AMSI AUSTRALIAN MATHEMATICAL SCIENCES INSTITUTE

aip AUSTRALIAN INSTITUTE OF PHYSICS

Year 12 Physics Participation Report Card

LONG-TERM DECLINES IN PHYSICS PARTICIPATION RATES AND SIGNIFICANT GENDER GAPS

Australian Mathematical Sciences Institute | Australian Institute of Physics
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Year 12 physics participation in Australia

KEY FINDINGS

- National Year 12 physics participation declined from 14.9% in 2015 to 12.1% in 2023.
- Since 2015, females have consistently comprised around one-quarter of Year 12 physics students, despite making up more than half of the Year 12 population.
- Between 2015 and 2023, the number of Year 12 students increased by nearly 12,000, yet the number of physics students declined by almost 5,000. This represents a decline of approximately 15% in the total number of Year 12 physics students.

INTRODUCTION

The Australian Mathematical Sciences Institute (AMSI) monitors national participation in key STEM subjects to better understand student pathways into science, technology, engineering and related fields. This report presents trends in Year 12 physics enrolments, offering a snapshot of how many students complete Year 12 with foundational knowledge in this critical discipline.

Physics is a cornerstone of STEM education. As noted by the Australian Institute of Physics, strong physics education is essential to support high-tech industries, advance physics-based research, and drive innovation across both emerging and traditional sectors.[1] It underpins a wide range of university degrees, including engineering, physical sciences, and emerging technologies, and helps develop critical analytical and problem-solving skills. It also prepares students to engage with complex global challenges such as sustainability, energy, artificial intelligence and materials innovation.

Year 12 physics education plays a vital role in shaping students' understanding of physics as a discipline, including its methods, principles, and broader value to society. However, fewer STEM degrees are listing physics as a formal prerequisite than in the past, a trend that may contribute to declining student enrolments in Year 12. A 2019 study of undergraduate courses found that many science degrees only required 'any' science subject as a pre-requisite for entry. Of the 1,587 courses examined, only 22 listed physics as a requirement.[2]

Between 2015 and 2023, the number of domestic students starting university decreased by 11%, from just over 260,000 to nearly 231,000.[3] In contrast, domestic commencements in undergraduate STEM degrees remained relatively stable, declining by only a few hundred students. In 2023, STEM degrees accounted for 37% of all commencing enrolments, with domestic students comprising 62% of the total STEM cohort.[3]

This sustained demand for STEM degrees underscores the need for strong science preparation at school. Yet there is a growing concern that students are entering tertiary programs without the background knowledge required to meet the academic rigour of university study and the demands of future careers.

Monitoring enrolment trends is essential to assess whether Australia is equipping enough students with the skills needed for its future STEM workforce. This report summarises national data from 2015 to 2023 and highlights key trends to inform educators, policymakers and the wider community about the state of senior secondary physics participation in Australia.

1 https://aip.org.au/SCIENCE-POLICIES
2 https://amsi.org.au/?publications=mapping-university-prerequisites-in-australia
3 https://www.education.gov.au/higher-education-statistics/student-data

HOW TO INTERPRET THE DATA

This report presents enrolment trends for Year 12 physics, reported at Level 3 and Level 4, which correspond to senior secondary qualifications in each state and territory. These levels generally align with the final year of school (Year 12) and are used to calculate students' ATAR scores for university entry.

The data includes students from all states and territories, including those undertaking the International Baccalaureate (IB). Each student is counted only once to avoid duplication, representing total enrolments in Physics at Level 3 and 4.

Participation rates are calculated as the proportion of the total Year 12 completing student cohort who enrolled in physics in their state or territory. This provides a clear picture of how many students finish high school with physics knowledge, supporting their preparation for further study in science, engineering and technology fields.

Students identifying as a gender other than male and female are not presented due to small numbers and risk of identification.

NATIONAL PARTICIPATION RATE

The number of Year 12 students enrolled in physics peaked at nearly 32,000 in 2015, before declining to just over 27,000 in 2023 (Table 1). Until 2019, annual enrolments consistently exceeded 30,000. However, following a sharp decline in 2019, enrolments have remained steady at around 26,000 to 27,000, despite continued growth in the overall Year 12 cohort.

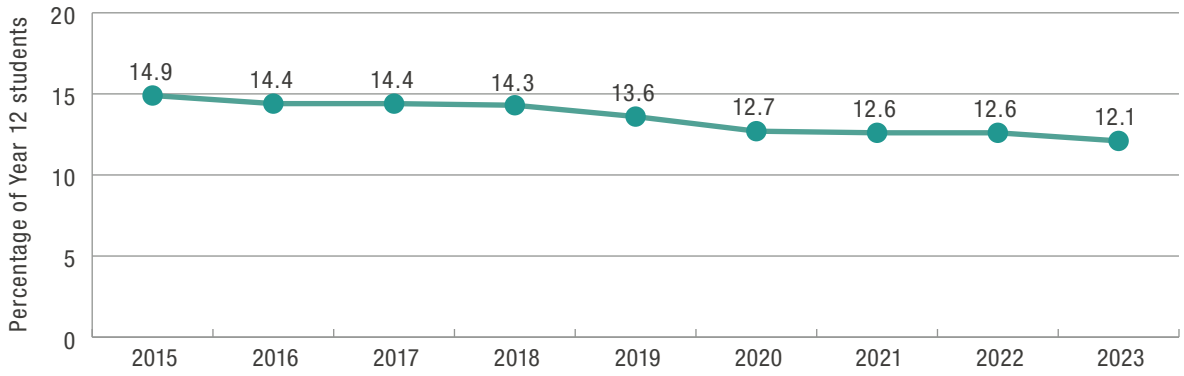
The national physics participation rate fell below 14% for the first time in 2019 and has remained between 12 and 13% in the years since (Table 1, Figure 1). In 2023, only 12.1% of Year 12 students studied physics.

These trends broadly reflect patterns observed in Year 12 advanced-level mathematics, where a notable decline in student numbers and participation also occurred in 2019.[4] While a smaller graduating cohort in one state contributed to the sharp decline that year, participation in both physics and mathematics has yet to recover.

Table 1. Number and proportion of students enrolled in Year 12 physics (2015–2023)

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cohort size	213659	214863	219500	217816	200863	212139	215554	210719	225355
# students	31933	30872	31688	31048	27252	26895	27081	26627	27212
% students	14.9%	14.4%	14.4%	14.3%	13.6%	12.7%	12.6%	12.6%	12.1%

Figure 1. National participation rate in physics (2015–2023)

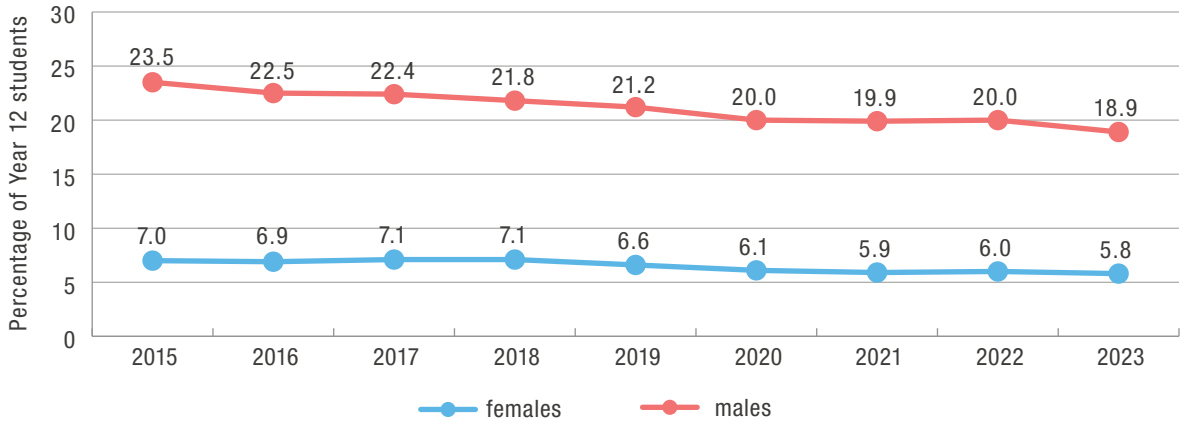


4 https://amsi.org.au/year12-participation-2025

PARTICIPATION BY GENDER

Between 2015 and 2023, participation in Year 12 physics declined for both male and female students. The male participation rate fell from 23.5% to 18.9%, while the female rate declined from 7.0% to 5.8% (Figure 2).

Figure 2. National participation rate in physics by gender (2015–2023)

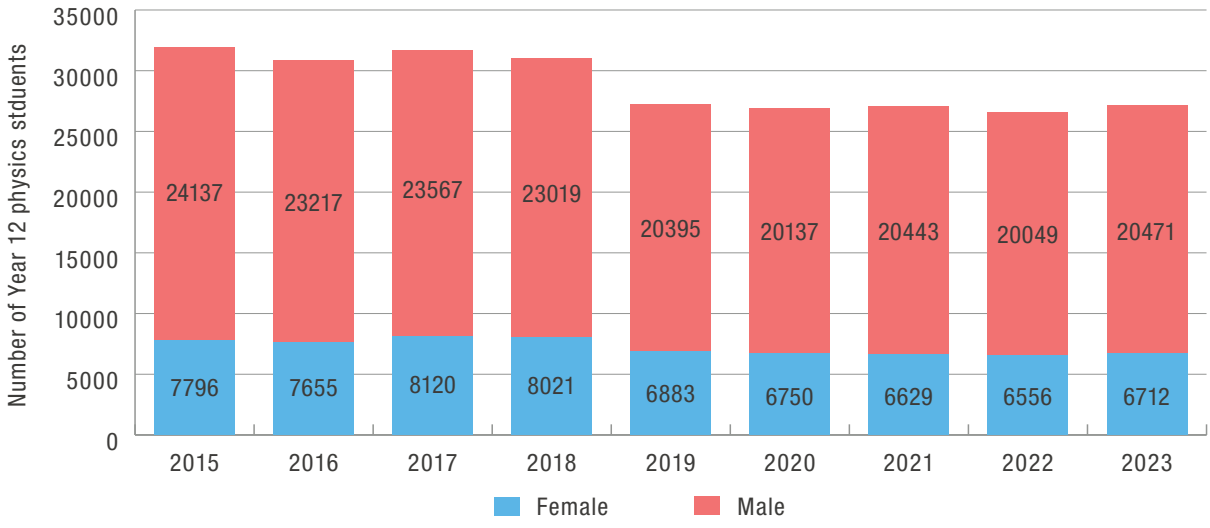


Female representation in physics remains significantly below parity. Since 2015, females have consistently made up around one-quarter of Year 12 physics students (Table 2, Figure 3), despite comprising more than half of the Year 12 cohort. Again, these trends mirror patterns observed in Year 12 advanced-level mathematics, where the gender gap has been approximately constant for over a decade.[5]

Table 2. Number and proportion of students enrolled in Year 12 physics (2015–2023)

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
Female	7796 (24.4%)	7655 (24.8%)	8120 (25.6%)	8021 (25.8%)	6883 (25.3%)	6750 (25.1%)	6629 (24.5%)	6556 (24.6%)	6712 (24.7%)
Male	24137 (75.6%)	23217 (75.2%)	23567 (74.4%)	23019 (74.1%)	20395 (74.8%)	20137 (74.9%)	20443 (75.5%)	20049 (75.3%)	20471 (75.2%)

Figure 3. Year 12 students enrolled in physics by gender (2015–2023)



5 https://amsi.org.au/year12-participation-2025

KEY TAKEAWAYS

- National participation in Year 12 physics has steadily declined since 2015 in both percentage terms and total student numbers, despite growth in the overall Year 12 cohort.
- The proportion of Year 12 students studying physics fell from 14.9% in 2015 to 12.1% in 2023, with enrolments dropping by nearly 5,000 over the same period.
- Females remain significantly underrepresented, consistently comprising only about one-quarter of Year 12 physics students.
- The decline in physics participation mirrors trends in higher-level mathematics, suggesting broader shifts in subject selection patterns, potentially influenced by changes to university prerequisites, perceived subject difficulty, and relevance.
- University enrolments in STEM degrees continue to grow, but fewer prerequisites in science and mathematics may be reducing the incentive for students to pursue foundational subjects like physics in Year 12.
- Physics education is critical to supporting Australia's high-tech industries, scientific research, and innovation capacity. The weakening pipeline from school to university poses long-term challenges for workforce readiness in STEM fields.

CONCLUSION

The ongoing decline in Year 12 physics participation highlights a critical challenge for Australia's STEM education pipeline and future workforce. While demand for STEM qualifications at the tertiary level continues to grow, fewer students are leaving school with the foundational physics knowledge required to meet this demand.

This trend is particularly concerning given the strategic role physics plays in advancing innovation across the science, engineering, and technology sectors. Physics not only supports high-tech and emerging industries but also plays a growing role in transforming traditional fields through technological advancement.

Reversing this decline will require closer attention to the factors shaping subject selection in senior secondary school, including the role of university prerequisites, and student perceptions of subject difficulty and relevance. Ensuring equitable access and representation, particularly for female students, is also essential to building a diverse and capable STEM workforce.

Sustained national monitoring, supported by targeted policy and education interventions, will be essential to restoring physics as a core discipline in senior secondary education, and strengthening Australia's long-term innovation and economic resilience.