APPLY GENETICS PRINCIPLES

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UNIT DESCRIPTION

This unit describes the competencies required by an applied biology technician to apply genetics principles. It involves applying cell division concepts, applying knowledge on structure of nucleic acids, applying Mendelian law of inheritance, applying protein synthesis knowledge and carrying out animal and plant breeding.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace functions	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements ***(Bold and italicized terms are elaborated in the range)***
1.Apply Cell division concepts	1.1 Experiments on phenotypic variations are carried out as per Mendelian laws of inheritance 1.2 Experiments on mitosis are performed as per cytogenetic procedures 1.3 Experiments on meiosis are performed as per cytogenetic procedures
2. Apply knowledge on Structure of nucleic acids	2.1 Chromosome structure concept is applied as per cytogenetic procedures 2.2 DNA structure and function concepts are applied as per molecular biology techniques 2.3 RNA structure and function concepts are applied as per molecular biology techniques 2.4 Mutation concepts is applied as per genetic principles .

3. Apply Mendelian law of inheritance	3.1 Genetic Inheritance concepts is applied as per Mendel's law of inheritance 3.2 Allele Dominance concepts are applied as per Mendel's Law of Inheritance 3.3 ***Inheritance disorders and diseases*** are identified as per genetic principles
4. Apply Protein synthesis knowledge	4.1 DNA replication principles are applied as per genetic principles 4.2 DNA transcription principles are applied as per genetic principles 4.3 DNA translation principles are applied as per genetic principles
5.Carry out Animal and plant breeding	5.1 Animal and plant breeding materials are assembled as per work requirement 5.2 Animals and plants are bred as per work requirements 5.3 Animal and plant breeding results are reported as per Good Laboratory Practice

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	**Range**
1. Inheritance disorders and diseases include but not limited to:	• Sickle cell anaemia • Albinism • Down's syndrome • Klinefelter's syndrome • Turner's Syndrome • Erythroblastis foetalis

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

- Scientific report writing
- Occupational safety and health
- Basic mathematics
- Computer application
- Microscopy
- Taxonomy
- Animal Anatomy and physiology

Required skills

The individual needs to demonstrate the following skills:

- Problem solving
- Digital literacy
- Communication
- Critical thinking
- Interpersonal
- First aid
- Photography
- Report writing

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Performed experiments on mitosis as per cytogenetic procedures 1.2 Performed experiments on meiosis as per cytogenetic procedures 1.3 Applied DNA structure and function concepts as per molecular biology techniques

	1.4 Applied RNA structure and function concepts as per molecular biology techniques 1.5 Applied Genetic Inheritance concepts as per Mendel's law of inheritance 1.6 Applied DNA replication principles as per genetic principles 1.7 Applied DNA transcription principles as per genetic principles 1.8 Applied DNA translation principles as per genetic principles 1.9 Bred animals and plants as per work requirements
2. Resource implications	The following resources should be provided: 2.1 Appropriately simulated environment where assessment can take place 2.2 Access to relevant work environment 2.3 Resources relevant to the proposed activities or tasks
3 Methods of assessment	Competency in this unit may be assessed through: 3.1 Practical assessment 3.2 Projects 3.3 Oral assessment 3.4 Portfolio of evidence 3.5 Third party report 3.6 Written tests
4 Context of assessment	Competency may be assessed in a: Workplace or simulated workplace

5 Guidance information for assessment	Holistic assessment with other units relevant to the industry sector and workplace job role is recommended.