - ✓ The learner makes their own Newton's Disc using available materials and carries out an experiment to show light is composed of seven different colours.
  - ✓ The learner carries out an experiment to show the reflection of light and its significance using a mirror and draw the diagram.



- ✓ The learner makes and submits videoclips of the above experiments and uploads on Google Classroom.

**Assessment:**

- **Contact:**

- ✓ Assess the learner's information gathering and observation skills while carrying out experiments. Assess the learner's understanding of composition of light and diagram to check the understanding on the concept of reflection of light and its significance. The teacher may develop and use their own rubrics.

- **Non-contact:**

- ✓ Assess the learner's information gathering skills and the Newton's Disc model. Assess the learner's video to check the understanding of composition of light, reflection of light and its significance. The teacher may develop and use their own rubrics.

- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://urlshortner.org/qDYIB>

## 4.2 Sound

*(Scope: musical sound, concept of volume and pitch through activity, activity on musical instrument and sound production).*

**Objectives:**

- i. Explore the production of sound and music to understand the significance of volume and pitch of sound in conversation and in creating music.

**Learning Experiences:**

- **Contact:** The teacher may use structured inquiry to deliver the lesson on production of sound and music. To introduce the concept of volume and pitch of the sound, the teacher may display the video from the web link,

<https://www.youtube.com/watch?v=wEL87IznGrg>. After watching the video, the teacher may pose a question, 'How is sound produced and how can it be changed?', for the learners to explore in teams.

- ✓ The learner explores how sound is produced in different musical instruments by watching the video from the link provided and records their findings in a tabular form.
- ✓ The learner then investigates on how to change the sound produced by the musical instruments and records their findings in a tabular form.
- ✓ The learner shares the findings to the class and discusses.
- ✓ The learner states the importance of volume and pitch in the daily conversation.

- **Non-contact:** The teacher may post a weblink

<https://www.youtube.com/watch?v=wEL87IznGrg> or any other relevant materials through Google Classroom to deliver the concept of volume and pitch. The teacher may then pose a question, 'How is sound produced and how can it be changed?', for the learners to explore.

- ✓ After watching the video from the Google Classroom, the learner uses different improvised musical instruments like a drinking glass, spoon and elastic bands, or any other available materials to explore how sound is produced in each instrument and record their findings in a tabular form.
- ✓ The learner then investigates on how to change the sound produced by the musical instrument and records their findings in a tabular form.
- ✓ The learner shares their findings on Google Classroom for discussion.
- ✓ The learner states the importance of volume and pitch in daily conversation.

#### **Assessment:**

- **Contact:**

- ✓ The teacher may observe the learner during the observation phases. The teacher may look at the learner's investigations as well as behavior. The conceptual understanding of the learner on how sound is produced and how it can be changed may be assessed from the findings shared. The teacher may develop a rubric for each of these areas.

- **Non-contact:**
  - ✓ The conceptual understanding of the learner on how sound is produced and how it can be changed may be assessed from their findings shared on Google Classroom. The teacher may develop a rubric to assess.
- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- <https://www.youtube.com/watch?v=wEL87IznGrg>

## 5. The Earth, the Moon and the Sun

### Competencies:

Investigate the change in the shape of the moon during a four week lunar cycle to uncover the facts behind local beliefs.

### 5.1 Our Moon.

*(Scope: The moon, phases of moon in different weeks).*

### Objective(s):

- i. Investigate the shape of the moon based on a four week lunar cycle to name the different phases of the moon through observations and using the internet.
- ii. Describe different phases of the moon through different activities to recognize its significance in Bhutanese socio-cultural settings.

### Learning Experiences:

- **Contact:** The teacher may use the following order of activities to let the learner investigate the shape of the moon based on four week phases of the moon. Before a month of this lesson, the teacher may instruct the learner to observe and take photos of the moon and keep record on a daily basis starting from the new moon for a month.
  - ✓ The learner explores and gathers information on a four week cycle of the moon to name its different phases from the web link [https://www.moonconnection.com/moon\\_phases.phtml](https://www.moonconnection.com/moon_phases.phtml)
  - ✓ The learner writes the names and shapes of the different phases of the moon on the photos taken based on the information gathered.
  - ✓ The learner in teams, compares and discusses the names and shapes of the moon recorded by the individual learner.
  - ✓ The learner asks elderly people on the significance of different shapes of the moon in Bhutanese socio-cultural settings and records it.
- **Non-contact:** Before a month of this lesson, the teacher may instruct the learner to observe and take photos of the moon and keep record on a daily basis starting from the new moon for a month. The teacher may

share a simulation link

<https://ccnmtl.github.io/astro-simulations/lunar-phase-simulator/> on a Google classroom.

- ✓ The learner explores and gathers information on a four week cycle of the moon to name its different phases from the internet link, [https://www.moonconnection.com/moon\\_phases.phtml](https://www.moonconnection.com/moon_phases.phtml)
- ✓ The learner writes the names and shapes of the different phases of the moon in the photos taken based on information gathered and uploads on Google Classroom.
- ✓ The learner plays simulation link <https://ccnmtl.github.io/astro-simulations/lunar-phase-simulator/> to further explore and understand the names and shapes of the moon during its different phases in a four week cycle.
- ✓ The learner asks parents or guardians on the significance of different shapes of the moon in Bhutanese socio-cultural settings and records and uploads on Google Classroom.

**Assessment:**

• **Contact:**

- ✓ Assess the learner's ability to name and identify the shapes of the different phases of the moon based on the information collected and the photos taken. Assess the learner's understanding on the significance of the different shapes of the moon in Bhutanese socio-cultural settings. The teacher may design their own rubrics and plan intervention accordingly.

• **Non-contact:**

- ✓ Assess learner's understanding of the different phases of the moon based on the information collected and simulation played by posting certain relevant questions. Assess the learner's understanding on the significance of the different shapes of the moon in Bhutanese socio-cultural settings. The teacher may use their own rubrics and plan intervention accordingly.

- For recording and reporting, refer CFA guide and new normal curriculum framework in science (NNCFS- 2021).

**Resources:**

- REC repository
- Science Textbook for Class V(2020), REC
- Continuous Formative Assessment Guide, Classes PP-VI(2020), REC
- [https://www.moonconnection.com/moon\\_phases.phtml](https://www.moonconnection.com/moon_phases.phtml)
- <https://ccnmtl.github.io/astro-simulations/lunar-phase-simulator/>

