

## Carry out complex scientific or technical testing operations

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### Overview

This standard covers the competences you need to carry out complex scientific or technical testing operations in a science related work activity, in accordance with approved procedures and practices.

You will be required to demonstrate that you can prepare and carry out the required scientific or technical tests in accordance with the relevant workplace procedures.

The activity is likely to be undertaken by someone in a science related work setting, including individuals working in hospitals, scientific laboratories, schools and universities.

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### Performance criteria

- You must be able to:*
- P1 ensure that your work is carried out in accordance with workplace procedures
  - P2 use safe practices and the appropriate personal protection equipment (PPE) when performing scientific or technical activities
  - P3 identify conditions for the complex scientific or technical tests to be done
  - P4 establish the requirements for the tests to be done
  - P5 identify hazards and assess risks against testing requirements
  - P6 select the appropriate testing methods from procedures for the testing requirements
  - P7 prepare the resources needed for the testing operations
  - P8 prepare the test samples in accordance with the procedures and check their integrity
  - P9 carry out the required tests in accordance with the procedures
  - P10 communicate the required information about the work done, in accordance with departmental and organisational procedures

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### Knowledge and understanding

- You need to know and understand:*
- K1 the health and safety requirements of the area in which you are carrying out the scientific or technical activities
  - K2 the implications of not taking account of legislation, regulations, standards and guidelines when conducting scientific or technical activities
  - K3 the scientific or technical techniques and processes you must use correctly in the workplace
  - K4 the importance of wearing protective clothing, gloves and eye protection for scientific or technical activities
  - K5 the importance of correct identification, and any unique workplace coding system
  - K6 the organisational requirements for maintaining the security of the workplace
  - K7 the lines of communication and responsibilities in your department, and their links with the rest of the organisation
  - K8 the limits of your own authority and to whom you should report if you have problems that you cannot resolve
  - K9 why it is important to follow safe operating procedures when using equipment and/or materials
  - K10 the principles and procedures for the scientific or technical testing
  - K11 the purposes of testing, and the specific use to which the test results are to be put
  - K12 the hazards/difficulties associated with complex testing
  - K13 the relevant testing methods that can be used to achieve the purpose of testing
  - K14 why calibration is important and how to check calibration
  - K15 how to check the sample identity and its integrity
  - K16 the range of methods used to prepare samples
  - K17 how to identify defective equipment and the appropriate action to take
  - K18 the methods that can be used for controlling test variables
  - K19 the concepts of repeatability and reproducibility
  - K20 the range of equipment available for testing, and how to choose the most appropriate equipment
  - K21 the potential impact of the test on health, safety and the environment
  - K22 the methods that can be used for dealing with the handling, storage and disposal of materials
  - K23 the cleaning materials and the methods for their use
  - K24 the methods of safe storage that can be used
  - K25 the document control and reporting procedures that should be used
  - K26 the reasons why effective communication is important, and the methods used for communicating effectively

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**Scope/range**

1. carry out testing operations that have two of the following complex components:
  - 1.1 multi stage testing operations
  - 1.2 very cold/hot test temperatures involved
  - 1.3 multitasking testing
  - 1.4 noisy/vibrating/turbulent elements involved
  - 1.5 multi-parameter or control factors
  - 1.6 involves substances hazardous to health
  - 1.7 environmentally sensitive outcomes
  - 1.8 high level of skill/experience needed
  - 1.9 spontaneity/suddenness of test event
  - 1.10 complex sample components
  
2. identify conditions for the test that include two of the following:
  - 2.1 test environment
  - 2.2 safety factors
  - 2.3 cleanliness
  - 2.4 test criteria
  - 2.5 time recording system
  - 2.6 external influence/factors
  
3. prepare all of the following resources for the testing operations:
  - 3.1 consumables
  - 3.2 utilities/facilities
  - 3.3 test instruments
  - 3.4 test materials
  - 3.5 equipment
  
4. carry out two of the following pre-test check on equipment and test instruments:
  - 4.1 calibration
  - 4.2 serviceability
  - 4.3 cleanliness
  - 4.4 setup conditions
  
5. check three of the following test sample integrity factors:
  - 5.1 free from defects
  - 5.2 arrangement of like parts
  - 5.3 damage and decomposition
  - 5.4 common elements or characteristics
  
6. record and communicate details of work done, to the appropriate people, using:
  - 6.1 verbal report plus one method from the following:
  - 6.2 written or typed report

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- 6.3 computer-based record
- 6.4 specific workplace documentation
- 6.5 electronic mail

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<b>Developed by</b>	Cogent
<b>Version Number</b>	2
<b>Date Approved</b>	February 2017
<b>Indicative Review Date</b>	February 2019
<b>Validity</b>	Current
<b>Status</b>	Original
<b>Originating Organisation</b>	SEMTA
<b>Original URN</b>	O45NLATA3-07
<b>Relevant Occupations</b>	Professional Occupations; Science Professionals; Science and mathematics Science; Science
<b>Suite</b>	LABORATORY AND ASSOCIATED TECHNICAL ACTIVITIES SUITE 3 2010
<b>Keywords</b>	laboratory, technical, LATA, complex, scientific, testing, operations, multitasking, calibration, serviceability