

## **EaD Comprehensive Lesson Plans**



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### **BASIC 9**

### **WEEKLY LESSON PLAN – WEEK 8**

Strand:	Systems		Sub-Strand:	Farming Systems	
Content Standard:	B9.3.4.1 Demonstrate knowledge and skills in the preparation of different types of manure from animal and plant waste				
Indicator (s)	B9.3.4.1.1 List and explain the different plant and animal waste used in preparing different types of manure  B9.3.4.1.2 Demonstrate the preparation of different types of manure  B9.3.4.1.3 Prepare different types of manure.		Performance Indicator Learners can identify the advantages and disadvantages of using manure.		
Week Ending	01-03-2024				
Class	B.S.9	Class Size:		Duration:	
Subject	Science				
Reference	Science Curriculum, Teachers Resource Pack, Learners Resource Pack				
Teaching / Learning Resources	Pictures, Videos, Charts.		Core Competencies:	<ul style="list-style-type: none"><li>Operational skills</li><li>Manipulative skills</li></ul>	
DAY/DATE	PHASE 1 : STARTER	PHASE 2: MAIN			PHASE 3: REFLECTION
TUESDAY	Assist Learners to explain the concept “Manure”.	<div>1. Learners brainstorm to identify 2 types of manure used by farmers.</div> <div>2. Discuss with the Learners about examples of manure.</div> <div>3. Assist Learners to identify the materials used in preparing manure and their source</div> <div>What is Manure?</div> <div>Manure is a decomposed form of dead plants and animals that is applied to the soil to increase productivity. It is a cost-effective and natural fertilizer. Manure can also be made from any living being and animal waste. Nitrogen, phosphate, and potassium are abundant in livestock excrement. Manure contains organic compounds and humus, which boost soil fertility. These are better in the long run and more environmentally friendly. It is a renewable resource. Manure is a good soil improver. When applied to agricultural fields, it acts as a field residue. Farmers can sell their manure to anyone who wants to improve their soil’s fertility. As a result, it may be able to generate income for farmers. They boost the soil’s overall capabilities and long-term viability. The ability of water storage is improved by manure. Raw manure, such as biochar, compost, and other organic materials,</div>			Learners brainstorm to explain how to use different animal and plant manures under different soil and climatic condition.  Exercise;  Explain 3 types of manure.

can help boost the organic content of the soil.



The solid content of various types of manure is roughly 26%. The solids are separated from the liquids, and the solids are used as bedding. Various biofuels can be made from carbon and other components. Manure also has a high fibre content. Fibre is abundant in undigested animal feed, straw, sawdust, and other bedding. Manure is environmentally friendly and increases food production greatly. Feeding an increasing population was incredibly tough. Manure treatment increases crop productivity and improved soil fertility. Different sources of Manure are:

1. Plant waste
2. Weeds, water hyacinth etc.
3. Waste of animals and humans
4. Debris of plants
5. Agricultural By-products

#### **Types of Manure**

Manure can be divided into green manure, farmyard manure, and compost manure. The various forms of manure that farmers use are as follows:

#### **Green Manure**

Using green manure increases the amount of organic matter in the soil. This type of manure has deep roots in the ground. These aid in weed management and the avoidance of soil erosion.

#### **Farmyard Manure**

Farmyard manure improves soil texture and is used as a natural fertiliser. It increases the ability of the soil to retain more water and minerals. It also increases mineral delivery and plant nutrition by increasing soil microbial activity.

#### **Compost Manure**

It improves soil structure as well as water and nutrient retention. As a result, it increases plant health by increasing nutrient value.

#### **How is Manure Prepared?**

Manure is produced when plant or animal wastes

		<p>decompose. Plant and animal wastes are placed in open pits where bacteria can degrade them. Following are the three techniques used to prepare manure:</p> <ul style="list-style-type: none"> <li>• Pot Composting</li> <li>• Vermicomposting</li> <li>• Bokashi Method</li> </ul> <p><b>Example of Manure</b> Some example of Manure are:</p> <ul style="list-style-type: none"> <li>• Peals of Vegetable</li> <li>• Cattle dung</li> <li>• Sheep and Goats dropping</li> <li>• Slaughterhouse waste</li> </ul>	
<b>THURSDAY</b>	Demonstrate on how to prepare manure from different plant and animal wastes.	<ol style="list-style-type: none"> <li>1. Show Learners a video educating them on the process of preparing manure.</li> <li>2. Assist Learners to practice preparing manure from different plant and animal wastes.</li> <li>3. Discuss with the Learners about the steps involved in preparing manure from plant and animal wastes.</li> </ol> <p><b>COMPOSTING MANURE PROCESS</b></p> <p>The microorganisms responsible for composting are indigenous to manures. By properly managing compost, the producer facilitates these decomposing microbes. The manure must be piled, the carbon-to-nitrogen (C/N) ratio should be 30-to-1, 50% of the pore space should contain water and the pile must be aerobic (having oxygen) (Rynk et al., 1992).</p> <p>Manure usually is piled into a windrow. The windrow dimensions are dictated by the length of the pad and size of the turning implement. After a day or two, the pile should reach temperatures in excess of 120 F (Figures 3 and 6).</p> <p>The C/N ratio in a composting pile needs to range from 20-to-1 (20 parts of carbon for every part of nitrogen) to 40-to-1 (40 parts of carbon for every part of nitrogen). Decomposing microorganisms typically have a C/N ratio of 5-to-1 to 10-to-1. The C/N ratio needs to be higher because approximately 50% of the metabolized carbon is released as carbon dioxide (Miller, 1996). Nitrogen can be lost when too much (C/N ratio below 20-to-1) is present, and the pile might smell of volatizing ammonia. Adding carbon (straw, corn stalks or woodchips) can help alleviate this. Too much carbon (C/N ratio more than 40-to-1) in a compost pile can immobilize nitrogen and slows the composting process (Coyne and</p>	<p>Reflect on processes involved in preparing manure.</p> <p><b>Exercise;</b></p> <p>State the steps involved in preparing manure from;</p> <ol style="list-style-type: none"> <li>i. Animal wastes</li> <li>ii. Plant wastes.</li> </ol>

		<p>Thompson, 2006).</p> <p>Composting material's C/N ratio varies greatly. Differences in manure can vary because of differences in species, feeding rations, bedding practices, climate, storage facility, etc. The C/N ratio of bulking materials of plant origin varies greatly as well and for the same reasons as manures. Table 1 outlines C/N ratios that various composting materials possess. Figure 4 and Table 2 illustrate the process of determining the C/N ratio.</p> <p>Water management is important in compost because 40-65% of the pore space in composting materials should have water. Measuring devices can be used to monitor the moisture, but they can be costly.</p> <p>One way to test moisture is the simple hand test called the "wet rag test." Squeeze the compost and feel for moisture. If water drips out, then it is too wet. But if the compost feels like a wrung-out wet rag, the compost has sufficient amounts of moisture (Rynk et al., 1992). Remember to wash your hands after working with compost</p>	
<b>FRIDAY</b>	Learners brainstorm to identify examples of nutrients available in Manure.	<ol style="list-style-type: none"> <li>1. Discuss the importance of the nutrients in manure with the Learners.</li> <li>2. Show Learners a video explaining how to turn manure into composite.</li> <li>3. Assist Learners to identify the factors to consider when applying manure on farm land or garden.</li> <li>4. Learners brainstorm to identify the advantages and disadvantages of manure.</li> </ol> <p><b>Advantages of Manure</b></p> <ul style="list-style-type: none"> <li>• These are a good source of macronutrients.</li> <li>• Improves soil fertility.</li> <li>• Cost-effective</li> <li>• Reduces soil erosion and leaching.</li> <li>• Improves the physical properties of the soil and aerates the soil.</li> <li>• Improves the water and nutrient holding</li> </ul>	<p>Reflect on the importance of applying manure on farm lands and gardens.</p> <p><b>Exercise;</b></p> <p>State 5 importance of applying manure on farm lands.</p>

		<p>capacity of the soil.</p> <ul style="list-style-type: none"> <li>• It can be transported easily.</li> <li>• Methane gas is evolved as the by-product of manure that can be used for cooking and heating purposes.</li> <li>• The crops grown on the land treated with manure produces healthy crops.</li> </ul> <p>Manure is an ideal soil amendment. When it is applied to the agricultural fields it acts as a field residue. Farmers can sell the manure to people who need to improve their soil fertility. Thus, it can bring income to farmers. They add to the overall soil ability and sustainability. Manure increases the water holding capacity of the soil. The organic content of the soil can also be improved by applying raw manure like biochar, compost, etc.</p> <p>Different types of manure contain about 26% solid. The solid and liquid portions are segregated and the solids are used for bedding. The carbon content and other elements can be used to produce different biofuels. Manure also contains a large number of fibres. The undigested animal feed, straw, sawdust, or other bedding contains a lot of fibre.</p> <p>Manure is environment-friendly and has contributed a great deal in increasing food production. It was very difficult to feed a growing population. Use of manure improved the fertility of the soil and increased the yield of the crops.</p>	
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