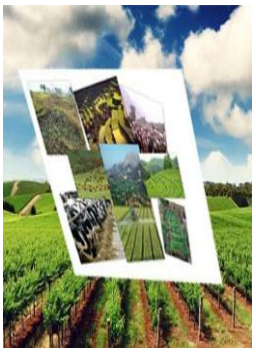
BASIC 8

WEEKLY LESSON PLAN – WEEK 3

Strand:	Systems	**Sub-Strand:**	Farming Systems		
Content Standard:	B8.3.4.1 Demonstrate understanding of the different crop, animal and land combinations under various farming systems				
Indicator (s)	B8.3.4.1.1 Identify and describe the types of crops, animals and land combinations for the different farming systems B8.3.4.1.2 Discuss the usefulness of the different crops and animals involved in the different farming systems.	**Performance Indicator:** Learners can identify the benefits of farming systems			
Week Ending	26-01-2024				
Class	B.S.8	**Class Size:**		**Duration:**	
Subject	Science				
Reference	Science Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.				
Teaching / Learning Resources	Poster, Pictures, Video	**Core Competencies:**	• Communication and Collaboration • Critical thinking and Problem Solving • Digital Literacy		

DAY/DATE	**PHASE 1 : STARTER**	**PHASE 2: MAIN**	**PHASE 3: REFLECTION**
MONDAY	Discuss with the Learners about the meaning of "Farming System".	1. Assist Learners to identify the types of farming systems practiced in their community. 2. Learners brainstorm to describe the characteristics of each type of farming system. 3. Describe with the learners about the types of crops, animals and land combinations in the different farming systems in your community. **Types of Farming** Farming can be classified (grouped) according to what it grows and how it is grown • Arable: Crops • Pastoral: Animals • Mixed: Crops and animals • Subsistence: Grown just for the farmer and his family • Commercial: Grown to sell • Intensive: High inputs of labour or capital ususally small • Extensive: Low inputs of labour or capital • Sedentary: Permanently in in one place	Reflect on the types of farming systems. **Exercise;** State and explain 5 types of farming systems.

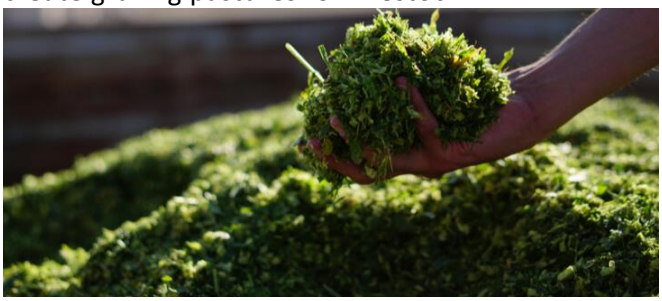
		• Nomadic: The farmers move around to find new areas to farm   • Farming involves rearing of animals and crop cultivation; it is an important part of agriculture. • Farmers aim at providing enough, healthy food to feed the ever-increasing population worldwide. • Different types of farming practices are practiced in different regions across the world based on various factors. • Factors such as climate and soil fertility affect the type of farming practices a farmer can adopt. • Types of farming include subsistence farming, mixed farming, nomadic herding, commercial plantation, livestock rearing, etc.	
THURSDAY	Discuss specialized farming practices, such as organic farming, aquaculture, and agroforestry with the Learners.	1. Assist Learners to identify the advantages and disadvantages of the various farming systems. 2. Learners in small groups to discuss and report to the class about the benefits and challenges of organic farming, aquaculture, and agroforestry 3. Learners brainstorm to explain how the choice of farming type impact food security, environmental sustainability, and rural livelihoods. 4. Discuss with the Learners about the general advantages of all farming systems. **Benefits or Advantages of Integrated Farming System** **1) Productivity:** IFS provides an opportunity to increase economic yield per unit area per unit time by virtue of intensification of crop and allied enterprises. **2) Profitability:** Use waste material of one component at the least cost. Thus reduction of cost of production and form the linkage of utilization of waste material, elimination of middleman interference in most input used. Working out net profit B/ C ratio is increased. **3) Potentiality or Sustainability:** Organic supplementation through effective utilization of by products of linked component is done thus providing an opportunity to sustain the potentiality of production base for much longer periods.	Assist Learners to identify considerations for promoting sustainable farming practices? **Exercise;** State 5 advantages of benefits of farming systems.

		4) Balanced Food: We link components of varied nature enabling to produce different sources of nutrition. **5) Environmental Safety:** In IFFS waste materials are effectively recycled by linking appropriate components, thus minimize environment pollution. **6) Recycling:** Effective recycling of waste material in IFFS. **7) Income Rounds the year:** Due to interaction of enterprises with crops, eggs, milk, mushroom, honey, cocoons silkworm. Provides flow of money to the farmer round the year.	
FRIDAY	Learners brainstorm to identify types of crops based on their uses.	1. Using a Chart, explain how to classify crops based on their life cycles. 2. Explain how the different components of farming systems contribute to each other. 3. Learners in small groups to discuss and report to the class and write down the contributions of crops and animals towards the sustainability of each farming system **Types Of Crops Based On Their Uses** Rather than being a precise scientific classification of plants, this list of crop types describes their uses and economic value. Based on the intended use, there are 6 types of crops: food, forage, fiber, oil, ornamental, and industrial. **Food Crops** Food plants were historically the first to be harvested and cultivated. They are grown for human consumption. Food plants, particularly grains, are strategically important. At the same time, farmers should keep in mind that while industrial food plant cultivation has many benefits, it can also have negative environmental consequences, such as greenhouse gas (GHG) emissions. The following are the types of food crops. **Cereals**: wheat, rice, barley, millet, oats, rye, sorghum, and others. Grains are a rich source of starch, protein, dietary fiber, and nutrients and are an integral part of the daily diet. In particular, maize, rice, and wheat provide the most calories and protein consumed in developing countries. *There's a significant influence of crop type on nitrous oxide emissions. With over 1.2 billion metric tons produced, maize is the most important grain, while also being the main source of GHG emissions from farming. Primarily, agricultural activities related to* ***growing maize contribute to N2O emissions*** *in the following ways: overapplication of manure and synthetic fertilizers; cultivation of nitrogen-*	Through questions and answers, conclude the lesson. **Exercise;** Explain the different components of farming systems contribute to each other

		fixing plants; inadequate drainage, increasing soil saturation; tillage, releasing nitrogen residues; excessive irrigation. **Seeds** include several types of field crops, such as *cereals, nuts, legumes, and some spices*. Seeds are high in fiber, fats, vitamins, minerals, and antioxidants.  **Fruits**: *apples and pears, citrus, stone fruits, tropical and exotic fruits, berries, and other types*. Fruits contain a lot of dietary fiber, vitamins, minerals, and antioxidants, such as flavonoids, which promote good health. **Vegetables** are high in water content and low in calories. They are also rich in dietary fiber, antioxidants, minerals, and vitamins (especially A and C). There are several types of vegetable crops: • root vegetables: *beets, carrots, sweet potatoes, turnips*; • tubers: *potatoes, yams*; • stem vegetables: *asparagus, kohlrabi, celery*; • leafy green: *lettuce, spinach, silverbeet*; • allium or bulb vegetables: *garlic, leeks, onions, shallots*; • head or flower vegetables: *artichokes, cabbage, cauliflower*; • cucumber family vegetables: *pumpkin, cucumber, zucchini*. Spices fall into three types: the *spices* themselves (pepper, ginger), *spice seeds*, and *herbs*. Spices are used sparingly to enhance food flavor and aroma. They contain essential oils and alkaloids that aid appetite and digestion. **Forage Crops** Forage, aka feed, plants contain nutrients that animals require for development. They are grown for livestock consumption and are essential in **pasture management**. Some of the most crucial types of forage crops are *sorghum, alfalfa, barley, oats, millet, soybeans, wheat, and maize*. Forage is classified into two types based on how it is processed: • **hay** is forage that has been cut, dried in the field, and stored;	

- **silage** is produced by harvesting the plants and storing them in conditions that allow them to be split (fermented) into acids. Types of silage crops include perennial and annual grasses and legumes.

With increased global demand for meat, forage production has skyrocketed. Higher forage production has altered the agricultural landscape, causing massive deforestation to create grazing pastures for livestock.



Fiber Crops

Plants grown to produce fiber for textiles, cordage, filling, and paper are known as a fiber type of crops. The well-known fiber plants are *cotton, hemp, jute, kenaf, and flax*. Some of them have a good prospect as agricultural biomass with the potential of being converted to ethanol.

Oil Crops

Thanks to **technological advances in agruculture** over the last century, plants can be processed and broken down into their primary components, including oil. Today, the oil type of crops is the second most important determinant of the agricultural economy (after cereals) and is the third largest user of farmland .

The essential plants of this type are *soybeans, sunflower seeds, rapeseed, canola, and peanuts*. They are high in oils, dietary fibers, proteins, minerals, and vitamins. Apart from producing oil for human consumption, this type of plants is used in various industries, including soaps, paints, machinery lubricants, fuel, and many more.

Oil plants also supply the raw materials for biodiesel production. *Soybean, rapeseed, sunflower, camelina, and palm* are typical biodiesel sources. Due to palm trees' high yield potential, the **palm oil cultivation** industry is constantly expanding.

Ornamental Crops

Plants grown for decorative purposes in parks, gardens, and landscaping design projects are related to the ornamental

type. *Ivy, oleander, holly, tulips, and azaleas* are common decorative plants.

Industrial Crops

Industrial plants are grown for profit and industrial use. They are also referred to as cash or commercial type of crops and include *cotton, jute, sugarcane, sugarbeet, coffee, tea, tobacco, coconut, and soybeans*.

As you may have noticed, the same plant can belong to multiple types in the classification by use. For example, wheat and oats can be food or forage types. Sugarcane provides both edible sugar and alcohol for bioethanol production. There are, of course, exceptions. Let's say that most decorative flowers are as poisonous as they are beautiful

Crops By Life Cycle

Each crop goes through a series of stages of plant growth, from germination to seed production. The total duration of all these stages, namely the life cycle, varies between plants. So, according to their life cycles, what are these types of crops? There are 3 types: annual, biennial, and perennial, which we'll look into further.

Annual Plants

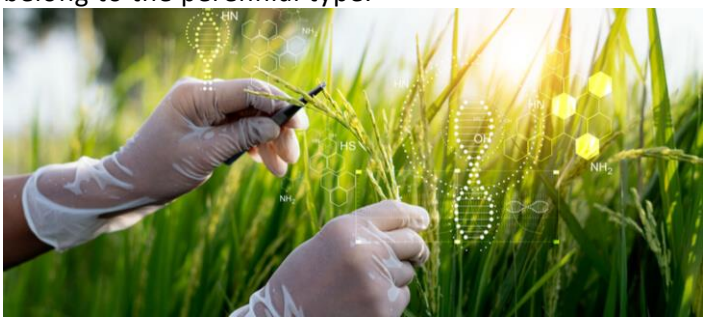
Annual or seasonal plants have a one-year life cycle. Because only dormant seeds can pass from one generation to another, crops of the annual type must be replanted each season. *Tomatoes, radishes, eggplant, peas, beans, squash, lettuce, mustard, sunflowers, and grains* are examples of annual plants.

Biennial Plants

Biennials are flowering plants with a biological life cycle of two years (two growing seasons). During the first year, the plant grows vegetative organs such as leaves, stems, and roots. Then, the plant enters a resting phase and overwinters underground during the cold season. Stem elongation, flower and seed development, and ripening occur during the second growing season, after which the plant dies. Biennial crop type includes *carrots, beets, turnips, onions, cabbage, parsley, and coriander*.

Perennial Plants

Perennials are plants that can live for more than two growing seasons. This type usually grows new herbaceous part from the previously existing root system from season to season. Perennials include trees and shrubs such as *pears, apples, almonds, peaches, walnuts, and hazelnuts*. Some *herbaceous flowering plants* and *ground covers* also belong to the perennial type.



Genetically Modified Organisms

Previously, breeders selected the best specimens to give plants desired characteristics, such as higher productivity or resistance to certain types of diseases. Thanks to genetic engineering, we can obtain such features much more quickly and with greater certainty. As a result, a distinct type of crops emerged: genetically modified organisms (GMOs) — plants that have had their genetic material artificially modified.

Farmers can now purchase GM seeds to grow plants resistant to different types of irritants: diseases, extreme temperatures, chemicals, and others. In this way, farmers can significantly reduce costs and increase crop yields. The variety of applications for different types of genetically engineered crops is astounding:

- nutritional improvement: increased vitamin content and healthier fatty acid profiles;
- stress tolerance: resistance to extreme temperatures, drought, or soil salinization;
- disease resistance: enhanced resistance to various types of plant pathogens, such as bacteria, viruses, and fungi;
- biofuels: improved ethanol conversion through modified plant cell wall composition;
- Phytoremediation: plants' ability to extract pollutants from the soil.

Despite the numerous benefits of GMOs, the spread of genetic modification can drastically reduce biodiversity. Besides that, as GM plants become pesticide resistant, the use of chemicals increases significantly. Therefore, while organic farming is typically more expensive, it has numerous benefits in terms of sustainability.

How To Classify And Manage Different Types Of Crops With

		Satellite Technology When deciding which types of crops to plant, historical data about the region and the needs of each plant must be considered. Later, growers have to use various cultivation and field management practices to maximize yields. Satellite technologies, radar, and multispectral images help farmers with all of these tasks. Using satellite imagery, you can analyze large areas and obtain accurate information about the field's historical and current vegetation. Irrigation Management Water use differs by crop type. When looking at historical yield data, you will notice that some types of plants yield more than others in areas with certain moisture levels. For example, water is essential for successful alfalfa cultivation. The same goes for rice, soybeans, wheat, sugarcane, and cotton. If the climate has dry spells, farmers should consider a precision irrigation system. This system must provide plants with adequate moisture at all stages of their development while consuming minimal resources. Historical weather data from EOSDA Crop Monitoring allows you to see climate trends in a specific field or region, compare precipitation and soil moisture to plant needs, and efficiently prepare your field for the next growing season.	

Name of Teacher: **School:** **District:**