**GRADE 9 RATIONALIZED INTEGRATED SCIENCE SCHEMES OF WORK-TERM 2**

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| **Week** | **Lesson** | **Strand** | **Sub-strand** | **Lesson Learning Outcome** | **Learning Experiences** | **Key Inquiry Question** | **Learning Resources** | **Assessment** | **Reflection** |
| 1 | 1 | Living Things and Their Environment. | Nutrition in Animals: Process of Digestion | By the end of the lesson, the learner should be able to:  -State the meaning of digestion in human beings.  -Use digital or print resources to search for information on the process of digestion in human beings.  -Appreciate the process of digestion in human beings. | In groups,learners are guided to:  -brainstorm and present the meaning of digestion.  -use the digital or print resources to search for information on the process of digestion in human beings.  -identify the organs involved in the process of digestion in human beings.  -discuss the process of digestion in human beings and present in class.  sketch the human digestive system and label the different organs involved. | What is digestion?  Which process are involved in the process of digestion? | Spark Integrated Science pg 77.  Charts.  Lesson notes.  Digital resources. | Written Assessment.  Oral questions.  Oral discussion.  Checklists.  Assessment rubrics. |  |
|  | 2 | Living Things and their Evironment | Nutrition in Animals | By the end of the lesson,the learner should be able to:  -State the roles of the different organs involved in the process of digestion.  -Use digital devices to search and watch video clips on the process of digestion.  -Acknowledge the processes involved in digestion. | In groups,learners are guided to:  -use digital devices to search and watch video clips explaining the process of digestion in human beings.  -individually,take notes on the specific processes and structures involved in each stage of digestion.  -discuss the role of the various organs such as mouth, stomach, small intestines and large intestines. | What are the key steps involved in the process of digestion?  What are the roles of the different organs involved in the process of digestion? | Spark Integrated Science pg 78 & 80.  Digital devices.  Video clips.  Lesson notes. | Assessment rubrics.  Checklists.  Oral discussion.  Oral questions.  Written Assessment. |  |
|  | 3 & 4 | Living Things and their Evironment. | Nutrition in Animals. | By the end of the lesson, the learner should be able to:  -Outline the procedure for demonstrating absorption and digestion using an artificial intestines.  -Carry out an experiment to demonstrate absorption and digestion using an artificial intestine.  -Enjoy carrying out the experiment while observing safety. | In groups,learners are guided to;  -identify the requirements for the experiment.  -outline and discuss the steps to follow in an experiment to demonstrate absorption and digestion.  -collaborate in demonstrating absorption and digestion using an artificial intestine.  -observe and record the observations made from the experiment.  -discuss their observations and present in class. | How do test for starch and reducing sugars? | Spark Integrated Science pg 78-79.  Laboratory.  Beakers, Plastic syringes, iodine solution.  Benedict's solution, droppers & starch suspension. | Observation schedule.  Oral questions.  Checklists.  Portfolios.  Practical Assessment.  Oral discussion. |  |
|  | 5 |  | Nutrition in Animals. | By the end of the lesson, the learner should be able to:  -Explain the meaning of propulsion in the process of digestion.  -Use digital or print resources to search for information on the mechanisms involved in propulsion.  -Value the process of propulsion in digestion of food. | In groups or pairs,learners are guided to;  -explain the meaning of propulsion in the process of digestion.  -use digital devices to search for information on the mechanisms involved in propulsion: peristalsis, segmentation and sphincters.  -take notes on their findings and discuss the findings.  -explain the importance of propulsion in the digestion process. | Why is propulsion important in the digestion of food? | Spark Integrated Science pg 80.  Digital devices.  Lesson notes. | Oral discussion.  Written Assessment.  Checklists.  Assessment rubrics.  Oral questions. |  |
| 2 | 1 |  | Nutrition in Animals.  Self-Assessment. | By the end of the lesson, the learner should be able to:  -Attempt assessment questions on the sub-strand: Nutrition in animals.  -Embrace teamwork as they tackle the questions on the sub-strand. | In groups,pairs or individually,learners are guided to:  -collaborate in answering the assessment questions on the sub-strand; Nutrition in animals. |  | Spark Integrated Science pg 81.  Teacher's Guide. | Assessment rubrics.  Written Assessment.  Learner's Profile. |  |
|  | 2 | Living Things and Their Environment. | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Identify the parts of a flower.  -Draw and label the parts of a flower.  -Appreciate the different parts of a flower. | In groups,learners are guided to:  -brainstorm and present the meaning of reproduction.  -differentiate between sexual and asexual reproduction.  -use digital or print resources to search for pictures of flowers.  -study the pictures and identify the parts of a flower.  -draw and label the parts of a flower on charts and exercise books and display their drawings in class. | How do plants reproduce? | Spark Integrated Science pg 82.  Charts.  Drawing materials.  Digital devices.  Lesson notes. | Assessment rubrics.  Checklists.  Written Assessment.  Oral questions.  Oral discussion. |  |
|  | 3 | Living Things and Their Environment. | Reproduction in Plants. | By the end of the lesson, the learner should be able to:  -Outline the functions of parts of a flower.  -Use digital or print resources to search for information on the parts of the flowers.  -Acknowledge the functions of the different parts of a flower. | In groups or pairs,learners are guided to;  -use print materials or digital devices connected to the Internet to find out information on the parts of a flower and their functions.  -take notes on the functions of the different parts of a flower.  -collaboratively discuss the functions of the parts of a flower.  -present their findings to the class. | What are the functions of the different parts of a flower? | Spark Integrated Science pg 82-84.  Lesson notes.  Digital devices. | Assessment rubrics.  Checklists.  Oral discussion.  Oral questions.  Written Assessment. |  |
|  | 4 & 5 | Living Things and Their Environment. | Reproduction in Plants. | By the end of the lesson, the learner should be able to:  -Outline the procedure for conducting an experiment on scientific observation of the parts of a flower.  -Conduct a practical activity to observe and dissect a flower to find out its parts.  -Observe safety as they carry out the experiment. | In groups,learners are guided through the procedure for carrying out an experiment on observation and dissection of the flower to find out its parts.  -in groups, learners are guided to gather flowers from the school surrounding.  -discuss and identify the various parts of the flowers gathered.  -collaborate in examining how the different parts of the flower are connected.  -in groups,learners to carefully dissect and observe the different parts of a flower.  -record and explain the observations made and then present to the class. | Which part is exposed when the petals are removed? | Spark Integrated Science pg 84-85.  Large Whole Flowers.  Hand lens.  Scissors, razor blades or scapel.  Manilla papers.  Laboratory. | Checklists.  Observation schedule.  Practical Activities.  Assessment rubrics. |  |
| 3 | 1 | Living Things and Their Environment. | Reproduction in Plants. | By the end of the lesson, the learner should be able to:  -State the meaning of pollination.  -Use digital or print resources to search for information on self-pollination.  -Appreciate the process of self-pollination in plants. | In groups,learners are guided to:  -use digital or print resources to search for the meaning of term pollination.  -identify the types of pollination in plants.  -use digital or print resources to search for information on self-pollination and examples of plants that self-pollinate.  -discuss their findings and take short notes on self-pollination.  -study pictures and identify a picture that shows self-pollination.  -sketch a diagram showing self-pollination in plants. | How does reproduction in plants occur?  What is self-pollination? | Spark Integrated Science pg 85-86.  Digital devices.  Lesson notes.  Pictures. | Assessment rubrics.  Checklists.  Oral questions.  Oral discussions.  Written Assessment. |  |
| 2 | Living Things and Their Environment. | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Describe cross-pollination in plants.  -Draw a diagram illustrating cross-pollination in plants.  -Appreciate the cross-pollination in plants. | In groups,learners are guided to;  -use digital and print resources to search for information on cross-pollination.  -discuss their findings on cross pollination and make short notes.  -study pictures in learner`s book or digital device and identify that shows cross pollination.  -sketch a drawing that illustrates cross-pollination in plants. | How does cross-pollination occurs in plants? | Spark Integrated Science pg 85-86.  Lesson notes.  Digital devices.  Pictures. | Assessment rubrics.  Checklists.  Oral discussions.  Oral questions.  Written Assessment. |  |
| 3 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Identify the differences between cross-pollination and self-pollination in plants.  -Use digital or print resources to search for information on the differences between self-pollination and cross-pollination.  -Acknowledge the differences between cross-pollination and self-pollination. | In groups,learners are guided to;  -brainstorm and share the differences between self-pollination and cross-pollination.  -use digital and print resources to search for information on the differences between cross-pollination and self-pollination in plants.  -discuss the differences between self-pollination and cross-pollination in plants and present to the class.  -make a summary table showing the differences between self-pollination and cross-pollination. | What is the difference between cross-pollination and self-pollination? | Spark Integrated Science pg 86.  Lesson notes.  Digital devices.  Manilla papers.  Rulers and Marker pens. | Assessment rubrics.  Checklists.  Oral questions.  Oral discussion.  Written Assessment. |  |
| 4 |  | Reproduction in Plants. | By the end of the lesson, the learner should be able to:  -Identify the agents of pollination in plants.  -Use digital devices to search and watch video clips of the behaviour of the pollinating agents.  -Acknowledge the agents of pollination in plants. | In groups,learners are guided to;  -brainstorm and share on the agents of pollination in plants.  -identify the agents of pollinations.  -classify the agents of pollinations as either biotic or abiotic.  -use digital devices to search and observe the behaviour of pollinating agents.  -take notes on the observed behaviours of the pollinating agents. | What is the difference between biotic and abiotic agents of pollination?  Which agents of pollination do you know? | Spark Integrated Science pg 87-88.  Digital devices.  Internet.  Video clips or animations.  Lesson notes.  Charts. | Assessment rubrics.  Checklists.  Oral questions.  Oral discussions.  Written assessment. |  |
| 5 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Explore pollination agents within the school compound and neighbourhood.  -Have fun in exploring pollination agents within the school compound and neighbourhood | -As a class,learners are guided through the aim and steps for the activity.  -list the requirements for the practical activity.  -in groups,learners to collaborate in observing closely the flowers and any visiting insects,birds or animals using the handlens.  -take notes or sketches of what they see.  -record their observations about the pollinator`s behaviours.  -use digital devices to take photographs to document their observations in a portifolios.  -discuss and share their findings. | What types of pollinators did you observe?  How did the pollinators interact with the flowers? | Spark Integrated Science pg 89-90.  0bservation sheets.  Magnifying glasses.  Cameras.  Digital devices for capturing videos and photos.  School compound. | Observation schedule.  Checklists.  Portifolios.  Practical activity. |  |
| 4 | 1 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson, the learner should be able to:  -Outline the adaptations of flowers to wind pollination.  -Use digital or print resources to search for information on adaptations of flowers to wind.  -Acknowledge the adaptations of flowers to wind pollination. | In groups,learners are guided to;  -brainstorm and present the meaning of adaptations of flowers to wind and insect pollination.  -use print materials or digital devices to search for information on the adaptations of flowers to wind.  -look for details on how the flowers are structured ,what features they have and how the features help in pollination.  -take notes on their findings.  -discuss the adaptations of flowers to wind pollination and present to the class.  -watch a short clips on wind-pollinated flowers. | How are flowers adapted to wind pollination? | Spark Integrated Science pg 90-92.  Lesson notes.  Digital devices.  Video clips.  Internet. | Assessment rubrics.  Checklists.  Written Assessment.  Oral discussions.  Oral questions. |  |
|  | 2 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Outline the adaptations of flowers to insect pollination.  -Use digital or print resources to search for information on adaptations of flowers to insect pollination.  -Acknowledge the adaptations of the flowers to insects. | In groups,learners are guided to;  -use digital or print media to search for information on the adaptations of flowers to insect pollination.  -identify the adaptations of flowers to insect pollination and take short notes in exercise books.  -discuss the adaptations of flowers to insect pollination and present to the class.  -use digital devices to watch video clips on insect-pollinated flowers. | How are flowers adapted to insect pollination? | Spark Integrated Science pg 92-93.  Lesson notes.  Digital devices  Internet.  Video clips. | Assessment rubrics.  Checklists.  Oral questions.  Oral discussions.  Written Assessment. |  |
|  | 3 & 4 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Study samples of flowers that exhibit adaptations to agents of pollinations.  -Draw and label wind-pollinated and insect-pollinated flowers.  -Show interest and curiousity in studying samples of wind and insect-pollinated flowers. | -As a class ,learners are guided through the aim and steps for the practical activity.  -in groups,learners to collaborate in gathering samples of flowers that exhibit adaptations to agents of pollinationnsuch as wind and insect-pollinated flowers.  -observe the flowers closely and take note of the structures,shapes,colours and any other outstanding features.  -discuss the adaptations observed from the samples of flowers.  -take turns in drawing diagrams of the flowers observed.  -label the different parts of the flowers that are relevant to their adaptations for pollination.  -display their drawings in class for assessment and feedback. | Which adaptations did you notice serve to attract insects I insect-pollinated flowers?  Which adaptations did you notice that aid in dispersing pollen through the air? | Spark Integrated Science pg 93.  Samples of wind-pollinated and insect-pollinated flowers.  Laboratory  Drawing materials;pencil,papers,manillas and marker pens. | Assessment rubrics.  Checklists  Oral questions.  Oral discussion  Observation schedule.  Practical activity. |  |
|  | 5 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -State the meaning of agrochemicals.  -Use digital devices to search for information on the effects of agrochemicals on pollinating agents and reproduction in plants.  -Acknowledge the effects of agrochemicals on pollinating agents and reproduction in plants. | In groups,learners are guided to;  -brainstorm and present the meaning of agrochemicals.  -give examples of agrochemicals.  -use digital devices to search for information on the effects of agrochemicals on pollination agents and its effects on reproduction of plants.  -take notes of their findings in books.  -discuss the effects of agrochemicals on pollination agents and its effects on reproduction of plants.  -present their findings in class. | What are some effects of agrochemicals on pollinating agents?  How do agrochemicals impact plant reproduction? | Spark Integrated Science pg 94.  Lesson notes.  Digital devices.  Internet. | Assessment rubrics.  Written Assessment.  Oral questions.  Oral discussion. |  |
| 5 | 1 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson, the learner should be able to:  -Describe fertilization and seed formation in flowering plants.  -Use digital devices or print resources to search for information on fertilization and seed formation in flowering plants.  -Acknowledge the process of fertilization and seed formation in flowering plants. | In groups,learners are guided to;  -use digital devices or print resources to search for information on fertilization and seed formation in flowering plants.  -discuss the process of fertilisation and seed formation in flowering plants and present their findings in class.  -collaboratively study illustrations or clips on fertilization and seed formation. | How does fertilization and seed formation occur in plants? | Spark Integrated Science pg 95-96.  Digital devices.  Lesson notes.  Video clips.  Pictures. | Assessment rubrics.  Checklists.  Written Assessment.  Oral discussion.  Oral questions. |  |
| 2 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Describe fruit formation in flowering plants.  -Use digital or print resources to search for information on fruit formation in flowering plants.  -Acknowledge the steps involved in fruit formation in flowering plants. | In groups,learners are guided to;  -explain the meaning of fruit formation in flowering plants.  -Use digital devices or print media to search for information on the process of fruit formation in flowering plants.  -discuss the process of fruit formation in flowering plants and present in class.  -make short notes on the process of fruit formation in flowering plants.  -watch short clips on the process of fruit formation. | How does fruit formation occur in flowering plants? | Spark Integrated Science pg 97-98.  Digital devices.  Lesson notes.  Video clips. | Assessment rubrics.  Written Assessment.  Oral discussion.  Oral questions. |  |
| 3 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Explain the significance of fertilization and fruit formation in flowering plants.  -Use digital devices or print media to search for information on significance of fertilization and fruit formation.  -Value the process of fertilization and fruit formation in plants. | In groups,learners are guided to;  -brainstorm and share the importance of fertilization and fruit formation in plants.  -use digital or print resources to search for information on the significance of fertilization and fruit formation.  -discuss the significance of fertilization and fruit formation in plants.  -take short notes on the significance of fertilization and fruit formation in plants. | Why is fertilization and fruit formation important? | Spark Integrated Science pg 98.  Lesson notes.  Digital devices. | Written Assessment.  Oral questions.  Assessment rubrics.  Checklists.  Oral discussion. |  |
| 4 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson, the learner should be able to:  -Describe the modes of seed and fruit dispersal in plants.  -Use digital or print resources to search for information on the wind and water modes of seed and fruit dispersal.  -Appreciate the different modes of seed and fruit dispersal. | In groups,learners are guided to;  -explain the meaning of fruit and seed dispersal.  -identify the modes of fruit and seed dispersal.  -discuss the wind and water modes of seeds and fruit dispersal.  -search for examples of seeds and fruit dispersed by wind and water modes. | Which modes of seed and fruit dispersal do you know? | Spark Integrated Science pg 100-101.  Digital devices.  Lesson notes.  Flashcards. | Assessment rubrics.  Checklists.  Written Assessment.  Oral questions.  Oral discussion. |  |
| 5 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Identify the modes of fruit and seed dispersal.  -Use digital or print resources to search for information on animal and self-dispersal modes of fruit and seed dispersal.  -Appreciate the different modes of seed and fruit dispersal. | In groups,learners are guided to;  -use digital or print resources to search for information on animal and self-dispersal.  -discuss the animal and self-explosion modes of fruit and seed dispersal.  -give examples of seeds and fruits dispersed through self-explosion and animal dispersal. | Which seeds and fruits are dispersed by animals and self-explosion? | Spark Integrated Science pg 101-102.  Digital devices.  Lesson notes. | Assessment rubrics.  Written assessment.  Oral questions.  Oral discussion. |  |
| 6 | 1 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson, the learner should be able to:  -Collect various fruits and seeds in the locality.  -Categorise the fruits and seeds based on their mode of dispersal.  -Enjoy categorizing the locally available fruits and seeds based on mode of dispersal. | In groups,learners are guided to;  -collect the different fruits and seeds from their locality.  -observe the collected the collected fruits and seeds.  -discuss and categorise the fruits and seeds collected based on their mode of dispersal.  -present their findings in class. | Which fruits and seeds are found in your locality? | Spark Integrated Science pg 103.  Fruits and seeds.  School and the surrounding environment.  Lesson notes. | Assessment rubrics.  Practical Activities.  Portifolios.  Checklists.  Observation schedule. |  |
| 2 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -State the importance of fruit and seed dispersal in the environment.  -Use digital or print resources to search for information on the importance of seed and fruit dispersal in the environment.  -Acknowledge the importance of seed and fruit dispersal in the environment. | In groups,learners are guided to;  -brainstorm and present the importance of seed and fruit dispersal in the environment.  -use digital devices or print resources to search for information on the importance of seed and fruit dispersal in the environment.  -discuss the importance of seed and fruit dispersal in the environment. | What is the importance of fruit and seed dispersal in the environment? | Spark Integrated Science pg 100.  Lesson notes.  Digital devices. | Written Assessment.  Checklists.  Assessment Rubrics.  Oral questions.  Oral discussion. |  |
| 3 | Living Things and Their Environment | Reproduction in Plants. | By the end of the lesson,the learner should be able to:  -Identify the roles of flowers in nature.  -Use digital or print resources to search for information on role of flowers in nature.  -Recognize the role of flowers in nature. | In groups,learners are guided to;  -brainstorm and present the roles of flowers in nature.  -use digital or print resources to search for information on the roles of flowers in nature.  -discuss the roles of flowers in nature and present in class.  -take a walk around the school compound to observe and appreciate the diverse beauty and role of flowers | What is the role of flowers in nature?  What is it important to protect flowers and their pollinators? | Spark Integrated Science pg 102-103.  Lesson notes.  Digital devices.  School environment. | Assessment rubrics.  Written Assessment.  Checklists.  Observation schedule.  Oral questions.  Oral discussion. |  |
| 4 | Living Things and Their Environment | Reproduction in Plants.  Assessment. | By the end of the lesson, the learner should be able to:  -Attempt assessment questions on the sub-strand. | In pairs or individually,learners are guided to;  -answer the assessment questions on the sub-strand. |  | Spark Integrated Science pg 104.  Assessment questions. | Written Assessment.  Checklists.  Learner`s profile. |  |
| 5 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -State the meaning of biotic components of the environment.  -Use digital or print resources to search for information on biotic interrelationship.  -Acknowledge the different types of biotic interrelationships. | In groups,learners are guided to;  -explain the meaning of biotic components and give examples.  -study pictures of different animals and identify how the animals depend on each other.  -discuss the meaning of biotic interrelationships.  -use digital devices or print resources to search for information on the different types of biotic interrelationships.  -describe the herbivory,parasitism,mutualism,saprophytism,predation and competition biotic interrelationships. | What are biotic components of the environment?  What is the role of living factors in environment? | Spark Integrated Science pg 105-106.  Digital devices.  Lesson notes.  Pictures. | Assessment rubrics.  Checklists.  Written assessment.  Oral discussion.  Oral question. |  |
| 7 | 1 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson, the learner should be able to:  -Identify the biotic interrelationship in the environment.  -Investigate the interrelationships between biotic factors of the environment in their locality.  -Observe safety as they conduct the activity. | In groups,learners are guided to;  -walk around the school environment and observe the biotic factors present.  -collaborate in investigating the interrelationships between biotic factors of the environment in their environment.  -take notes on the interactions and relationships observed between the organisms and their environment.  -use digital devices to search for information on the roles of the organisms in the ecosystem and how they interact with one another. | How do the organisms in the environment interact with one another? | Spark Integrated Science pg 107.  School environment.  Magnifying glasses.  Cameras.  Digital devices.  Pens & notebooks. | Practical Activity.  Oral discussion.  Oral question.  Checklists.  Observation schedule. |  |
|  | 2 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to;  -State the meaning of abiotic components of the environment.  -Use digital or print resources to search for information on the abiotic components of the environment.  -Acknowledge the abiotic components of the environment. | In groups,learners are guided to;  -explain the meaning of abiotic components of the environment.  -identify the examples of abiotic components of the environment.  -use digital or print resources to search for information on the abiotic components of the environment.  -discuss the abiotic components of the environment | What are the abiotic components of the environment?  What is the role of non-living factors in the environment? | Spark Integrated Science pg 108-109.  Lesson notes.  Digital devices. | Assessment rubrics.  Oral discussions.  Oral question.  Written Assessment. |  |
|  | 3 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -Identify the abiotic components of the environment.  -Use digital devices to search for information on the effects of abiotic factors on living organisms.  -Acknowledge the effects of abiotic factowhrs on living organisms. | In groups,learners are guided to;  -mention the abiotic components of the environment.  -use digital or print resources to search for information on the effects of abiotic factors on living organisms.  -discuss the effects of abiotic factors on living organisms. | What are the effects of abiotic factors on living things? | Spark Integrated Science pg 108-109.  Lesson notes.  Digital devices. | Written Assessment.  Oral question.  Oral discussions.  Assessment rubrics. |  |
|  | 4 & 5 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson, the learner should be able to:  -Outline the procedure for demonstrating the effects of light,temperature,wind and pH on plants.  -Carry out an experiment to demonstrate the effects of light,temperature,wind and pH on plants.  -Embrace teamwork in carrying out the experiment. | In groups,learners are guided to;  -identify and prepare the requirements for the experiment.  -outline and discuss the procedure for demonstrating the effects of light,wind,temperature and Ph on plants.  -carry out an experiment to demonstrate the effects of light,wind,temperature and pH on plants.  -record the observations from the experiment.  -discuss their observations and present in class. | What is your conclusion on how light,temperature and wind affect plants? | Spark Integrated Science pg 109-111.  Water.  Electric bulbs of different colours.  Metre rule.  Glass funnel.  Sodium hydrogen carbonate.  Text-tubes.  Stands & two paper clips.  Dilute hydrochloric acid.  Sodium hydroxide solution.  Water plant.  Beaker,thermometer & straw.  Source of heat.  Laboratory. | Demonstrations.  Checklists.  Observation schedule.  Assessment rubrics. |  |
| 8 | **MID-TERM BREAK** | | | | | | | | |
| 9 | 1 & 2 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson, the learner should be able to:  -Outline the procedure for demonstrating the effect of light, temperature,wind and humidity on plants.  -Carry out an experiment to demonstrate the effect of light, temperature,wind and humidity on plants.  -Acknowledge the effect of light, temperature,wind and humidity on plants. | In groups,learners are guided through the procedure for demonstrating the effect of light, temperature,wind and humidity on plants.  -In groups,learners are guided to prepare the requirements for the experiment and set-up the experiment.  -Collaborate in carrying out an experiment to demonstrate the effect of light, temperature,wind and humidity on plants.  -Observe and record their observations on the experiment.  -discuss their findings and present their conclusions. | What is your conclusion on how light, temperature and wind affect plants? | Spark Integrated Science pg 111-112.  Fresh leafy shoot of the herbaceous plant.  Potometer.  Water, Jelly and Beakers.  Scalpel, Rulers.  Retort stand.  Water trough.  Laboratory.  Electric bulbs of different colours.  Polythene bag. | Assessment rubrics.  Checklists.  Experiments.  Observation schedule.  Oral discussion.  Oral questions. |  |
|  | 3 & 4 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -Outline the procedure for demonstrating for effect of soil pH and fertility on plants.  -Carry out an experiment to demonstrate the effect of soil pH and fertility on plants.  -Acknowledge the effects of soil pH and fertility on plants. | -In groups, learners are guided through the procedure to demonstrate the effect of soil pH and fertility on plants.  -In groups,learners are guided to prepare the requirements and set-up the experiment.  -collaborate in carrying out an experiment to demonstrate the effect of soil pH and fertility on plants.  -observe and record their observations.  -discuss their findings and present their conclusions. | How does deficiency of soil fertility and pH affect plants? | Spark Integrated Science pg 113-114.  Bean seeds.  Blotting papers or newspapers.  Distilled water.  Beaker.  Measuring cylinder.  Laboratory.  Potassium Nitrate.  Magnesium sulphate.  Potassium phosphate.  Calcium nitrate.  Iron (III) chloride. | Experiments.  Checklists.  Oral discussion.  Oral questions.  Observation schedule. |  |
|  | 5 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -Outline the procedure for demonstrating the effect of light and humidity on animals.  -Carry out an experiment to demonstrate the effect of light and humidity on animals.  -Acknowledge the effect of light and humidity on animals. | -In groups, learners are guided through the procedure for demonstrating the effect of light and humidity on animals.  -in groups, learners are guided to prepare the requirements and set-up the experiment.  -collaborate in conducting the experiment to demonstrate the effect of light and humidity on animals.  -observe and record the observations made from the experiment.  -discuss their findings and present their conclusions. | How does light and humidity affect animals? | Spark Integrated Science pg 113.  Petri dishes.  Woodlice.  Plasticine.  Wax.  Cellotape.  Dark cloth.  Wet humus. | Experiments.  Assessment rubrics.  Checklists.  Observation schedule.  Oral questions.  Oral discussion. |  |
| 10 | 1 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson, the learner should be able to:  -State the meaning of energy flow in an ecosystem.  -Use digital or print resources to search for information on living things and what they feed on.  -Acknowledge the different living organisms and what they feed on. | In groups,learners are guided to:  -explain the meaning of energy flow.  -collaborate in mentioning the different living organisms in the environment.  -use digital devices to search and identify what the mentioned living organisms feed on and note down.  -use digital devices to search for the meaning of producer, primary consumer, secondary consumer and tertiary consumer in relation to an ecosystem.  -discuss the meaning of producer, primary consumer, secondary consumer and tertiary consumer giving relevant examples.  -walk around the school environment and identify the different living organisms and what they feed on. | What is energy flow in an ecosystem?  What is the meaning of producer, primary, secondary and tertiary consumer in an ecosystem? | Spark Integrated Science pg 117-118.  Digital devices.  Lesson notes.  School environment. | Oral questions.  Oral discussion.  Written Assessment.  Checklists.  Assessment rubrics. |  |
|  | 2 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -Differentiate between food web and food chain.  -Identify the producer, primary,secondary and tertiary consumer in food chains and food webs.  -Acknowledge the significance of food chains and webs in an ecosystem. | In groups,learners are guided to:  -use digital or print resources to search for the meaning of food chain and food web.  -discuss the differences between a food chain and food web using a relevant example.  -study different pictures from the internet or books and identify those that shows the food webs and food chains.  -Guide learners in studying and identifying the producer, primary consumer, secondary consumer and tertiary consumer from the food chains and food webs.  -learners to present their findings in class. | What is the difference between food chain and food web? | Spark Integrated Science pg 119-120.  Charts with food chains and food webs.  Digital devices.  Lesson notes.  Pictures of food chains and food webs. | Assessment rubrics.  Checklists.  Written Assessment.  Oral questions.  Oral discussion.  Rating scale. |  |
|  | 3 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -Outline the steps for constructing a food chain in an ecosystem.  -Construct food chains in an ecosystem.  -Enjoy constructing food chains. | In groups,learners are guided through the steps for constructing simple food chains.  -learners to observe keenly as the teacher illustrates how to construct food chains.  -in groups, pairs or individually,learners to collaborate in constructing food chains in exercise books and manilla papers.  -learners to present their constructed food chains in class for assessment and feedback. | How do you construct a food chain? | Spark Integrated Science pg 119.  Charts showing food chains.  Digital devices.  Chalkboard and chalks.  Lesson notes. | Assessment rubrics.  Written Assessment.  Oral questions.  Oral discussion.  Learner's profile.  Rating scale.  Portfolios. |  |
|  | 4 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson, the learner should be able to:  -Outline the steps for constructing a food web.  -Construct food webs in the ecosystem.  -Enjoy constructing food webs from given ecosystems. | -In groups,learners are guided through the steps for constructing a food web.  -Learners to observe the teacher as he/she illustrates how to construct food webs given information from an ecosystem.  -in groups or pairs, learners to study information from given ecosystems.  -in groups or pairs,learners to collaborate in constructing food webs from the given information on manilla papers and exercise books.  -learners to present their constructed food webs in class for assessment. | How do we construct a food web? | Spark Integrated Science pg 119.  Charts showing food webs.  Lesson notes.  Chalkboard and Chalks.  Manilla papers. | Assessment rubrics.  Checklists.  Written Assessment.  Oral questions.  Illustrations.  Portfolios.  Rating scales.  Oral discussion. |  |
|  | 5 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -Describe the effects of human activities on the environment.  -Use digital or print resources to search for information about the effects of human activities on the environment.  -Acknowledge the effects of human activities on the environment. | In groups,learners are guided to:  -brainstorm and present the different human activities that interfere with the ecosystem.  -collaborate in searching for information on the effects of human activities on the environment.  -learners to individually take notes on their findings.  -collaborate in discussing the effects of human activities on the environment and present their findings in class.  -outline ways we can reduce the negative effects of human activities on the environment. | What are the effects of human activities on the environment?  How can we reduce the negative effects of human activities on the environment? | Spark Integrated Science pg 120.  Lesson notes.  Digital devices. | Oral questions.  Checklists.  Assessment rubrics.  Written Assessment.  Oral discussion. |  |
| 11 | 1 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson, the learner should be able to:  -Define the term decomposers.  -Use digital devices and print resources to research on the role of decomposers in an ecosystem.  -Appreciate the role of decomposers in an ecosystem. | In groups,learners are guided to:  -brainstorm and present the meaning of decomposers.  -search the internet or textbooks for information on the role of decomposers in the ecosystem.  -learners to note down their findings.  -discuss the role of decomposers in an ecosystem and present their findings. | What is the role of decomposers in an ecosystem? | Spark Integrated Science pg 121-122.  Lesson notes.  Digital devices | Assessment rubrics.  Checklists.  Written Assessment.  Oral questions.  Oral discussion. |  |
|  | 2 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -State the importance of decomposers in recycling nutrients.  -Use digital or print resources to search for information on the importance of decomposers in recycling nutrients.  -Acknowledge the importance of decomposers in recycling nutrients. | In groups,learners are guided to;  -use digital devices to search for information on the importance of decomposers in recycling nutrients.  -dicuss the importance of decomposers in recycling nutrients.  -learners to present their findings in class. | What is the importance of decomposers in recycling nutrients? | Spark Integrated Science pg 121-122.  Lesson notes.  Digital devices. | Assessment rubrics.  Checklists.  Written Assessment.  Oral questions.  Oral discussion. |  |
|  | 3 & 4 | Living Things and Their Environment | The Interdependence of Life. | By the end of the lesson,the learner should be able to:  -Outline the steps for carrying out an experiment on identifying role of decomposers in an ecosystem and their importance in recycling nutrients.  -Carry out experiments to investigate the role of decomposers in an ecosystem and their importance in recycling nutrients.  -Enjoy carrying out the experiment. | -In groups,learners are guided through the procedure for an experiment to identify the role of decomposers in an ecosystem and their importance in recycling nutrients.  -learners are guided to prepare the necessary requirements for the experiment.  -In groups,learners to collaborate in conducting the experiments to identify the role of decomposers in an ecosystem and their importance in recycling nutrients.  -learners to observe their experiments after a week and two weeks and record their observations.  -learners to discuss their observations and present their conclusion. | What happened to the slices of bread and ugali used after the two weeks? | Spark Integrated Science pg 121.  Slices of bread.  Pieces of ugali.  2 Petri dishes.  Hand lenses.  Water.  Polythene paper. | Practical Activities.  Checklists.  Oral presentation.  Observation schedule. |  |
|  | 5 | Living Things and Their Environment | The Interdependence of Life.  Assessment. | By the end of the lesson,the learner should be able to:  -Attempt Assessment questions on the sub-strand. | In pairs or individually,learners are guided to answer the questions on the sub-strand: The Interdependence of Life. |  | Spark Integrated Science pg 122-124.  Teacher's Guide. | Assessment rubrics.  Checklists.  Written Assessment. |  |
| 12 | 1 | Force and Energy. | Curved Mirrors. | By the end of the lesson, the learner should be able to:  -Identify the different types of curved mirrors.  -Use digital devices to search for information on the types of mirrors.  -Acknowledge the different types of mirrors used in our day to day lives. | In groups,learners are guided to:  -brainstorm and present the meaning of mirrors.  -identify the types of curved mirrors.  -use digital devices or print resources to search for information on the concave mirrors,convex mirrors and parabolic mirrors.  -note down their findings in exercise books.  -describe the different types of curved mirrors: concave,convex, parabolic mirrors.  -use digital devices to watch video clips on the different curved mirrors. | Which types of curved mirrors do you know? | Spark Integrated Science pg 125-126.  Digital devices.  Video clips.  Lesson notes.  Pictures.  Spoons. | Assessment rubrics.  Checklists.  Oral discussion.  Written Assessment. |  |
|  | 2 | Force and Energy | Curved Mirrors | By the end of the lesson,the learner should be able to:  -Identify the terms associated with the curved mirrors.  -Use digital or print resources to search for information on the terms associated with the curved mirrors.  -Acknowledge the terms associated with the curved mirrors. | In groups,learners are guided to:  -use digital devices to search and watch video clips on curved mirrors.  -identify the terms associated with the curved mirrors from the video clips.  -use digital or print resources to search for information on the meaning of the different terms associated with curved mirrors.  -discuss the terms used in the curved mirrors and present in class. | What are the terms associated with the curved mirrors? | Spark Integrated Science pg 127-128.  Lesson notes.  Digital devices.  Video clips. | Assessment rubrics.  Checklists.  Oral discussion.  Oral questions.  Written Assessment. |  |
|  | 3-5 | **REVISION** | | | | | | | |
| 13 | **END OF TERM 2 ASSESSMENT** | | | | | | | | |
| 14 | **END OF TERM 2 BREAK.** | | | | | | | | |