

**THE NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL EDUCATION AND
TRAINING**



OCCUPATIONAL STANDARDS

OCCUPATION: FOOD INSPECTION AND TESTING TECHNICIAN

LEVEL: NTA LEVEL 4

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TABLE OF CONTENTS

ABBREVIATIONS.....	ii
GLOSSARY OF TERMS.....	iii
1.0. INTRODUCTION.....	1
2.0. OCCUPATIONAL STANDARD DEVELOPMENT PROCESS.....	Error! Bookmark not defined.
3.0. THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR FOOD INSPECTION AND TESTING TECHNICIANS	2
4.0. VALIDITY PERIOD.....	3
5.0. OCCUPATIONAL STANDARDS	Error! Bookmark not defined.
5.1 OCCUPATIONAL STANDARDS FOR FOOD INSPECTION AND TESTING TECHNICIAN - NTA 4	4
TABLE 1: DACUM CHARTS FOR FOOD INSPECTION AND TESTING TECHNICIAN - NTA 4.....	34

ABBREVIATIONS

CBET	Competency Based Education and Training
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LIMS	Laboratory Information Management System
NACTVET	National Council for Technical and Vocational Education and Training
NOS	National Occupational Standards
OS	Occupational Standards
OSHA	Occupational Safety and Health Administration
TBS	Tanzania Bureau of Standards
TET	Technical Education and Training
TFDA	Tanzania Food and Drugs Authority
TVET	Technical and Vocational Education and Training

GLOSSARY OF TERMS

Circumstantial Knowledge:	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.
Competence:	The ability to use knowledge, understanding, practical, and thinking skills to perform effectively to the workplace standards required in employment.
Competency:	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
Competency-based Education:	An instructional programme that derives its content from validated tasks and bases assessment on the learner's performance.
Curriculum:	A description or composite of statements about "what is to be learned" by the trainee/student in a particular instructional programme; a product that states the "intended learning outcomes".
Educational/Training Programme:	The complete curriculum and instruction (what and how) that is designed to prepare a person for employment in a job or other particular performance situation.
Occupation:	A specific position requiring the performance of specific tasks – essentially the same tasks are performed by all employees having the same title. (Example: baker)
Occupational Area:	This is a broad grouping of related jobs. (Example: food service)
Occupational Competence:	The application of knowledge and skills that consistently meet the standards required by the work context.
Occupational Standards:	Specific requirements of competences people are expected to demonstrate in a particular occupational area, including knowledge and relevant attitudes. They also act as a performance tool of assessment of the prescribed outcomes.
Occupational/Job Analysis:	A process used to identify the tasks that are important to employees in any given occupation.
Performance Criteria:	Indicate expected end results or outcomes in the form of evaluative statements.
Skills:	The ability to perform occupational tasks with a high degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor.

Standards:	A set of statements, which if proved true under working conditions, means that an individual is meeting an expected level and type of performance.
Task Analysis:	The process of analysing each task to determine the steps, circumstantial knowledge, attitudes, performance standards, tools and materials needed, as well as safety concerns required for the employees performing it.
Task:	A work activity that has a definite beginning and ending, is observable or measurable, and consists of two or more definite steps that leads to a product, service, or decision.
Underpinning Knowledge:	Crucial knowledge that an individual must acquire in order to demonstrate competences that are associated in performing a given task.
Verification Process:	The process of having experts review and confirm the importance of the task (competency) statements identified through occupational analysis. Other questions, such as the degree of task learning difficulty are also frequently asked. This process is also sometimes referred to as validation.

1.0. INTRODUCTION

Technical Education and Training (TET) is one of the most important education sub-sectors in Tanzania, responsible for developing a skilled workforce to support the country's industrialization economic agenda. Tanzania's *Development Vision 2025* intends to raise the country's economy to a middle-income status, with a high level of human development. This requires a skilled workforce that is aligned with the needs of the public and private sectors of the economy. The National Council for Technical and Vocational Education and Training (NACTVET) has begun the job of drafting Occupational Standards (OS) that will eventually be adopted as National Occupational Standards (NOS) for use in the delivery of TET that meets the needs of the labour market and the country's economic agenda.

Occupational Standards (OS) are performance criteria that are matched with labour market demands. Each of them describes the functions, performance standards, and understanding or knowledge underpinning a given occupation. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruitment, supervision, and appraisal, as well as TET Standards. They are also helpful for benchmarking and harmonizing job qualifications on a national and international level. Standards, in general, provide a solid framework for high-quality TET that is labour market-relevant, current, and consistent in application across all public and private institutions.

However, it must be noted that Occupational Standards are different from Training /Education Standards. Occupational standards are defined in terms of activities performed by a person in a selected occupation (e.g., an electrical engineer designs electrical circuits, performs troubleshooting in electrical circuits, etc.), and are usually defined by Employers following procedures as agreed upon by all the stakeholders. On the other hand, Training and Education Standards are developed from the activities defined in the occupational standards, and they specify learning objectives to ensure that the necessary skills and knowledge are developed by a person to enable him/her to function at an agreed level in an occupation. Training and Education Standards are used to define curricula in training institutions. It is critical, however, to establish a direct link between the occupational standards and the training standards for both of them to respond collaboratively to the demands of the labour market.

For the purpose of TET delivery, Tanzania has adopted the Competence Based Education and Training (CBET) approach. The CBET approach focuses on providing learners with the skills and knowledge required to meet the occupational standards. Occupational standards are thus the starting point for developing competency-based training (CBET) programmes. Therefore, it is quite pertinent

for TET institutions to use the relevant occupational standards as a benchmark for formulating their curricula.

Occupational Standards are developed based on a given occupation's current and future demands. As a result, they serve as a means of bridging the gap between the worlds of employment and technical education and training.

The document explains how the occupational standards were developed, as well as the scope, the occupational profile in the form of DACUM charts, and the Occupational Standards.

2.0 OCCUPATIONAL STANDARD DEVELOPMENT PROCESS

The process of developing these Occupational Standards involved both local and international expertise. The process began with an examination of major documents that guide Tanzanian skills development including the *10-year National Skills Development Strategy (2016-2026)*. NACTVET labour market reports were also used in the literature review to determine the skills demand in the Tanzanian labour market as a whole.

After the literature review, a team of experts in consultation with practitioners developed draft occupational standards. The draft document was used to develop an occupational profile for each occupation (DACUM Chart), which is attached as an **Appendix** to every Occupational Standard.

The occupational standards were validated during the stakeholders' forum held on 22nd and 23rd February 2024 at Morogoro. The information from the stakeholders' forum provides insight from the workplace, professional bodies, regulatory bodies and sector ministries regarding trends and changes in the profession, including how well graduates are prepared for working in the occupation.

3.0. THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR FOOD INSPECTION AND TESTING TECHNICIANS

The standards cover a broad range of duties and tasks that can be performed by a Food Inspection and Testing Technician. However, the occupational standards are not meant to replace individual job descriptions. Instead, they are to be used for guidance in defining skill levels and knowledge for the technician in specific settings or positions. The Food Inspection and Testing Technician may perform tasks in a number of key areas of the occupational standards, but not necessarily in all areas. For example, in large operations, other individuals may be employed or designated to perform specific tasks.

The Food Inspection and Testing Technicians work under the supervision of engineers, and shall conduct sample preparation, procurement of reagent supplies, preparation for physical and chemical detection and microbe detection, and safe laboratory practices. Generally, the Food Inspection and Testing Technician performs the following responsibilities:

- a) Sample preparation
- b) Procurement of reagent consumables
- c) Preparation of physical and chemical detection
- d) Preparation of microbe detection
- e) Laboratory safety operation

The Occupational Standards have been clustered into NTA qualification levels, i.e. NTA 4, 5 and 6.

4.0. VALIDITY PERIOD

Due to the rapid development of technology, the validity period of occupational standards is 3-5 years. The review will proceed in the same manner as the one before it, with new occupational standards being developed based on current trends of the labour market.

5.0. OCCUPATIONAL STANDARDS

5.1 OCCUPATIONAL STANDARDS FOR FOOD INSPECTION AND TESTING TECHNICIAN - NTA LEVEL 4

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PREPARE SAMPLES	DUTY NO.	401
TASK TITLE	PREPARE SAMPLES	TASK NO.	4011
PERFORMANCE CRITERIA	The person performing this task must be able to prepare and retain samples in accordance with standards and programs.		
RANGE STATEMENT	The task can be performed in the food testing site under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Manual of sample preparation methods; 2. Labels, marker pens, plastic bags, recorders, etc.; 3. Commonly-used laboratory instruments and equipment, such as balances, homogenizers, pulverizers, centrifuges, thermostat water baths, transition equipment, grinders, beakers, glass rods, measuring cylinders, centrifuge tubes, sample bags, chemical reagents, and so on; 4. Personal protective equipment.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Obtain the materials and tools as required by the task; 2. Select the method of sample preparation; 3. Separate samples; 4. Crush samples; 5. Mix samples; 6. Retain samples; 7. Fill in the sample preparation record; 8. Make specifications for preparation of identification samples; 9. Record the experimental environmental conditions; 10. Use personal protective equipment.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Prepare samples according to the quartering method; 1.2 Prepare samples according to the three-layer and five-point-based method; 1.3 Retain samples in accordance with the sample retention system. 1.4 Dispose samples 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principles of homogeneity, representativeness and typicality of samples; 2.2 Principles of originality and avoidance of contamination of samples; 2.3 Sample retention specifications. 2.4 Sample disposal procedures 3.0 Theories	

	The person performing this task must be able to explain the following: 3.1 Workflow and practices of sample preparation; 3.2 Sample retention methods; 3.3 Quartering method; 3.4 Three-layer and five-point-based method; 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills; 4.3 Skills in marking and recording.
DESCRIPTION OF THE END PRODUCT / SERVICE	Samples are prepared and retained in accordance with sample preparation standard operation procedures and sample retention systems.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Safety operation of equipment; 2. Occupational health and safety; 3. Numerical computation.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PROCURE CHEMICAL REAGENT CONSUMABLES	DUTY NO.	402
TASK TITLE	PROCURE STANDARD SUBSTANCES	TASK NO.	4021
PERFORMANCE CRITERIA	The person performing this task must be able to conduct purchasing and receiving consumables in accordance with procurement management documents and manufacturer's manuals.		
RANGE STATEMENT	The task can be performed under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Computer, recording pen; 2. List of qualified suppliers; 3. Requisitions, contracts, receipts, etc.; 4. Procurement management documents. 5. Specification catalogues 6. Safety gear		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Identify the grade markings of the standard substances; 2. Formulate the procurement plan; 3. Fill out a request form for the procurement of standard substances; 4. Collect, examine and evaluate information on suppliers of standard substances; 5. Select and confirm the qualification of the supplier of standard substances; 6. Confirm the quality, prices and service of the standard substance products; 7. Establish contracts for the procurement of standard substances; 8. Purchase standard substances; 9. Verify quality of purchased reagents 10. Inspect and accept procured standard substances;		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Confirm the grade of the standard substance; 1.2 Confirm the qualification of the supplier of standard substances; 1.3 Select the supplier; 1.4 Evaluate the supplier; 1.5 Perform verification of laboratory supplies 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principle of merit-based procurement of "good quality at a low price"; 2.2 Principle of metrological traceability; 2.3 Regulations on the management of standard substances; 2.4 Regulation of contracts, records, bills, etc. 3.0 Theories The person performing this task must be able to explain the following:	

10. Fill in the inspection and acceptance records; 11. Organize bills; 12. Perform financial reporting.	3.1 Distinction of grade markings for standard substances; 3.2 Procurement procedures for standard substances; 3.3 Development of procurement plans. 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills; 4.3 Negotiation skills; 4.4 Skills in information finding and collection; 4.5 E-commerce skills; 4.6 Computer application skills; 4.7 Management skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Standard substances are procured in accordance with detecting requirements and procurement management documents.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Business knowledge; 2. Occupational health and safety; 3. Numerical computation.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PROCURE CHEMICAL REAGENTS AND CONSUMABLES	DUTY NO.	402
TASK TITLE	PROCURE GENERIC REAGENTS	TASK NO.	4022
PERFORMANCE CRITERIA	The person performing this task must be able to conduct purchasing and receiving inspections in accordance with procurement management documents and manufacturer's manuals.		
RANGE STATEMENT	The task can be performed under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Computer, recording pen; 2. Reagent manual; 3. List of qualified suppliers; 4. Requisitions, contracts, receipts, etc.; 5. Procurement management documents; 6. Specification catalogues; 7. Safety gear.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Prepare procurement schedules for generic reagents; 2. Correctly complete procurement requisitions; 3. Collect, examine and evaluate information on suppliers of generic reagents; 4. Select and verify supplier qualifications; 5. Verify purchased reagents complying in requirements; 6. Establish procurement contracts; 7. Procure generic reagents; 8. Inspect and accept procured generic reagents; 9. Fill in the conservation, inspection and acceptance records; 10. Organize and record bills; 11. Complete payment of goods and financial reporting.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Select the grade and suitability of the reagent; 1.2 Select the supplier of the reagent. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principle of merit-based procurement of "good quality at a low price"; 2.2 The principle of safety; 2.3 The principle of sustainable supply; 2.4 Chemical reagent regulations. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Principle of identifying supplier qualifications; 3.2 Purchasing process for generic reagents. 4.0 Essential Skills 4.1 Communication skills;	

	4.2 Teamwork skills; 4.3 Negotiation skills; 4.4 Skills in information finding and collection; 4.5 E-commerce skills; 4.6 Management skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Generic reagents are requested to be purchased based on the purpose of the experiment and the procurement management document.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Chemical reagents handbook; 2. Laboratory manual; 3. Business knowledge; 4. Numerical computation.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PROCURE CHEMICAL REAGENTS AND CONSUMABLES	DUTY NO.	402
TASK TITLE	PROCURE HAZARDOUS CHEMICALS/MATERIALS	TASK NO.	4023
PERFORMANCE CRITERIA	The person performing this task must be able to request purchases in accordance with the documentation of procedures for managing the procurement of hazardous materials.		
RANGE STATEMENT	The task can be performed in the food testing site under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Documentation of procurement procedures for hazardous chemicals/materials; 2. Documentation of procurement management systems for hazardous chemicals; 3. Computer, recording pen; 4. List of qualified suppliers; 5. Requisitions, contracts, receipts, etc.; 6. Emergency rescue equipment and devices; 7. Personal protective equipment.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Identify hazardous chemical signage; 2. Identify the physical and chemical properties, hazards of hazardous chemicals; 3. Fill out purchase requisitions for hazardous chemicals; 4. Process purchase vouchers and permits for hazardous chemicals; 5. Confirm the qualifications of suppliers of hazardous chemicals; 6. Confirm carrier qualifications; 7. Procure hazardous chemicals; 8. Organize and record bills; 9. Complete payment of goods and financial reporting; 10. Observe occupational health and safety precautions; 11. Use personal protective equipment.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Confirm the signs and rating of hazardous chemicals; 1.2 Confirm the qualifications of suppliers of hazardous chemicals; 1.3 Confirm carrier qualifications. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 The principle of safety; 2.2 Principle of quality and affordability; 2.3 Principle of traceability; 2.4 Principle of license management; 2.5 Hazardous chemical act of administration. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Procurement workflow of hazardous chemicals;	

	3.2 Procedures for the safe use of hazardous chemicals; 3.3 Hazards and protection against hazardous chemicals; 3.4 Classification and signs of commonly-used hazardous chemicals. 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills; 4.3 Negotiation skills; 4.4 Computer application skills; 4.5 Safety protection skills; 4.6 Management skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Hazardous articles are procured in accordance with the hazardous articles management regulations and the procurement management system.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Numerical computation; 3. Business knowledge.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PROCURE CHEMICAL REAGENTS AND CONSUMABLES	DUTY NO.	402
TASK TITLE	PROCURE METERING GLASSWARE	TASK NO.	4024
PERFORMANCE CRITERIA	The person performing this task must be able to request purchases in accordance with the regulation on the use of laboratory glassware and procurement management documents.		
RANGE STATEMENT	The task can be performed in the food testing site under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Regulations for the use of glassware in chemical laboratories; 2. Computer, recording pen; 3. List of qualified suppliers; 4. Requisitions, contracts, receipts, etc.; 5. Procurement management documents.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Confirm the requirements for metering glassware; 2. Fill out procurement requisitions for metering glassware; 3. Gather information about suppliers; 4. Confirm product quality, price and service, and choose the best source; 5. Confirm supplier qualifications; 6. Procure glassware; 7. Inspect and accept procured metering glassware; 8. Dispose substandard metering glassware and concessions; 9. Complete and maintain acceptance records for metering glassware; 10. Organize and record bills and complete payment of goods and financial reporting.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Confirm the requirements for metering glassware; 1.2 Confirm the qualification of suppliers of metering glassware. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principle of merit-based procurement of "good quality at a low price"; 2.2 Metrological tracing requirements; 2.3 Principle of sustainable supply; 2.4 Regulations for metering glassware. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Procurement procedures for metering glassware. 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills; 4.3 Skills in information finding and collection;	

	4.4 E-commerce skills; 4.5 Computer application skills; 4.6 Negotiation skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Procurement effected in accordance with the procurement management system and the regulations on the use of laboratory glassware.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Business knowledge; 3. Stock preparation and inventory management.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PREPARE FOR PHYSICAL AND CHEMICAL TESTING	DUTY NO.	403
TASK TITLE	PREPARE GLASSWARE	TASK NO.	4031
PERFORMANCE CRITERIA	The person performing this task must be able to handle glassware safely in accordance with operating procedures.		
RANGE STATEMENT	The task can be performed in the food testing site under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Glass instruments commonly-used in the laboratory, such as transfer pipets, pipettes, volumetric flasks, measuring cylinders, beakers, conical bottles, etc.;; 2. Register of glassware losses; 3. Personal protective equipment.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Sort and store glassware; 2. Choose the right glassware; 3. Wash glassware; 4. Dry glassware; 5. Preserve glassware with ground mouths; 6. Use glassware in a standardized way; 7. Fill out the glassware loss register; 8. Dispose of glass waste; 9. Observe occupational health and safety precautions.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Select glassware; 1.2 Wash glassware; 1.3 Dry glassware; 1.4 Use glassware in a standardized way. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principle of safety; 2.2 Principle of traceability. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Safety operation procedures in the laboratory; 3.2 Safety operation procedures for glassware; 3.3 Methods of washing glassware; 3.4 Methods of drying glassware. 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills; 4.3 Skills in marking and recording.	

DESCRIPTION OF THE END PRODUCT / SERVICE	Glassware is operated in accordance with standard operating procedures.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Laboratory safety operation; 2. Occupational health and safety.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PREPARE FOR PHYSICAL AND CHEMICAL TESTING	DUTY NO.	403
TASK TITLE	PERFORM SAMPLE WEIGHING	TASK NO.	4032
PERFORMANCE CRITERIA	The person performing this task must be able to weigh samples correctly according to the weighing requirements.		
RANGE STATEMENT	The task can be performed in the food testing site under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Electronic balances; 2. Tray balance; 3. Commonly-used laboratory tools, such as weighing paper, label paper, calculators, pens, medicine spoons, weighing bottles, filter paper, beakers, desiccators, brushes, and common reagents used in experiments; 4. Weighing record; 5. Instrument using records; 6. Personal protective equipment.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Observe occupational health and safety precautions; 2. Select weighing methods and equipment; 3. Determine the weighing range; 4. Weigh the sample with a tray balance; 5. Weigh the sample with an electronic balance; 6. Record weighing data; 7. Fill in the instrument using records. 8. Store weighing equipment 9. Clean weighing instruments and workplace.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Select weighing methods and equipment; 1.2 Determine the weighing range; 1.3 Weigh the sample with a tray balance properly; 1.4 Weigh samples with an electronic balance. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 principle of weighing on a tray balance; 2.2 Principle of operation and specifications for the use of electronic balances; 2.3 Principle of traceability of weighing data. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Operation and maintenance regulations for balances; 3.2 Sample management procedures. 4.0 Essential Skills	

	4.1 Communication skills; 4.2 Teamwork skills; 4.3 Data-logging skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Samples are weighed according to approved methods and regulations.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Numerical computation.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PREPARE FOR PHYSICAL AND CHEMICAL TESTING	DUTY NO.	403
TASK TITLE	PREPARE SIMPLE SOLUTIONS	TASK NO.	4033
PERFORMANCE CRITERIA	The person performing this task must be able to prepare simple solution in accordance with standard operation procedures.		
RANGE STATEMENT	The task can be performed in the food testing site under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Standard operation procedures for solution preparation; 2. Balance; 3. Calculator, pens, label paper; 4. Measuring cylinder, transfer pipet, beaker, glass rod and reagent bottle; 5. Commonly-used reagents; 6. Reagent receipt records, return records, preparation records, etc.;; 7. Personal protective equipment.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Observe occupational health and safety precautions; 2. Obtain the materials and tools as required by the task; 3. Estimate the amount of reagent needed to prepare the solution; 4. Fill out reagent requests and returns; 5. Select measuring instruments and containers; 6. Weigh solid reagents or measure liquid reagents; 7. Dissolve solid reagents; 8. Dilute and condense to obtain a solution of the desired concentration; 9. Preserve solution; 10. Fill in the solution label information; 11. Fill out reagent preparation records; 12. Store reagents ia safe place 12. Clean and organize the workplace.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Calculate the amount of reagent needed to prepare the solution; 1.2 Select a measuring instrument and weigh the reagents; 1.3 Dissolve and titrate the solution; 1.4 Fill out and keep records. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Basic principles of solution preparation; 2.2 Principles of record completion; 2.3 Laboratory reagent standards. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Specifications of laboratory water; 3.2 Test method. 4.0 Essential Skills	

	4.1 Communication skills; 4.2 Teamwork skills; 4.3 Skills in the use of standard operation procedures; 4.4 Skills in marking and recording.
DESCRIPTION OF THE END PRODUCT / SERVICE	Simple solutions are prepared according to the standard operation procedures of solution preparation.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Numerical computation.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PREPARE FOR MICROBE TESTING	DUTY NO.	404
TASK TITLE	PERFORM CLEANING, STERILIZING AND WRAPPING OF GLASSWARE	TASK NO.	4041
PERFORMANCE CRITERIA	The person performing this task must be able to clean, sterilize and wrap glassware in accordance with the glassware cleaning requirements and standard operation procedures of sterilization and dressing to prepare for microbe detection.		
RANGE STATEMENT	The task can be performed in the microbe detection laboratory under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Autoclave; 2. Electric dry oven; 3. Straws, petri dishes, conical bottles, test tubes, measuring cylinders and other glassware; 4. Scissors and tweezers; 5. String, skimmed cotton, kraft paper or newspaper; 6. Alcohol burners or lighters; 7. Instrument using records; 8. Work clothes and log pens.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Observe occupational health and safety precautions; 2. Wash glassware; 3. Wrap glassware; 4. Check and adjust the liquid level in the autoclave; 5. Carry out moist heat sterilization of glassware through high-pressure steam; 6. Set the parameters of the electric dry oven; 7. Sterilize glassware by dry heat; 8. Autoclave and wash biohazard glassware; 9. Record the use of instruments and equipment; 10. Store glassware in a safe place 11. Clean equipment and workplaces.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Wrap glassware; 1.2 Sterilize glassware by moist heat; 1.3 Sterilize glassware by dry heat. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principles of autoclaving; 2.2 Principles of dry heat sterilization. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Wrapping and sterilization procedures for glassware; 3.2 Procedures for the safety operation of glassware; 3.3 Procedures for the safety operation of the autoclave; 3.4 Procedures for the safety operation of the electric dry oven;	

	4.0 Essential Skills 4.1 Communication skills 4.2 Teamwork skills; 4.3 Clean labor skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Glassware is cleaned, sterilized and wrapped in accordance with standard operation procedures.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Safety operation procedures in the laboratory.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PREPARE FOR MICROBE TESTING	DUTY NO.	404
TASK TITLE	PREPARE COMMONLY-USED REAGENTS FOR MICROBIOLOGICAL INSPECTION	TASK NO.	4042
PERFORMANCE CRITERIA	The person performing this task must be able to prepare commonly-used reagents for microbiological inspections properly in accordance with standard operation procedures.		
RANGE STATEMENT	The task can be performed in the microbe detection laboratory under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Standard operation procedures; 2. Balance; 3. Glassware, such as measuring cylinders, pipettes, transfer pipets, funnels, beakers, dropping bottles, and glass rods; 4. Electric furnace; 5. Dispensing racks; 6. Medicine spoon and weighing paper; 7. Containers such as reagent bottles; 8. Reagent receipt records, return records, and preparation records; 9. Work clothes and log pens.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Observe occupational health and safety precautions; 2. Select a balance with the appropriate sensibility; 3. Select the pipetting gauges or instruments; 4. Select containers such as reagent bottles; 5. Identify and select reagents; 6. Estimate the reagent dosage; 7. Weigh reagents correctly; 8. Prepare and maintain reagents commonly used in microbiological inspection; 9. Store equipment and reagents in a safe place 10. Clean equipment and workplaces.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Prepare reagents of a certain mass and concentration; 1.2 Prepare reagents with a certain volume fraction. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principle of "preparation on demand" of reagents; 2.2 Principle of "use-as-you-go" reagents; 2.3 Principle of "first prepared, first used" for reagents; 3.0 Theories The person performing this task must be able to explain the following:	

	3.1 Methods of preparation and preservation of reagents commonly used in microbiological inspections; 3.2 Precautions for preparation of reagents commonly used in microbiological inspections; 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills; 4.3 Skills in marking and recording.
DESCRIPTION OF THE END PRODUCT / SERVICE	Commonly-used reagents for microbe detection are prepared in accordance with standard operation procedures.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Safety operation procedures in the laboratory.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PREPARE FOR MICROBE TESTING	DUTY NO.	404
TASK TITLE	PREPARE CULTURE MEDIUM AND STERILIZE ITEMS	TASK NO.	4043
PERFORMANCE CRITERIA	The person performing this task must be able to prepare a culture medium properly and sterilize items in accordance with standard operation procedures.		
RANGE STATEMENT	The task can be performed in the microbe detection laboratory under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Glassware such as measuring cylinders, pipettes, conical bottles, test tubes, funnels, beakers, and glass rods; 2. Autoclave; 3. Electric furnace; 4. Graduated enamel cylinder; 5. Dispensing racks; 6. Balance; 7. pH meter or precision pH paper; 8. Medicine spoon and weighing paper; 9. Scissors and tweezers; 10. String, skimmed cotton, gauze, kraft paper or newspaper; 11. Alcohol burners; 12. Reagent receipt records, return records, and culture medium records; 13. Work clothes and log pens.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Observe occupational health and safety precautions; 2. Estimate the amount of culture medium to be used; 3. Fill out reagent requests and returns; 4. Weigh the culture medium; 5. Heat the agar to melting point; 6. Filter the culture medium through gauze; 7. Prepare the culture medium; 8. Adjust the pH of the culture medium; 9. Dispense the culture medium; 10. Sterilize the culture medium;		Detailed knowledge about: 2.3 Methods The person performing this task must be able to explain how to: 1.1 Prepare the culture medium; 1.2 Sterilize the culture medium and items with high-pressure steam; 1.3 Check the culture medium and items for sterility. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principles of autoclaving; 2.2 Preparation principle of culture medium; 2.3 Safety operation specification for sterilizers, electric furnaces, acid and alkaline reagents.	

11. Record culture medium preparation and labeling; 12. Confirm the sterilization of the culture medium and items; 13. Clean equipment and workplaces. 14. Store equipment and reagents in a safe place	3.0 Theories The person performing this task must be able to explain the following: 3.1 Preparation and sterilization of culture medium; 3.2 Methods for checking the sterility of culture medium. 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills; 4.3 Skills in marking and recording.
DESCRIPTION OF THE END PRODUCT / SERVICE	Preparation of culture medium and sterilization of items are implemented in accordance with standard operation procedures.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Safety operation procedures in the laboratory.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PRACTICE LABORATORY SAFETY	DUTY NO.	405
TASK TITLE	SELECT AND USE PERSONAL PROTECTIVE EQUIPMENT	TASK NO.	4051
PERFORMANCE CRITERIA	The person performing this task must be able to select and use appropriate personal protective equipment properly in accordance with personal protection guidelines.		
RANGE STATEMENT	The task can be performed in the food testing laboratory under the supervision of senior food inspection and testing technicians or engineers. The tools and equipment to be used include: 1. Goggles; 2. Masks or face shields; 3. Gloves; 4. Hair cap; 5. Shoe covers; 6. Safety shoes; 7. Guidelines for personal protection; 8. Protective suits or safety clothes.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Observe occupational health and safety precautions; 2. Segregate lab gowns and personal belongings; 3. Select personal protective equipment; 4. Change and wear personal protective equipment; 5. Use personal protective equipment.		Detailed knowledge about: 4.2 Methods The person performing this task must be able to explain how to: 1.1 Circumvent damage from UV sterilizing lamps; 1.2 Avoid microbial contamination. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principles of prevention of laboratory safety risks; 2.2 Using principle of personal protective equipment. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Procedures for donning and doffing laboratory personal protective equipment; 3.2 Laboratory requirements for the placement of personal protective equipment and personal belongings; 3.3 Analysis of laboratory safety risks. 4.0 Essential Skills	

	4.1 Communication skills; 4.2 Teamwork skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Appropriate personal protective equipment is selected and used according to personal protection requirements.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational safety and health; 2. Standards and certification requirements for appliances; 3. Regulations on disposal of appliances.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PRACTICE LABORATORY SAFETY	DUTY NO.	405
TASK TITLE	OPERATE SAFETY FACILITIES AND FIRE-FIGHTING EQUIPMENT	TASK NO.	4052
PERFORMANCE CRITERIA	The person performing this task must be able to operate safety facilities and fire-fighting equipment.		
RANGE STATEMENT	The task can be performed in the food testing laboratory under the supervision of senior food inspection and testing technicians or engineers. The tools and equipment to be used include: 1. Eye washer; 2. Emergency sprinkler; 3. Gas mask; 4. First Aid kit; 5. Fire extinguisher; 6. Fire-extinguishing sand; 7. Fire blanket; 8. Hydrant; 9. Safety operation procedures.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Observe occupational health and safety precautions; 2. Use the eye washer; 3. Operate emergency sprinklers; 4. Use gas masks; 5. Use First Aid kit; 6. Operate fire extinguisher; 7. Use the fire-extinguishing sand; 8. Use the fire blanket; 9. Operate hydrants; 10. Manage fire-fighting equipment.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Use safety equipment in a standardized manner; 1.2 Select and use fire suppression equipment properly. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principles of operation and use of safety protection facilities; 2.2 Positioning, timing and personnel principles of fire-fighting equipment management 2.3 Operating procedures of safety protection facilities and fire-fighting equipment of laboratories. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Emergency response procedures for laboratories; 3.2 Analysis of laboratory safety risks;	

	3.3 Identification of signs for hazardous articles and fire protection. 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills; 4.3 Identification of safety hazards.
DESCRIPTION OF THE END PRODUCT / SERVICE	Safety facilities and fire-fighting equipment are operated in accordance with standard operation procedures.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Processes for relevant training and exercises; 3. Escape and evacuation routes from the workplace.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PRACTICE LABORATORY SAFETY	DUTY NO.	405
TASK TITLE	PERFORM WASTE AND RESIDUE TREATMENT	TASK NO.	4053
PERFORMANCE CRITERIA	The person performing this task must be able to collect and dispose of waste solutions and residues according to the laboratory waste disposal process.		
RANGE STATEMENT	The task can be performed in the food testing laboratory under the supervision of senior food inspection and testing technicians or engineers. The tools and equipment to be used include: 1. Waste containers; 2. Waste solution tanks; 3. Waste bags; 4. Marker pens; 5. Work clothes.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Clean up laboratory waste; 2. Classify and collect waste solutions and residues; 3. Recycle specific wastes; 4. Classify and dispose waste solutions and residues; 5. Identify waste solutions and residues; 6. Dispose waste solutions and residues; 7. Clean the tools, equipment and workplaces.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Classify and dispose of waste solutions and residues in laboratories; 1.2 Collect and store laboratory waste in sub-zones. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Principles of sorting and disposal of laboratory waste solutions; 2.2 Principles of disposal of laboratory waste solutions and residues; 2.3 Criteria for the classification of laboratory waste solutions. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Hazards and disposal protocols for different types of waste. 4.0 Essential Skills 4.1 Communication skills; 4.2 Teamwork skills.	

DESCRIPTION OF THE END PRODUCT / SERVICE	Waste solutions and residues are disposed of according to the laboratory waste disposal process.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Environmental protection technology.

OCCUPATION	FOOD INSPECTION AND TESTING TECHNICIAN	OCCUPATION CODE	
DUTY TITLE	PRACTICE LABORATORY SAFETY	DUTY NO.	405
TASK TITLE	CARRY OUT BASIC LABORATORY SAFETY DRILLS	TASK NO.	4054
PERFORMANCE CRITERIA	The person performing this task must be able to perform safety drills in compliance with the laboratory safety code of practice.		
RANGE STATEMENT	The task can be performed in the food testing site under the supervision of senior technicians or food inspection and testing engineers. The tools and equipment to be used include: 1. Electricity facilities; 2. Water facilities; 3. Sterilization facilities; 4. Switches for water, electricity and gas; 5. Transferring window; 6. Work clothes.		
EVIDENCE REQUIREMENT			
PRACTICAL PERFORMANCE		UNDERPINNING KNOWLEDGE	
The person performing this task must be able to do the following: 1. Observe occupational health and safety precautions; 2. Comply with laboratory regulations; 3. Check for laboratory fire hazards; 4. Check the electrical safety of leakage protectors, cords, sockets, plugs, and high-power electrical equipment in the laboratory; 5. Check water safety in the laboratory; 6. Implement laboratory sterilization; 7. Turn off water, electricity, and gas switches when leaving the laboratory; 8. Evacuate from the laboratory in an emergency; 9. Clean the tools, equipment and workplaces.		Detailed knowledge about: 1.0 Methods The person performing this task must be able to explain how to: 1.1 Ensure the safety of water, electricity, gases, etc. in the laboratory; 1.2 Ensure biosafety in biology laboratory. 2.0 Principles The person performing this task must be able to explain the following principles: 2.1 Laboratory safety code; 2.2 Precautionary principle of laboratory safety. 3.0 Theories The person performing this task must be able to explain the following: 3.1 Class of biosafety protection for microbiology laboratories; 3.2 Safe practices for laboratory electrical facilities; 3.3 Safe practices for sterilizing facilities in microbiology laboratories; 3.4 Laboratory safety risk analysis and identification of hazard sources. 4.0 Essential Skills 4.1 Communication skills;	

	4.2 Teamwork skills; 4.3 Fast learning skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Laboratory safety drills performed in accordance with the laboratory safety code.
CIRCUMSTANTIAL KNOWLEDGE	Detailed knowledge about: 1. Occupational health and safety; 2. Establishment of a laboratory safety management system; 3. Laboratory escape and evacuation routes.

**APPENDIX 1: DACUM CHART FOR FOOD INSPECTION AND TESTING
TECHNICIAN - NTA LEVEL 4**

DUTIES	TASKS	ENABLERS
1.0 Prepare samples	1.1 Prepare samples.	General skills and knowledge • Communication skills • Teamwork skills • Skills in marking and recording • Numerical computation skills Tools and equipment • Internet-connected computer • Personal protective equipment • Sample preparation manual • Commonly-used instruments and equipment for sample preparation Materials • Paper, pens and other office supplies • Label paper, marker pens, sample bags, etc. • Requirements for employees • Teamwork spirit • Conscientiousness • Time management • Meticulousness • Adherence to norms
	2.0 Prepare chemical reagents and consumables	General skills and knowledge • Communication skills • Teamwork skills • Computer application skills • E-commerce skills • Skills in information finding and collection • Fast learning skills • Negotiation skills • Management skills • Numerical computation skills Tools and equipment • Computers and printers connected to the Internet • Personal protective equipment
	2.1 Procure standard substances.	
	2.2 Procure generic reagents.	
	2.3 Procure hazardous chemicals/materials.	
	2.4 Procure metering glassware.	

DUTIES	TASKS	ENABLERS
		• Procurement management documents. • List of qualified suppliers • Reagent manual • Contracts • Documentation of procurement procedures for hazardous chemicals • Documentation of procurement management systems for hazardous chemicals Materials • Paper, pens and other office supplies Requirements for employees • Teamwork spirit • Good faith • Conscientiousness • Time management • Adherence to norms • Safety consciousness
3.0 Prepare for physical and chemical detection	3.1 Prepare glassware.	General skills and knowledge • Communication skills • Teamwork skills • Skills in the use of standard operation procedures • Computer application skills • Skills in marking and recording • Arithmetic skills Tools and equipment • Computers and printers connected to the Internet • Personal protective equipment • Weighing equipment such as balances and measuring cylinders • Glassware such as volumetric flasks Materials • Standard operation procedures • Chemical reagents handbook • Commonly-used laboratory reagents
	3.2 Perform sample weighing.	
	3.3 Prepare simple solutions.	

DUTIES	TASKS	ENABLERS
		- Paper, pens and data- record tables - User's manual of equipment Requirements for employees - Teamwork spirit - Conscientiousness - Time management - Meticulousness - Adherence to norms
4.0 Prepare for microbe detection	4.1 Prepare cleaning, sterilizing and wrapping of glassware.	General skills and knowledge - Communication skills - Teamwork skills - Clean labor skills - Computer application skills - Skills in marking and recording - Arithmetic skills Tools and equipment - Personal protective equipment - Weighing equipment such as balances and measuring cylinders - Glassware such as volumetric flasks - Autoclave - Electric furnace - Standard operation procedures - Documentation of standards or requirements - User's manual of equipment Materials - Commonly-used laboratory reagents - Computer, recording paper and pens Requirements for employees - Teamwork spirit - Conscientiousness - Time management - Meticulousness - Passion for labor
	4.2 Prepare commonly-used reagents for microbiological inspection.	
	4.3 Prepare culture medium and sterilize items.	
5.0 Practice laboratory safety	5.1 Select and use personal protective equipment.	General skills and knowledge

DUTIES	TASKS	ENABLERS
	5.2 Operate safety facilities and fire-fighting equipment.	• Communication skills • Teamwork skills • Identification of safety hazards
	5.3 Perform waste and residue treatment.	• Fast learning skills
	5.4 Carry out basic laboratory safety drills.	Tools and equipment • Personal protective equipment such as goggles and work shoes • Personal first aid facilities such as eyewash, emergency sprinklers, gas masks, and small medical kits • Fire extinguishers, fire-extinguishing sand, fire blankets, fire hydrants and other fire fighting facilities • Water, electricity and sterilization facilities • Safety operation procedures Materials • Guidelines for personal protection • Protective materials such as masks or face shields, gloves, hair hats and shoe covers • Trash cans, waste solution barrels and trash bags Requirements for employees • Teamwork spirit • Conscientiousness • Safety consciousness • Composure