Strand:	Health and Safety	**Sub-Strand:**	Environmental Health

BASIC 9

WEEKLY LESSON PLAN – WEEK 6

Content Standard:	B9.1.3.2 Demonstrate understanding of clean energy, and Improved Cookstoves (ICS) and their accompanying fuels				
Indicator (s)	B9.1.3.2.1: Explain what is meant by clean energy and improved cookstoves and fuels B9.1.3.2.2: Explain the benefits of improved cookstoves and fuels		**Performance Indicator** Learners can use an improved cookstove.		
Week Ending	18-10-2024				
Class	B.S.9	**Class Size:**		**Duration:**	
Subject	Career Technology				
Reference	Career Technology Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.				
Teaching / Learning Resources	Poster displaying the meaning of "Clean energy", Improved cookstove and fuel, traditional stove, Video showing how to use the improved cookstove and fuel for cooking	**Core Competencies:**	• Communication and Collaboration. • Critical Thinking and Problem Solving. • Creativity and Innovation.		

DAY/DATE	**PHASE 1 : STARTER**	**PHASE 2: MAIN**	**PHASE 3: REFLECTION**
WEDNESDAY	Learners brainstorm to explain "Clean energy".	1. Show Learners pictures and videos on improved cookstoves and fuels, traditional cookstoves and fuels and make comparison on them. 2. Assist learners to identify improved cookstoves and fuels. 3. Discuss with the Learners on what happens when clean energy is used. 4. Learners in small groups to discuss and present to the class on how Clean cooking or clean energy can reduce pollution from burning wood or coal in traditional stoves and protect human health.  What is an Improved Cookstove (ICS)? Cookstoves are commonly called "improved" if they are more efficient, emit less emissions or are safer than the traditional cook stoves or three-stone-fires. The term usually refers to stoves which are burning firewood, charcoal, agriculture residues or dung.[3][4] **Energy efficiency** describes the heat transferred into the pot	Through questions and answers, conclude the lesson. **Exercise;** 1. What is clean Energy? 2. Describe what happens when clean energy is used.

		in relation to the overall energy generated by the stove within a defined task (e.g.Water Boiling Test, WBT). A higher efficiency can i.e. be achieved by:[5][6] ▪ Better combustion of the fuel by providing an insulated combustion chamber around and above the fire, which leads to a better mixing of gases, flame and air. This enhances the temperature of the fire with the following consequences: faster water boiling, fuel use reduction, and decreases in CO and PM. ▪ Maximum transfer of heat of combustion from the flame and the hot gases to the cooking pot. ▪ Minimum loss of heat to the surroundings. **Specific fuel consumption** describes the fuel used per unit of food cooked or boiled water, e.g. how much wood was used to cook a liter of beans.[5] When we talk about the efficiency of stoves, we usually compare the **specific fuel consumption** of a specific stove to either (a) a benchmark or (b) the specific consumption of another stove. Examples: ▪ Stove A consumes less fuel for a specific standardized task as indicated in the benchmark (e.g. 80g of charcoal per kg food prepared in a controlled cooking test) ▪ Stove A consumes 40% less fuel than stove B per litre boiled water (e.g. compared by a 5l Water Boiling Test)	
THURSDAY	Learners brainstorm to identify 5 disadvantages of the traditional cookstove and fuel	1. Discuss with the Learners about the importance of using the improved cookstove and fuel. 2. Assist Learners to identify the precautions to be taken when using the improve cookstove and fuel. 3. Demonstrate how to use an improved cookstove to cook whilst Learners observe. **Health Benefits** The displacement of inefficient, polluting traditional stoves is critical to achieving health benefits. For example, based on the air quality model in the "International Workshop Agreement (IWA): Guidelines for Evaluating Cookstove Performance" (ISO 2012),[27] a 3-stone-fire would have to be used for less than approximately 1 hour per week, and there must be zero emissions from any other source in order to stay below the World Health Organization (WHO) Annual Interim 1 Target for PM 2.5 (particulate matter 2.5 µm in diameter and smaller) in the kitchen. Put simply, for protection of health at WHO levels, users not only must use an extremely clean stove but also must use it almost exclusively. Integrated exposure-response models for PM 2.5 for heart disease, stroke, and respiratory illness provide quantitative support for standards of acceptable indoor air	Learners to practice using improved cookstove. **Exercise;** Explain 5 benefits of using improved cookstove.

		pollution exposures. **Fuel Efficiency** From a fuel efficiency perspective, to achieve a 50% fuel savings, the most efficient cookstoves (Tier 4 for fuel efficiency as defined by the ISO International Workshop on Cookstoves[27]) must displace 70% of typical baseline stove use, or a mid-level stove in terms of efficiency (Tier 2) must be used exclusively.[29] While currently this may appear to be unattainable in many settings, it is important to acknowledge the value of incremental progress in areas of technology, demand creation, and consumer support that is advancing us toward this goal. **Cookstove Use Patterns** The quantification of cookstove use is possible using technologies and time-use pattern survey tools such as Stove Use Monitoring Systems (SUMS); Nexleaf Analytics Wireless Cookstove Sensors (WiCS); the SWEETSense STOVE; and direct survey tools. However, few studies have reported how consumers use cookstoves in parallel and for what tasks. Knowing which cooking tasks are responsible for the greatest emissions and fuel consumption helps stove producers ensure their designs are well-suited for those tasks, and this can inform user training efforts to strategically encourage consumers to use the ICS specifically for those tasks. Understanding the daily patterns of traditional and nontraditional cooking technologies is essential for researchers and policy makers attempting to reduce indoor air pollution and environmental degradation from inefficient cookstoves.	

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