2027L025C2EL

Coimisiún na Scrúduithe Stáit

State Examinations Commission

Leaving Certificate Examination 2027

Biology

Biology in Practice Investigation

Higher Level and Ordinary Level 200 marks

1. Information for candidates, teachers and school authority

The assessment of Leaving Certificate Biology comprises of two components:

1. Final written examination
2. Biology in Practice Investigation

The Biology in Practice Investigation is worth 200 marks, which is 40% of the overall marks for Leaving Certificate Biology. The remaining 300 marks (60%) are for the final written examination.

Coursework must be completed in full and strict compliance with the procedures and conditions outlined in this coursework brief and in the State Examinations Commission (SEC) Coursework Rules and Procedures.

The coursework must be carried out and submitted to the class teacher by 26th February 2027 and will then be submitted to the SEC (**Section 3**).

The authentication process

The authentication process is put in place by the SEC to ensure **the integrity of the examination process** and to ensure **fairness and inter-candidate equity**. The candidate, class teacher and school authority all have a responsibility to ensure that the ongoing preparation of coursework and that the work ultimately submitted to the SEC is the candidate's own individual authentic work. The SEC Coursework Rules and Procedures contains comprehensive information on the authentication process that must be read and adhered to.

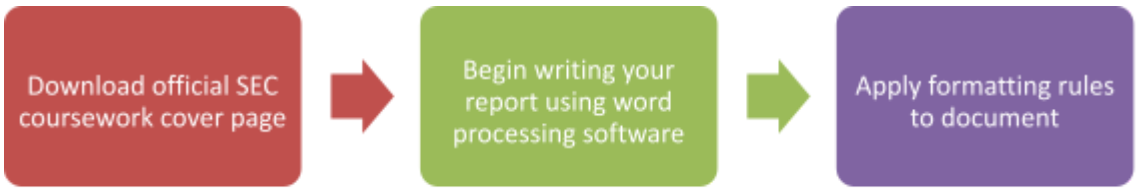
It is fully expected that candidates will carry out research as part of their coursework. To fully comply with these SEC Coursework Rules and Procedures, candidates must reference and acknowledge their research sources, including any use of AI, as outlined in **Appendices 1 and 2** of the SEC Coursework Rules and Procedures. To include material that is not created by the candidate and not properly referenced will be considered plagiarism. This is considered cheating. This is a breach of regulations and will be investigated by the SEC – see **Section 18** of the SEC Coursework Rules and Procedures. It is the responsibility of the candidate, the class teacher, and the school authority to ensure that the work being presented to the SEC is the candidate's individual authentic work.

This brief contains the subject specific information and requirements for the completion of the
Biology in Practice Investigation.

2. Creating your digital report

It is the responsibility of you, the candidate, to create and manage your digital document for completing the report. The SEC provide a cover page in Microsoft Word format (.docx) and this can be downloaded from: Examination Information - State Examinations Commission. You must complete the SEC cover page with all relevant information and it must be incorporated as the first page of your document. The SEC do not provide a submission booklet or template for the report so it is your responsibility to ensure that your report is structured and formatted according to the instructions in this brief (see **Sections 2**, **3** and **6** below).

The final version of the document must be converted to PDF format before it is submitted to the SEC. You may use any suitable word processing software to complete your report, provided that it has the functionality to convert the document to PDF format once completed. It is strongly recommended that you make and regularly update a backup copy of your digital report, which can be used in the event of loss or corruption.



Report formatting rules

The report you produce must adhere to the following formatting rules:

Section headings	Each section should be numbered and begin on a new page of the report. The heading should use the following font: Arial, black, font size 14 and bold. Refer to **Section 6** for section heading names.
Main body text	Arial, black, font size 12 with 1.5 line spacing.
Text editing features permitted	Bold, italics, numbering, and bullets.
Text editing features **not** permitted	Coloured text (black text only), highlighted text, different fonts (Arial only).
Page orientation	Portrait only.
Page numbering	Bottom-centre of each page.
Page margins **No work should appear in the margins as it may not be visible to an examiner.**	Left margin 20 mm Right margin 20 mm Top margin 20 mm Bottom margin 20 mm
Images, tables, graphs	Refer to **Section 4.**

A word count is prescribed for the report and this must be adhered to. If material is presented in excess of the prescribed word count you may lose marks.

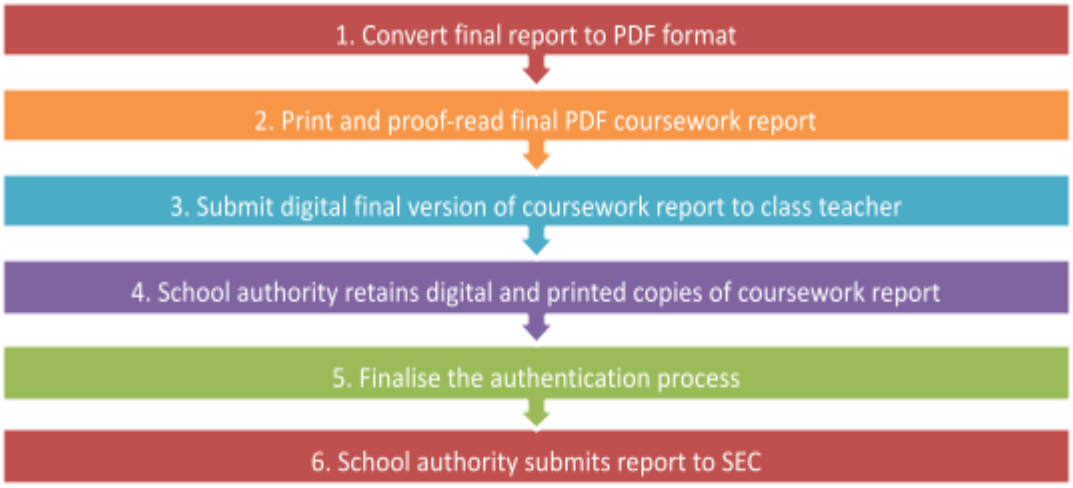
3. Submitting your coursework report

Once you have completed your report on or before the completion date you must adhere to the following steps:

1. Convert your report to PDF format. This facility is available in most word processing software.
2. Print the PDF version of your report and proof-read it to ensure that all of your work is visible. Any work that is not visible on this printed copy will likewise not be visible to examiners marking the work digitally and can therefore not gain any marks.
3. Once you are satisfied that the PDF copy of the report you have printed is complete, you should submit the digital version of the report to your class teacher. A Schools Portal circular issues from the SEC each year outlining how you should correctly name your PDF file and you can consult with your class teacher on how to do this.

4. A printed version of your final report and a digital copy of the report should be retained safely by the school authority until the appeals process has been completed.
5. You must finalise the authentication process to confirm that the coursework report being submitted is your own individual authentic work by signing the SEC Authentication Form P.2. This will be provided by your class teacher. Your class teacher and school principal will also sign this form to confirm that you adhered to the authentication process.
6. The school authority will submit your coursework through the Schools Portal. The SEC will issue a circular each year with specific information regarding those subjects whose coursework is submitted digitally through the Schools Portal.

Summary of steps in completing and submitting your coursework report



4. Engaging with your Biology in Practice Investigation

The brief for the Biology in Practice Investigation is designed to give you an opportunity to display evidence of your learning throughout your studies in Biology. When you have finished your investigation, you will submit a report on it to the SEC.

As you carry out your investigation, you are strongly encouraged to keep an investigative log. This can be used to keep a record of your thoughts on the investigation and reflect on how they change over time. It can also be used to keep a record of your research references and resources. Your log may be of use to you as you complete your investigation and your report.

You should **not** submit your log to the SEC.

Your Biology in Practice Investigation should involve the following six stages:

Stage 1: Initial Response to the Investigation Brief
Stage 2: Background Research
Stage 3: Designing and Planning the Experiment
Stage 4: Conducting the Experiment

Stage 5: Data Analysis and Conclusions
Stage 6: Finalising the Biology in Practice Investigation Report

The conducting of your experiment, and the gathering of your primary data, must be fully completed under the direct supervision of your Biology teacher, and in a relevant, safe and supervised setting (school laboratory and/or other suitable setting, as appropriate to the investigation).

For further and more detailed information on the Biology in Practice Investigation and Stages 1 – 6, see NCCA *Guidelines to support the Biology in Practice Investigation*.

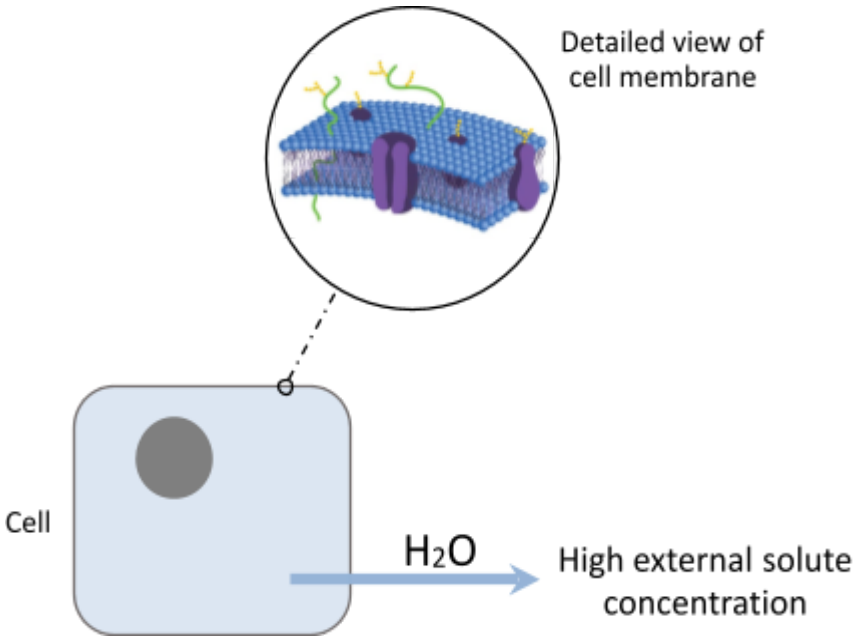
5. Topic for the Biology in Practice Investigation

Complete a Biology in Practice Investigation and report based on the following:

Membranes, Osmosis, Food Preservation

Cells have a selectively permeable plasma membrane which can control the movement of substances into and out of the cell. One important substance that moves into and out of cells is water.

Foods that have a high water content support microbial growth. This can lead to spoilage and decay. One method of food preservation involves the loss of water from microbial cells by osmosis. Preserving food by osmosis relies on placing food in solutions of high solute concentration, such as sugar syrups or salt brines.



There are many factors (temperature, concentration gradient, surface area, etc.) that affect the rate of osmosis. Knowledge and understanding of these factors and how they affect osmosis can help scientists extend food shelf life and improve food safety.

Investigate one or more aspects of this topic using the process described in **Section 4** of this document.

Acknowledgements:

Image: Cell membrane: shutterstock.com

6. Report structure for your Biology in Practice Investigation

Write your report using the following headings:

1. Title and Introduction
2. Background Research
3. Designing and Planning
4. Conducting the Experiment
5. Data and Data Analysis
6. Conclusions
7. References

Indicative content to be included in your report is detailed below along with mark allocation in **Section 7**.

Your report will be submitted digitally to the SEC for marking as outlined in **Section 3**.

Note that your report will gain marks for communicating clearly and with skilful brevity, but that fewer marks will be awarded if your report loses coherence through unwarranted length.

Your report should contain no more than **1500 words**. This word count does not include words used in references, in data tables, in formulae or equations, or as labels.

You may use appropriate images in your report to support your communication. Your report should contain no more than **20 images**. The number of images permissible should be seen as a limit and not a target.

Images should be inserted where appropriate and with due regard to effective and relevant communication. Images should not be used as a means to include additional text. It is advisable not to use images where a person or persons in these images may be identifiable. The inclusion of videos is not allowed.

Graphs, diagrams, images, etc. may be produced using appropriate software, captured from secondary sources, photographed directly, or hand-drawn. These can be embedded in your report as photographs or partial screenshots.

Mathematical and scientific formulae and equations may be produced using appropriate software or handwritten, photographed or scanned and embedded in your report. To ensure fairness across the different methods, formulae and equations, whether produced using software or handwritten and photographed, will not be counted toward the image limit.

7. Mark allocation

The table below indicates how marks will be allocated for the different types of content that may be present in your report, or for other criteria that may be reflected in your report.

Content / Criteria		Marks
A **Title and Introduction** **Background Research** **References**	• Title / Introduction / Research Question • Hypothesis • Background Research (Secondary Data) • Evaluation of Secondary Data • Referencing	**50**
B **Designing and Planning** **Conducting the Experiment**	• Experimental Design • Experimental Method • Safety • Fairness • Accuracy • Selection of Equipment	**50**
C **Data and Data Analysis** **Conclusions**	• Experimental Observations (Primary Data) • Data Presentation • Data Analysis • Conclusions	**50**

The criteria listed below are not distinct sections of your report, they should be evident throughout.

D **Scientific Literacy**	• Communication • Coherence • Relevance • Reflective Approach	**50**