UNIT TITLE:	**Independent Academic Study (Science)**
LEVEL:	**Three**
CREDIT VALUE:	**6**
UNIT CODE:	**WJC839**
UNIT TYPE:	**Graded (Academic subject content)**
GRADE DESCRIPTORS:	**1, 2, 3, 4, 5, 6, 7**

(Access/A2)

This unit has 7 learning outcomes.

LEARNING OUTCOMES	**ASSESSMENT CRITERIA**
The learner will:	**The learner can:**
1. Be able to identify and define a scientific project or research topic.	1.1 Identify and justify a research topic with reference to previous or related work. 1.2 Produce a clearly defined research aim or testable hypothesis related to the chosen issue.
2. Be able to plan and design a research project.	2.1 Plan each stage of the study to include all relevant tasks contextually appropriate to the research task chosen. These should include the identification and evaluation of: (a) a detailed research proposal, (b) a literature review or annotated bibliography, (c) a statement of methodology, (d) a realistic timetable for completion, 2.2 Explain and justify the planned research with reference to, accuracy and reliability and if appropriate ethical guidelines. 2.3 Link research undertaken to relevant prior theoretical and / or practical work undertaken. 2.4 Identify and evaluate any potential barriers or risks to successful execution of the plan within the planning process. 2.5 Carry out and record a risk assessment of the work.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	**The learner can:**
3. Be able to carry out and refine research.	3.1 Use planned and stated techniques to obtain information/results/data explaining outcomes in relation to: (a) precision and accuracy. (b) reliability. (c) validity 3.2 Make modifications to plan as appropriate. 3.3 Record raw data/information appropriately for future processing. 3.4 Identify and record errors in sources, equipment or method.
4. Be able to interpret and organise information in response to a piece of study within a scientific topic.	4.1 Deploy accurate, detailed and relevant knowledge of the subject. 4.2 Use this knowledge in support of a coherent analysis of the study, using appropriate diagrammatic, tabular, graphical or statistical techniques.
5. Be able to consider evidence and reach conclusions.	5.1 Draw relevant conclusions from processed results, with reference to the original hypothesis or aim. 5.2 Use scientific knowledge to explain and clarify the conclusions.
6. Be able to evaluate the investigative process and findings.	6.1 Evaluate the study, discussing strengths and weaknesses within the study, considering both the validity of the research design and procedures and the reliability of the evidence. 6.2 Suggest and justify improvements and modifications to the study.
7. Be able to use academic conventions related to studying a scientific topic.	7.1.Consistently apply relevant academic conventions including: a) accurate and consistent referencing b) appropriate academic written style and 'voice'.

Additional Information / Guidance
This is an Access academic subject unit which is graded and therefore contributes to the 45 graded credits within an Access to HE Diploma. The assessment of this unit is primarily focussed on the academic subject material and not on any generic study skills required in order to carry out the piece of work. The final piece of work is required to be structured in a format that is relevant and appropriate to the task with accurate use of referencing and acknowledgement of sources. Individual centres may require the use of a specific referencing system or they may use their own simpler versions to prepare students for study at degree level. LASER does not wish to impose any requirements on the types of referencing to be used other than to state that students should be properly prepared to understand and apply referencing skills at degree level.

For the avoidance of doubt 'scientific project' as referred to in the Learning Outcomes is taken to represent <u>any</u> appropriate topic of investigation at Level 3 across the scope of Biology, Chemistry or Physics or any sub-discipline thereof (e.g. Bio-Chemistry).

The 'length' or size of the study is difficult to prescribe as the notional learning hours for different types of academic study tasks may vary considerably. Many Access programmes of study will typically set limits of 1500-2000 words for a standard course essay generating 3 credits, with 3000-4000 plus for extended essays and even more for 'mini-dissertations' style assessments. LASER does not therefore place a specified word limit on the study. However, in planning assessment tasks it should be remembered that assessment of a three credit unit should represent 30 hours of study; six credits should equate to 60 hours of study and nine credits should equate to 90 hours of study (including both classroom based teaching and independent study. Any planned assessment should be based therefore on the learning achievable in terms of both knowledge and skills within this time framework.

When identifying the piece of work that will be used as the actual 'academic study', consideration should be given to other outputs by the student (e.g. preparatory notes, research activity, plans and check lists etc.) that could be used as part of the overall assessment. For example a research based study project is likely to include a considerable volume of activity beyond the production of the final written output though it is to be expected that learners produce a clearly and logically structured research Report / Mini-Dissertation / Extended Essay using correct scientific convention throughout. The Assessment Criteria for the unit therefore suggest that these informal preparative activities be formalised to include a clear **Research Proposal; Literature Review / Annotated Bibliography;** statement of **Methodology** and identification of a research **timetable.** These may well be adapted to the specifics of the research undertaken and the context of the academic discipline related to the task, however, they present a formal indication of the intellectual steps which should be evidenced in terms of the development of skills and knowledge to meet the Learning Outcomes and Assessment Criteria. The student should also undertake a risk assessment in relation to the practical aspects of the research and might also consider any ethical issues which may be raised in terms of the research. It is also necessary for the student to evidence appropriate reflection and evaluation of the efficacy of their planning and execution of research (which could be assessed through the development of a series of tasks which when combined create a reflective log or journal in relation to the research.

The work required by the student to complete all of the tasks should be capable of being completed within 60 notional hours of learning for a double credit unit (see above).

Recommended Assessment Method (s)[1]:

Methodology	Insert √	Methodology	Insert √
Essay		Tutor Observation	√
Presentation	√	Experiment	√
Report / Mini-Dissertation / Extended Essay	√	Practical Demonstration	√
Exam		Other (provide details in additional details box)	√

Additional Details:

The completion of a research log or journal which includes a detailed research proposal; review of literature / annotated bibliography; statement of methodology and timetable could be used to evidence the meeting of key assessment criteria (this might also include the planning and preparation necessary for the final presentation of the work). This could be supplemented with individual analysis and evaluation of the key skills utilized in undertaking the research associated with consideration to how these might have been improved (*even better if*…). This further evaluation might be confirmed by tutor observation / discussion at supervision meetings or in relation to the experimental aspects of the work and recorded in this manner (contributing to the overall research log). This would leave the Report / Mini-Dissertation / Extended Essay aspects to focus on the knowledge based aspects of the research in more detail (although not necessarily to the exclusion of other skills based aspects) and would allow clear evidence to meet all the Learning Outcomes and Grading Descriptors allocated to the unit. However, the actual Report / Mini-Dissertation / Extended Essay must also conform to the technical demands in terms of language and presentation required for the presentation of academic research within the appropriate discipline. A presentation, practical demonstration or *viva voce* might be used to assess aspects of the research process if considered appropriate but this would not be integral as would be the case in terms of the extended IAS unit

[1] One or more of these methods may be employed in evidencing the Learning Outcomes and Assessment Criteria for the unit. However, please note that these methods do not preclude other means of evidencing Learning Outcomes and Assessment Criteria and are only **RECOMMENDED** means of assessment