Biology

HSC · 2017 SYLLABUS · STUDENT GUIDE

Where the marks are: HSC Biology 2027

What the eight HSC Biology papers from 2019 to 2026 show, and how to use it in your revision

51%
of all marks came from just **12 dot points**. They are Priority 1 and 2 in this guide.

2
long questions worth **7–9 marks** in every paper, most often Evaluate, Explain or Analyse.

67%
of marks came with a **graph, table or diagram**. Check what the question wants you to do with it.

24
marks in 2026 came from dot points that were **rarely the main focus** of a question before.

How to use this guide

1. **Start with Priority 1 and 2.** Try a past HSC question without notes. Tick the box when your answer matches the top band of the marking guideline.
2. **Use the dot-point codes** to find the full wording in the syllabus. Each row is a task to practise, not the whole dot point.
3. **Then Priority 3** on page 2, and the less familiar tasks on page 3. 2027 is the last paper on this syllabus.
4. **Mark what the question asked.** If it asks you to use data, check that you quoted values with units and said what they show.

Priority 1: examined in every paper

These nine dot points have been the main focus of a question in all eight papers.

	Dot point	Practise this	Papers
☐	**Inheritance patterns** M5.IQ4.DP2	Justify a genotype from relatives in a pedigree. Use a Punnett square with a key for sex-linked traits, incomplete dominance, codominance and multiple alleles.	**8/8**
☐	**Preventing the spread of disease** M7.IQ4.DP2	Explain how hygiene, quarantine, campaigns and pesticides prevent spread. Compare vaccination (active) with injected antibodies (passive immunity).	**8/8**
☐	**Infectious diseases and pathogens** M7.IQ1.DP1	Classify pathogens from their features. Explain how each is transmitted. Design a safe test of the microbes in water, with a control and repeats (2026 Q29).	**8/8**
☐	**Polypeptide synthesis** M5.IQ3.DP2	Describe transcription and translation, with the roles of mRNA and tRNA, and use a codon chart. Explain how genes and environment affect a trait (2020 Q20).	**8/8**
☐	**Technologies for disorders** M8.IQ5.DP2	Explain how dialysis replaces a kidney function. Use data on cochlear implants (2024 Q35). Compare LASIK with another technology for a visual disorder (2025 Q26).	**8/8**
☐	**Maintaining the internal environment** M8.IQ1.DP2	Explain adaptations in animals and how nerves and hormones coordinate responses. For plants, compare a waxy cuticle (a structure) with stomata closing (a response).	**8/8**
☐	**Types of mutation** M6.IQ1.DP2	Use a codon chart to work out what a substitution does. Explain why deleting three bases removes only one amino acid (2024 Q28b).	**8/8**
☐	**Causes and effects of non-infectious disease** M8.IQ2.DP1	Give the cause and effects of a named genetic disease, a disease from environmental exposure, a nutritional disease and a cancer.	**8/8**
☐	**Cell replication** M5.IQ2.DP1	Describe DNA replication, with each original strand acting as a template. Compare what happens to the chromosomes in mitosis and in meiosis.	**8/8**

Priority 2: examined in 7 of 8 papers

Each missed being the main focus of a question only once.

Dot point	Practise this	Papers
☐ **Reproduction** M5.IQ1.DP1	Compare internal and external fertilisation. Describe reproduction in plants, budding and spores in fungi, binary fission in bacteria, and binary fission and budding in protists.	**7/8**
☐ **Mutation, gene flow and genetic drift** M6.IQ1.DP6	Explain how mutation, natural selection, genetic drift and gene flow change a population's gene pool, using the data you are given (2022 Q32).	**7/8**
☐ **Negative feedback loops** M8.IQ1.DP1	Draw two separate loops: temperature (hypothalamus, nerves, sweating or shivering) and blood glucose (pancreas, insulin or glucagon). Show what triggers each response and how it returns to normal.	**7/8**

Priority 3: examined often

The rest of the top 20. Each was the main focus of a question in 3 to 6 of the 8 papers.

Dot point	Practise this	Papers
☐ **Uses and applications of biotechnology** M6.IQ2.DP1	Discuss the social and ethical issues of two named biotechnologies (2024 Q34), and how genetic techniques change biodiversity.	**4/8**
☐ **Evaluating an epidemiological study** M8.IQ3.DP3	Design the study in 2025 Q32: choose who to survey, explain why region C works as a control, and say what else you would record, such as diet.	**6/8**
☐ **Immune response after exposure** M7.IQ3.DP2	Start with inflammation and phagocytosis. Helper T cells activate B cells, which form plasma cells that release antibodies, and memory B cells. Cytotoxic T cells destroy infected cells.	**5/8**
☐ **Evaluating prevention of non-infectious disease** M8.IQ4.DP1	Explain how an education program reduces disease (2019 Q23). Evaluate a screening campaign from data (2022 Q27). Then evaluate genetic engineering as prevention.	**5/8**
☐ **Patterns of non-infectious disease** M8.IQ3.DP1	Know the difference between incidence (new cases), prevalence (existing cases) and mortality (deaths). Calculate a rate (2023 Q16) and compare groups in a graph (2024 Q11).	**6/8**
☐ **Fertilisation, implantation and pregnancy** M5.IQ1.DP2	Describe fertilisation and implantation, and what the hormones of pregnancy and birth do, reading their levels from a graph (2026 Q27b).	**5/8**
☐ **Modelling meiosis** M5.IQ4.DP1	Draw the gametes after crossing over (2024 Q33b). Then add fertilisation and a mutation to predict the genotypes of offspring.	**4/8**
☐ **Benefits of genetic technologies** M6.IQ3.DP5	Evaluate one use in farming, one in medicine and one in industry, such as making an enzyme for cheese. Give benefits, costs and a judgement.	**3/8**

Genetic technologies come up every year

Biotechnology and genetic technologies (Module 6) carried **7–18 marks in every paper**, spread over eight dot points. Practise two different kinds of question. In 2020 Q30 you choose the technologies. In 2026 Q26b the GM salmon is given, and the marks are for how social, economic and cultural factors shape public attitudes.

Skills to check in your answers

- **Using evidence.** Quote the comparison or feature that supports your point.
- **Designing a test.** Name the variables, a control, repeats and safety measures.
- **Plotting a graph.** Label axes and units. Add a key for two data sets (2021 Q25a) or a line of best fit if asked (2024 Q29a).
- **Calculating.** In 2024 Q29b, extend the line, read the percentage and show your calculation.

Don’t get caught out

watch this space

2027 is the last paper on this syllabus, and none of these has been examined in full. The papers have only asked part of each. We checked every question and marking guideline from 2019 to 2026.

Asked only in part	Practise this
☐ **Naturally occurring mutagens** M6.IQ1.DP1	UV light from the Sun has been examined. Prepare a second natural example: radiation from the decay of radon gas can break DNA strands.
☐ **Public health campaigns for an infectious disease** M7.IQ4.DP2	Evaluate a hand-washing campaign. Who is the message for? What would show it worked: more people washing their hands, fewer cases, or both?
☐ **Manipulating reproduction in agriculture** M5.IQ1.DP3	Compare using a few sires with crossing cattle breeds (2023 Q34). Judge the effect of each on yield and on genetic diversity.
☐ **Benefits of epidemiological studies** M8.IQ3.DP4	Use the smoking and lung cancer study in 2022 Q31a-ii. How does finding an association guide research? What else is needed to show cause?
☐ **Cell replication and the continuity of species** M5.IQ2.DP2	Explain how accurate DNA copying passes genes on, how meiosis and fertilisation keep chromosome number constant, and how variation helps a species survive change.
Asked only as recognition, or only in part	
☐ **Nutritional diseases** M8.IQ2.DP1	Explain how a lack of vitamin C causes scurvy and describe one effect. Then compare the age groups in the obesity data (2024 Q11).
☐ **Reproduction in bacteria and protists** M5.IQ1.DP1	Compare binary fission in bacteria with binary fission and budding in protists. Offspring are usually identical, but mutation can make them differ (2022 Q25).
☐ **Management and future research** M8.IQ3.DP2	Use 2020 Q30 to practise explaining how a disease is managed now. Then, for one non-infectious disease, suggest a question future research could answer.
☐ **Future directions of biotechnology** M6.IQ2.DP1	Suggest a new use of a biotechnology in wheat, the benefit it aims for and one concern (see 2023 Q18).
☐ **Structure and function of proteins** M5.IQ3.DP3	Explain how a change in amino acid sequence can change folding and function (2022 Q31b-ii). Know the four levels of structure. Only proteins with more than one polypeptide have quaternary structure.

What markers reward

- **Using all of the stimulus.** In 2022 Q27, the text mattered as well as the graph.
- **Being specific.** “Boil the water to kill the bacteria”, not “boil the water”. “Yeast”, not “fungi”.
- **Cause and effect.** Explain means how and why.
- **A judgement.** For Evaluate or Assess, weigh the evidence and say what you conclude. For Justify, give the evidence for your choice.
- **Every part answered.** If it says TWO or BOTH, give two or both.

Don’t mix these up

Markers have flagged each of these. Can you explain the difference?

- DNA replication vs polypeptide synthesis
- external fertilisation vs asexual reproduction
- chromosomes vs chromatids
- antibiotics vs antibodies
- prevention vs treatment
- somatic vs germ-line mutation
- active vs passive immunity
- gene flow vs genetic drift
- validity vs reliability vs accuracy
- hearing aids vs cochlear implants

A word of caution

These are patterns from past papers. Built from earlier papers only, this list’s top 15 covered 56 of the 100 marks in each 2022–26 paper on average, and only 39 in 2026. Don’t bank on a topic being “due”: one missing from the last paper came back less often (46%) than one that appeared (77%). Use this guide to decide what to do first, not what to skip.

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